EXPENDITURE REVIEW

of

PROGRAMMES

in the

POTATO SECTOR

DEPARTMENT OF AGRICULTURE AND FOOD

April 2004

CONTENTS

Introduction

The Expenditure Review Initiative (ERI) is a process of evaluation carried out by Government Departments as part of their annual business planning. The objective of expenditure reviews is to analyse in a systematic manner what is being achieved by Government spending and to provide a basis on which more informed decisions can be made on priorities within and between programmes. The potato sector was one of five programmes selected for examination under the ERI process in the Department of Agriculture and Food for 2002/2003.

The Terms of Reference for the potato review were drawn up in January 2003 and a Steering Group and Working Group established to carry out the review**.**

Terms of Reference

1. *Outline the scale and structure of the potato sector in Ireland and changes/developments which have taken place in the sector over the past 10 years.*
2. *Outline the measures operated by the Department of Agriculture and Food in the Potato Sector and define the basis and objectives of each of these measures and their relationship/compatability with the goals/strategies set out in the Department's Statement of Strategy 2003-2005.*
3. *Outline the outputs and outcomes accruing from the Department's activities in the Potato Sector and the trend of these outputs/outcomes.*
4. *Provide a detailed breakdown of the Department's resources employed in each of the above measures over the past ten years.*
5. *Evaluate the degree to which the objectives and the results achieved to-date warrant the allocation of public funding and resources on a current and ongoing basis and examine the scope for alternative policy or organisational approaches to achieving these objectives on a more efficient and /or effective basis. This evaluation will include:*
    - *Examination of the outputs from the Department's activities in the context of changes in the sector over the past ten years.*
    - *Consideration of alternative means of achieving the objectives, taking into account, where possible, the means used in other Member States.*
    - *Analysis of the possible outcomes, effectiveness and efficiency, including cost efficiency, of alternative methodologies.*
    - *Consideration of the effects of ceasing some or all of the current activities.*
6. *Make recommendations on the future operation and appropriate indicators for the Department's schemes and services in the potato sector.*

Members of the Steering Group

Jarlath Coleman (Chairman), Principal Officer, Crop Production and Safety Division
Michael Hickey (Senior Inspector), Horticulture and Plant Health Division
John Carvill (Senior Inspector), Seed Testing Division
Mark Winklemann (Analyst/Assistant Principal) Economics and Planning Division
Michael Kelly (Assistant Principal) Management Services Division

Members of the Working Group

Patricia Cannon (Assistant Principal) Crop Production and Safety Division
Sean Gaule (Agricultural Inspector) Seed Testing Division
Barry Delany (Agricultural Inspector) Horticulture and Plant Health Division

The fulfilment of the Terms of Reference required a detailed analysis of the potato sector: the scale of the industry and the changes which have taken place in it over the past decade; the programmes operated by the Department in support of the industry in that period; the

current relevance of these programmes; and what is the most appropriate way forward from a budgetary and policy perspective. The need to provide value for money is a key factor under the Departments Statement of Strategy (2003-2005). Under this Statement the Department '*is fully committed to the need to ensure value for money in the management of resources, the need to focus on services and outputs and the need to analyse and evaluate new and existing programmes'*. This expenditure review which comes under Strategy 5.9 in the Statement of Strategy fulfils that commitment in regard to the programmes in the potato sector. The schemes provided under this programme are as follows:

1. **Registration of Growers/Packers and Quality Standards**
2. **Plant Health Controls**
3. **Grant Assistance**
4. **Potato Variety Evaluation**
5. **Seed Production and Certification Services**
6. **Plant Breeders Rights**

The potato programmes operated by Teagasc and Bord Glas were also examined under the Review as there is considerable inter-linkage between the Department's schemes and those in the semi-state sector.

A wide range of reports and analyses of the potato sector and related issues were examined in the course of the review. Some of the more recent reports were of key importance to the study. These included the CEAS Report '*Irish Seed Potato Sector Review Study (October 1997),* the '*Expert Group Report on the Seed Potato Industry (2000)*' the '*Report of the Food Labelling Group (December 2002)',* and the report '*Costs and Benefits of Agriculture Research in Ireland (2002)'.* Information and reports provided by the Department of Agriculture and Rural Development in Northern Ireland, the Scottish Agricultural Science Agency, the Department of Environment, Food and Rural Affairs in Britain and the British Potato Council were also of considerable importance in the compilation of the report. A complete list of the reports examined by the Group is provided in Annex 1.

In the course of the Review the Group visited the Tops Centre and the Teagasc Potato Breeding Centre in Oakpark, Carlow. The Head of Research at the Teagasc, Oakpark Centre and the Senior Research Officer in Potato Breeding at the Centre were invited to the Department for further discussions with the Steering Group. The Chief Executive of Irish Potato Marketing also gave a presentation to the Steering Group and Working Group.

The potato industry makes an important contribution to the agriculture and national economy. The value of farm output was some €96m in 2002 with retail value estimated at €150m. The direct costs of state supports for the sector under the above measures amounted to over €4m in 2002. The capital costs associated with the schemes are additional to those costs.

In examining the continued use of public funding on the various schemes the key factors considered were the legal basis for such schemes, the contribution that they are making to the agriculture and food industry and to consumers, the cost efficiency which they are operated and the alternative means of achieving the same objectives. The need to take into account the wider policy environment affecting the Irish potato industry, including the recent changes brought about by the Mid Term Review of the Common Agricultural Policy, were also critical considerations. The need for the sector to continually adapt and adjust to the changes taking place in order that a viable competitive industry is maintained is critical. Apart from the legal responsibilities of the Department in the enforcement of EU and national law, the State's involvement in the potato sector was, accordingly, considered under the review on the basis of its contribution to the development of such a competitive industry.

April 2004

EXECUTIVE SUMMARY

Chapter 1

The scale and structure of the potato sector and changes over the decade.

EU policy environment

1. Since the reform of the Common Agricultural policy in 1992 the area sown to potatoes in Ireland has fallen from 6% to 4% of the total tillage area while the EU supported cereal and sugar sectors have remained stable. Current Irish potato output at 500,000 tonnes represents approximately 1% of EU production. Since 1992 the total area planted has fallen by over a half to around 13,500 hectares but due to increased productivity the fall in output has been less marked, with the scale of the reduction at about 25% over the period. In the UK, the area under potatoes has fallen by 12% over the decade with a decrease of 40% in Northern Ireland but an increase of 7% in Scotland. In The Netherlands the production area fell by 14% over the period.
2. The area sown for certified seed has fallen by 46% between 1992 and 2002 to approximately 1,500 hectares. The actual tonnage certified fell by 40% to a little over 10,000 tonnes. Ireland ranks below Northern Ireland in certified seed output (13,000 tonnes) and Scotland (288,000 tonnes).

Output and Value

3. Potato output, ex farmgate, was valued at €96m in 2002. Potato prices, which are very sensitive to supply and demand, are generally much higher than in Northern Ireland and Great Britain. In 2002 Irish potato prices were twice and three times dearer than in Northern Ireland and England/Wales, respectively, for both ware and seed.
4. The main market outlets for Irish potatoes are: direct to retail outlet, 10%; pre-packed washed potatoes, 32%; merchant/wholesale bags, 46%; and processing 12%. The washing of potatoes and pre-packing have been the major development over the decade with pre-packs now accounting for 95% of retail sales.

Consumption, supplies and storage

5. Most Irish potatoes are grown for the fresh ware market which is in the main controlled by six retail multiples who have about 65-70% of the sales. These multiples are supplied by five potato pre-packers who in turn are supplied by large specialist growers. One of the major developments over the decade has been the Bord Glas Quality Programme. All the pre-packers and 145 growers are participating in the programme. These growers represent 45% of the ware potato area in Ireland and the aim is to have some 200 growers, representing 80% of production, in the programme.
6. There has been significant growth in the processing and catering end of the market which has contributed to Ireland having the highest per capita consumption of potatoes in the EU.
7. There has been over €65m invested by growers in storage and other infrastructural facilities over the decade. This investment has been supported by approx. €20m in state grants. There is now in excess of 360,000 tonnes storage capacity of which 117,000 tonnes is refrigerated, most of the latter is in the hands of growers over 50 hectares. The construction of stores has enabled an all year round supply of quality potatoes and has been one of the critical developments in securing the future viability of the sector.

Imports and exports

8. Total imports of ware and processed potatoes for consumption in 2002 was 115,00 tonnes valued at €91.4m. This represented an increase of 30% in volume and 214% in value over 1992 levels. The increase in imports arose predominantly in processed potatoes which grew from 23,000 tonnes in 1992 to 71,000 tonnes in 2002 with the latter valued at over €76m. There was a reduction in ware potato imports from 65,000 tonnes to 44,000 tonnes over the period. Most of the ware imports were for the fresh chip market.

9. Exports of potatoes for consumption increased in value from €5m to €15m over the decade with processed potatoes accounting for 97% of this trade in 2002. Ware exports decreased from 9,000 tonnes to 1,500 tonnes between 1992 and 2002.

10. The fall in seed exports has continued over the decade and accelerated in the last five years: exports fell from 9,000 tonnes in 1996 to 3,000 tonnes in 2001 and 400 tonnes in 2002. Current exports are the lowest on record. On the other hand, seed exports from Scotland have continued to increase and in 2002 these exports (to third country markets) reached approximately 67,000 tonnes. These markets which were once supplied by Irish exports through Irish Potato Marketing Ltd have been replaced by Scottish exports where IPM relocated its base in the early 90's. In 2002 Irish bred varieties, for which IPM has exclusive rights accounted for a quarter of Scottish exports.

11. Imports of seed potatoes have continued to increase with CSO estimates at 15,500 tonnes in 2002. Bord Glas and DAF survey data give lower figures. DAF data for 2002 shows that some 25,500 tonnes of Irish seed was retained for planting the seed and ware crop in 2003. Total seed requirements for the Irish crop are estimated at 34,000 tonnes leaving a deficit of about 9,000 tonnes which is met by imports or other sources.

Structure of Sector

12. Total ware production has stabilised at around 13,500 hectares over the past three years. Small potato producers continue to exit the sector with number of growers falling by 53% over the decade to 832 growers in 2002. Production is now becoming increasingly concentrated in larger units with some 50 growers accounting for 45% of the area and 200 accounting for 79% of the production area.

13. The average area per holding with potatoes varies from 8Ha in the west to 22 ha in the east. **Leinster** accounts for half the potato growers and three quarters of the potato area with the average size of holding increasing from 14Ha to 22Ha over the decade. **Donegal** has experienced the highest contraction over the decade: it now has 10% of the area and 17% of the growers in the country, the latter having declined by 70% in the decade. The average size of holding has increased from 5 Ha to 10 Ha. **Munster** now has 13% of the area and 19% of the growers with some two-thirds concentrated in Cork. The average area sown has increased from 6.6 Ha to 9.5 Ha over the decade. **Connacht** has less than 7% of the growers and 2% of the area in the country. The average area has increased from 2.6 Ha to 4.3 Ha over the decade.

14. The certified seed area has declined by 50% to about 1500 Ha with growers declining by some 70% to the current level of 240 over the period. Donegal, Louth, Cork and Wexford account for 80% of the certified seed area in the country and 90% of the quantity certified in 2002. Donegal accounts for about 42% of the certified area in the country and about half of the quantity certified. The data also shows that: half the seed potato growers in the country are under 3 Ha and produce about 1500 tonnes of certified seed or an average of 12 tonnes each; over half the seed certified in 2001 was produced by 16 growers all of whom had over 20 Ha sown.

Varieties

15. Over the decade potato growers have adopted a more market oriented approach towards the selection of varieties for the ware market. Four varieties-Rooster, Kerrs Pink, British Queen, Records- account for about three quarters of the market with the remainder mainly comprised of processing varieties for chips and speciality potato products.

16. The most significant development with regard to varieties since 1992 has been the launch of Rooster on the Irish market. Rooster which is a Teagasc bred variety, now commands over 32% of the market is now the variety most favoured by Irish consumers.
17. The breeding of new potato varieties in Ireland is carried out at the Teagasc Oakpark Research Centre in Carlow. Since the early 60's some 30 varieties have been bred by Teagasc of which 15 are grown commercially in either Ireland or the UK. In 2002 Teagasc bred varieties comprised 32% of the ware area grown in Ireland and 18% of the seed area. In the UK, the figures were 2% and 9% of the ware and seed area, respectively.

Chapter 2

Programmes operated by the Department of Agriculture and Food in the potato sector and their relationship with the sector and the changes which have taken place in the sector.

18. There are six programmes administered by the Department in the potato sector. In addition, Bord Glas carry out programmes in market development and promotion while Teagasc carry out research and advisory programmes. The State Laboratory also provides testing and diagnostic services in support of the Department's plant health programme. The total staff and operational costs of all the potato programmes in 2002 was approximately €4m.
19. The Department's programmes are carried out by 78 officers located in four Divisions which come under the Chief Inspector. Approximately 58% of staff time is spent on potato duties which breaks down to a total 45 Man-Work-Units. The staff breakdown is as follows: 15 Inspectorate, 47 Technical, 10 Industrial grade and 6 administrative. The regional distribution is as follows: Donegal 27, Maynooth/Backweston 24, Rest of Leinster 13, Connacht 6, Munster 8.
20. The non-staff resources used in the potato programmes are the Tops Potato Centre in Donegal and the Backweston Station.

Registration and Standards

21. There are no EU quality standards set down for potatoes. In Ireland quality standards are governed by national legislation as set down in the Food Standards (Potatoes) Regulations 1977. Similarly, national legislation also governs the regulation of potato growers and packers under the Registration of Growers and Packers Act 1984. Under the latter legislation all growers and packers are required to be registered with the Department and keep records to ensure full traceability of potatoes grown and traded. In 2001 the Act was amended to provide additional information for seed potatoes acquired for planting.
21. Officers of the Horticulture and Plant Health Division are responsible for carrying out inspections to check compliance with the registration and quality standards in wholesale and retail premises. These inspections are carried out in conjunction with the quality standards for fruit and vegetables which are governed by EU legislation. In 2002 a total of 2286 visits were made by the thirteen technical staff (SAOs) in the Horticulture and Plant Health Division to 2214 retail premises. During these visits 1610 inspections were carried out on potatoes and 2286 inspections on fruit and vegetables. A total of 1797 visits were made to 211 wholesale premises during which 808 inspections were made on potatoes and 1584 on fruit and vegetables. The estimated costs of carrying out the above potato inspections and the associated back-up management/ administrative costs was €158,000 or 11% of the total costs for the staff involved in 2002.
22. Officers of the Seed Certification Division also carry out potato inspections under these national regulations at farm level. In 2002, 1399 such inspections were carried out at an estimated cost of €44,600.

23. In evaluating the above programme it is considered that the 2418 inspections of retail and wholesale premises in 2002 is disproportionate to the possible level of breaches of the regulations or the seriousness of these breaches. The inspections are not risk based: there is an average inspection intensity of four inspection per wholesale premise and 0.73 inspections per retail premise per year. The inspection intensity varies between counties/ regions with an extreme of 30 inspections per wholesale premise recorded in 2002. While the number of defective potato samples detected under the quality standards regulations over the period 1997-2002 was of the order of 13% and 16% for wholesale and retail premises, respectively, none of them were so serious to warrant prosecution.
24. The analysis also indicates that the programmes have operated independently of the changes which have taken place in the sector over the decade. The five main multiple retailers now control up to 70% of supplies and source their potatoes from five large wholesalers/pre-packers. These developments have been accompanied by Quality Assurance Schemes to meet consumer demands for higher and higher standards of food safety and traceability. Membership of the Bord Glas Quality Programme, which has been developed over the past 10 years, is now a basic requirement for growers supplying the multiples. Currently the scheme is subscribed to by 145 growers who produce 45% of the national ware crop with the aim to have the 200 growers who produce 80% of the potato crop registered in the next few years. The standards in the Bord Glas programme are based on legislative, best practice and market requirements. Each participating grower and wholesaler/pre-packer undergoes two independent audits by Bord Glas appointed auditors each year.
25. The *Food Labelling Report* identified a number of weaknesses in the policy and enforcement of labelling legislation. One of the main weaknesses related to the lack of cohesion between the enforcement agencies in food labelling inspections, thereby leading to possible overlap and the inefficient use of resources. For example Environmental Health Officers carried out about 38,000 inspections of retail premises in 2001, while in the same year DAF officers also carried out 1310 inspections of potatoes in retail premises in addition to those of fruit and vegetables (and other products) in the course of their 2300 visits to such premises. The Minister for Agriculture and Food has accepted the recommendations of the Report that the FSAI should be responsible for the enforcement of all food labelling and to this end all labelling legislation under the policy remit of the Department is being added to the Schedule of legislation in the FSAI Act. This includes the Food Standards (Potatoes) Regulations and, accordingly, the inspections for compliance with the labelling aspect of this regulation will be decided by the FSAI and DAF.
26. Accordingly, the labelling legislation related to potatoes, fruit and vegetables will be included in the Service Contract with the FSAI. This will provide for the rationalisation of the service and the operation of a risk based inspection programme. The participation of growers and wholesalers/packers in the Bord Glas Quality Programme will be a significant factor in determining risk and the number of inspections required under the regulations. All inspections under these regulations should be carried out by the Horticulture and Plant Health Division.
27. The outcome of this will be more efficient use of staff and resources and the development of synergies between the inspection agencies.

Plant Health Controls

28. Plant health controls in the potato sector, as is the case for all plant health controls, are governed by EU Regulations which are applicable in the whole Community. These regulations provide protection against the introduction of harmful organisms into the country such as Ring Rot and Brown Rot, and the control of Potato Cyst Eelworm and Wart disease. In addition, there are some pieces of National legislation in place such as the Colorado Beetle Order 1945, the Potato Root Eelworm Order 1951 and the Black Scab (Special Area) Order 1933-1948. This legislation is enforced by means of surveys, plant examinations, sampling and testing.
29. Officers of the Horticulture and Plant Health Division are primarily responsible for enforcement of the above legislation (Officers of the Seed Certification Division also

carry out certain functions in the course of their duties- see Seed Certification Services). In 2002, some 1000 inspections were carried out for the presence of Colorado Beetle during which 3 insects were found and destroyed. These inspections mainly take place at wholesale marketing centres and retail premises in conjunction with the inspections for the quality standards outlined in the previous section. In 2002, officers also took 418 samples for testing in the State Laboratory for the presence of pathogens (brown rot, ring rot, PCN, Beet Necrotic Yellow Vein virus) in water samples and imported potatoes.

30. The total costs for the 20 inspectorate staff involved in the enforcement of the plant health controls in potatoes in 2002 is estimated at €119,000 or 9% of the total costs of such staff. Additional administrative costs bring the total costs to €127,000. The analysis of samples is carried out free of charge by the State Laboratory

31. In the evaluation of the above programme, the EU Regulatory obligations and the need to retain the country's high health status are primary considerations. The service provided by the Horticulture and Plant Health Division for potatoes is part of their overall plant health work and represents only a minor but essential part of such work. The estimated costs involved (€119,000) are relatively small compared to the costs of the plant health services provided under the Seed Certification Division. These services cost €450,000 (staff costs of €291,000 and analytical costs of €160,000).

Grant Assistance

32. Over the period 1992 – 2002 grant aid of €19.8 million in public funds was given to the potato sector towards investment in facilities for the production, storage and marketing of ware and seed potatoes. These grants were paid out under two schemes: €13.62m under the EU FEOGA grant aid scheme for marketing and processing; and €6.2m for on-farm storage and ancillary equipment under the National Development Plan (2000-2006) and its precursor, the Operational Programme for Rural Development (1992-2000). The total exchequer funding involved in both schemes was €10.07m.

33. The administration of the FEOGA scheme is undertaken by Food Division with the NDP farm investment scheme administered by Crop Production and Safety Division. Technical input to both schemes is provided by Horticulture and Plant Health Division. The staff costs associated with these grant aid schemes are estimated at approximately €43,000.

34. These grant aid schemes have made a vital contribution to the modernisation of the potato industry at producer and processing levels. As already outlined these grants have primed investments of over €65m in storage and infrastructural facilities over the decade. There is now in excess of 360,000 tonnes of storage capacity of which 117,000 tonnes is refrigerated. The construction of stores has enabled an all year round supply of quality potatoes, thereby putting the future viability of the ware potato sector on a more secure footing. Without this investment it is likely that only the very large growers would survive and ultimately there would be more dependency on imports. Ware potato imports over the decade have stabilised at about 50,000 tonnes per year, most of which are imported for the fresh chip market.

35. A consultants study of capital investment grant schemes in the potato and horticulture sectors was carried out on behalf of Bord Glas in 2002. The review concluded that capital grant schemes have made a very important contribution to the development of the sector but additional public funding should be provided and that processed potato products should also come under the scope of the grant programme. One of the most significant developments in the sector has been the growth of value added products with exports increasing from €3.5m in 1992 to €15m in 2002. Imports of processed potato products (mainly frozen chips) over the same period increased from €17m to €77m.

36. In light of the above evaluation it is considered that capital grants should continue to be provided for the sector with priority given to projects involved in value added products. Administration of the grower and packer based schemes should continue to be carried out by the Department of Agriculture and Food. Because of the relatively

small costs incurred in administering the schemes, there would be little or no savings in transferring them to another agency. The Department would still have to retain a policy role and the associated expertise required.

Potato Variety Evaluation Programme

38. The main objective of the Potato Variety Evaluation Programme is to examine the value for cultivation and use (VCU) of potato varieties with regard to yield, quality, disease and other agronomic traits and to establish and recommend the most suitable varieties for growing under Irish conditions.

39. The legal basis for the programme flows from Council Directive 2002/53/EC under which all member states are obliged to compile a national catalogue of varieties accepted for certification and marketing in their own territories. The varieties entered into the catalogue must be trialled for two years and shown to be distinct, stable and uniform (DUS) and of satisfactory value for cultivation and use (VCU). Once a variety is accepted into a National Catalogue, it can be entered into the EU Common Catalogue and its seed can then be freely marketable within the Community.

40. In addition to trialling varieties over two years for entry to the National Catalogue, the Department also carries out trials for a further year for entry to the Recommended List. This latter is not a requirement of the EU Directive but it provides important information for growers in assessing commercially suitable varieties. Selection of varieties for the National list and Evaluation List is made by an Advisory Committee comprised of Department officials, growers' representatives and research institutions. Grower uptake from this recommended list is estimated at 80%.

41. The potato variety evaluation scheme is carried out by the Plant Variety Testing Division over five centres - Backweston, Moorepark, Dublin, Meath and Donegal. The total technical staff costs associated with the scheme in 2002 were estimated at €130,000 or 40% of the 10 staff involved. The additional administrative support provided by the Crop Production and Safety Division brings the total costs to €138,000. The operational costs associated with the scheme, are estimated at €15,000. Capital costs of the facilities at Backweston are in addition to these costs.

42. Between 1992-2002, a total of 79 different potato varieties were trialled varying from 31 in 1992 to 16 in 2002. Eight of the varieties trialled in 2002 were bred by Teagasc and 8 were of foreign origin. All of the foreign varieties and two of the Teagasc varieties were on the EU Common Catalogue.

43. Of the 79 varieties trialled over the period of the review, 30 were grown commercially and the remaining 49 varieties did not meet VCU criteria and were not grown. Of the 30 varieties that were grown, 6 varieties were long established ones used as controls and accounted for approximately 64% of the area planted to the ware crop; two varieties Rooster and Cara, which were bred by Teagasc accounted for 16% of the area sown; four processing varieties contributed 9%; and the remaining 18 varieties contributed 10% to the area sown in the period.

44. There are very few new main-crop varieties coming on stream with ware production concentrated in four varieties- Rooster (31%), Kerrs Pink (25%) Record (6%) and British Queen (11%)- which apart from Rooster have been long established in Ireland. Processing varieties have increased in importance in recent years and the trialling of these under the programme mirrors this development.

45. In regard to the 17 Teagasc bred varieties which have been evaluated under the programme over the period, only two of these varieties, Rooster and Cara, were propagated under the seed certification scheme and grown for ware production in Ireland in 2002; the 15 other varieties are propagated in the UK or elsewhere.

46. National List Trialling in the UK is the responsibility of DEFRA and is carried out on its behalf by NIAB (National Institute of Agricultural Botany) and SAC (Scottish Agricultural College). Breeders pay Stg£1000 for each variety trialled. There is no National List trialling carried out in Northern Ireland but DARD carry out and fund two Recommended List trials each year. In Great Britain, Recommended List trialling

is carried out by NIAB and SAC and funded by the British Potato Council who in turn are funded by a growers levy.

47. All potato trialling in Ireland is carried out free of charge. There is a charge for such services in most of the larger EU countries. Charging potato breeders to have a variety trialled (say €1,000 per variety) would, in the context of the trial plans for 2004, bring in very little income and would most likely fall as a cost to be borne mainly by Teagasc.

48. In examining the future direction of the programme the following considerations emerge: as there is no obligation to evaluate varieties for entry to the Irish National List if they are already on the EU Common Catalogue, a more selective approach should be adopted regarding the varieties which should be trialled with only those showing strong commercial merit evaluated; breeders/agents should be charged for the evaluation of their variety; the scheme could be integrated into the Teagasc research programme as most of the varieties being evaluated are bred by Teagasc and cost recovery could be built into the IPM contract; there is a precedent for private sector involvement in variety evaluation as in the case of sugar beet where the trialling is carried out by the Sugar Company under the supervision of the Department; as most of the potatoes produced in the island of Ireland are grown in the north-eastern part of the country, there is scope for close co-operation between both jurisdictions in evaluating the most suitable varieties for the whole country.

49. In view of the potential conflict of interest that could arise if the scheme was transferred to Teagasc (Teagasc would be evaluating its own varieties) and the likelihood that a full recovery of costs could have a negative impact on the sector, it is considered that the Department should continue to operate the scheme. Because the potato variety evaluation scheme represents only a small percentage of the costs of the plant variety evaluation programmes in DAF, involving the same staff, the economies gained from its discontinuation or transfer would be limited. Accordingly, a more commercially focused scheme with appropriate charges should be put in place and co-operation with Northern Ireland explored.

Seed Production and Certification

The Tops Centre

50. The availability of seed potatoes of the highest quality is essential for the national potato crop from both a phytosanitary and economic perspective. Potatoes differ from most conventional seeds such as cereals, sugar beet, etc, in that they are vegetatively propagated and, accordingly, prone to accumulating pests and diseases with each subsequent propagation which lead to tuber degeneration. Genetic variation can also give rise to off-types which must be removed from the start of the propagating pyramid. The Tops centre on a 80 Hectare farm with laboratories and glasshouses was established by the Department in 1972 to produce these early generation (pre-basic) disease free potatoes. Prior to 1972 pre-basic seed the Department produced Pre-Basic seed on rented land but due to difficulties in acquiring suitable land it was decided to purchase and establish the Tops centre

51. The process in Tops involves the selection of superior clones and their regeneration through meristem tip cuttings (sprouts) and in-vitro regeneration to produce microplants. These microplants are planted in the glasshouse to produce minitubers which in turn are planted in the field to produce the first generation Pre-Basic 1 seed. This seed is propagated further the following year to produce Pre-Basic 2 seed. Pre-Basic 2 seed is sold on to growers for further propagation under the seed certification scheme which provides the seed for the ware potato crop. Other activities carried out at Tops include the maintenance of the national collection of potato varieties, the characterisation/ DUS testing of new varieties and the provision of a diagnostic service for common potato virus diseases. Since 2002, Tops is also responsible for the management and supervision of the Foundation seed Certification Class.

52. The quantity of pre-basic seed produced each year in Tops between 1992 and 2002 was approximately 80 tonnes but because of the very high standards required for tuber multiplication under the seed certification scheme, approximately 38% on average was rejected each year leading to about 50 tonnes being available for sale to Foundation seed producers. In the late1980s and early 1990s severe virus infections were encountered with the result that some varieties were not available, or of limited availability, for the certified seed and commercial ware sector. At that time An Bord Glas introduced a minituber programme under which two private operators produced minitubers in glasshouses which were then sold, with the aid of a Bord Glas subsidy, to 14 growers throughout the country for the production of pre-basic seed. Over the period of the scheme between 1992 and 1999, when the scheme ceased, some 661 tonnes of pre-basic seed was produced and met 65% of the seed requirements for the Foundation seed crop (the next generation) with the balance coming from the Tops Centre. The average subsidy per tonne of pre-basic seed produced under this Bord Glas programme was € 428.
53. Since 2000 Tops has provided all the pre-basic seed needs for Foundation growers under the seed certification scheme. The quantity sold from Tops was 47 tonnes, 57 tonnes and 27 tonnes for 2000, 2001 and 2002, respectively. As pre-basic seed is the primary source of most of the ware crop grown in Ireland and is provided to growers at a price which is less than 10% of its cost, the degree to which it is propagated is therefore a key determinant in the effectiveness of the scheme and the maximisation of its contribution to the Irish potato industry.
54. A tracking of the 57 tonnes of pre-basic seed sold from Tops in 2001 shows there is leakage in the multiplication system with less than a third of potential seed output being achieved. There are substantial quantities of early generation material by-passing the multiplication system and going directly for ware production.
55. In addition to the sale of pre-basic seed, Tops also sells about 150 microplants each year to private minituber producers, mainly for breeding research in other member states. The price charged for pre-basic seed in 2002 was €635/tonne and microplants were charged at €0.75/plant. Other outputs in 2002 were the testing of about 4,800 potato samples for viruses and the testing of 43 samples for residues.
56. The staff costs associated with the Tops schemes in 2002 was €576,000. The operational costs were €226,000 but when receipts from sales are deducted the net operational costs amounted to €75,000. Capital costs and depreciating charges are extra.
57. While there are a number of activities carried out at Tops, its primary purpose is the production of pre-basic seed. On the assumption that this activity is responsible for a minimum of 50% of the costs then the state subsidy is around €5000 per tonne of pre-basic seed compared to a subsidy of €428 per tonne under the Bord Glas scheme. The inclusion of capital costs at Tops would inflate this figure further.
58. There is major variation between varieties regarding their degree of propagation. The 57 tonnes of pre-basic seed sold from Tops in 2001 comprised of 26 varieties: 10 varieties (representing 41 tonnes of Pre-Basic 2 seed) made up 94% of the certified seed area and almost all of the ware area; nine varieties (representing 8 tonnes of Pre-Basic 2 seed output) made up 16 ha (6%) of the certified seed area and 30 hectares of the ware area and seven varieties (representing 8 tonnes of Pre-Basic2) were not propagated at all for either seed or ware in Ireland.
59. *Protected* varieties, i.e. varieties protected by Plant Variety Rights, are twice as efficiently propagated as *free* varieties. If all varieties were similarly propagated as Rooster, a *protected* variety, the total Pre-Basic 2 seed requirements for the national ware crop (13,000 Ha) would be only about 13 tonnes per annum.
60. In Scotland and Northern Ireland there is very limited state involvement in the production of minitubers or pre-basic seed other than in inspection and control of standards. In both jurisdictions the state holds the virus free germplasm which is then propagated by private companies and sold to growers to produce Pre-Basic seed. Approximately, four hectares of Pre-Basic seed is grown by producers in Northern Ireland. (A similar area is grown on the 80 Hectare Tops farm). The varieties and

quantities of pre-basic seed required are determined by the market place and are mostly subject to contractual agreements.

61. IPM have cited disease problems with Tops seed as one of the reasons for transferring their seed propagation and export operations to Scotland. However, EU Comparative Trial data shows that Irish seed compares favourably with other north European countries with regard to potato diseases.

62. The involvement of the state in the production of pre-basic seed material has hindered the entry of private operators into this segment of the market. There are no strong market signals to determine the quantities and varieties of seed required and as the seed is sold at a fraction of its cost of production there is inefficiency in the multiplication process. The Bord Glas minituber scheme has shown that pre-basic seed could be carried out in the private sector at a fraction of the costs at Tops.

63. Following from the above the role of the state should be in providing the mother tubers or germplasm for propagation by the private sector as in Northern Ireland and Scotland. In Ireland both Tops and Oakpark hold such stocks of germplasm. Due to the relatively small scale of the seed potato industry in Ireland and the need to fully exploit the state's potato research programmes and facilities, the concentration of all the State's potato activities in one centre would be justified.

Seed Certification Scheme

64. The primary objective of the Seed potato Certification Scheme is to certify that potatoes grown from approved seed are true to name and conform to health standards prescribed under EU and national legislation. As outlined in the previous section potatoes degenerate with each subsequent propagation due to viral and other pests and diseases and there is accordingly a deterioration in yield. In an unregulated environment, pests and diseases are also spread more rapidly thereby damaging the plant health status of the country. The marketing of seed potatoes is regulated by EU Council Directive 2002/56/EC which sets out minimum conditions for seed potato production and their marketing and labelling within the Community. As Ireland is a High Grade Seed area only certified basic or pre-basic seed may be marketed in the state or imported into the state. The Department of Agriculture and Food is the certifying authority in Ireland, but the Minister may appoint another body to carry out this work.

65. In addition to carrying out seed certification duties, officers of the Department's Seed Certification Division also carry out other functions relating to plant health, the enforcement of the registration and quality standards regulations and the provision of market intelligence.

66. Certification duties involve the processing of applications from growers, the inspection of sites, testing for potato cyst eelworm, inspections during the growing season and finally sealing/labelling the certified seed for marketing. Since 2002 officers have also responsibility for inspecting ware crops sown to certified seed from which growers intend to retain home saved seed for their own use. This home saved seed is called Class X and can only be grown for one generation and cannot be marketed under plant health legislation.

67. Since 1992 the certified area has fallen by 50% to 1539 hectares in 2002. The quantity of potatoes sealed and labelled has fallen from 17,383 tonnes to 10,358 tonnes over the same period. The fall off in the certified seed area has been 'compensated' by the Class X area which amounted to 1132 hectares in 2002 most of which (70%) is grown by 44 ware producers in the north east of the country. Class X seed is not a certified class and cannot be marketed.

68. The key measure of productivity in the seed certification scheme is the weight of potatoes certified per hectare. Historically, productivity has been low compared to international levels with producers in effect operating a dual cropping system with seed being in effect a by-product of the ware crop. This has led to average seed outputs in the past 50 years of less than 9 tonnes per hectare compared to levels of 25 to 30 tonnes in Scotland and The Netherlands, respectively. In 2002, the average certified seed output per hectare in Ireland was 6.7 tonnes varying from 3.8 tonnes

for Kerrs Pink to 15.7 tonnes for Rooster out of a total yield of approximately 27 and 34 tonnes, respectively, for these two varieties. The reason for the low certification rate for *free* varieties such as Kerrs Pink is primarily due to the fact that these are grown on a spot market basis without any contractual arrangements. Accordingly, growers protect their income and investments by bulking up the yield by delaying harvesting and selling most of the crop for ware. The availability of contracts for *protected* varieties such as Rooster results in a much higher output of seed per hectare. If Scottish levels of productivity were achieved for Kerrs Pink then the total area required to produce the 2767 tonnes of Kerrs Pink certified in 2002 would be 110 hectares rather than the 724 hectares grown. The provision of a free certification service by the Department has been a major contributory factor to the low levels of productivity.

69. The total cost of the seed certification service in 2002 was over €1.35m which represents an average cost of €5160 per grower, €130 per tonne of seed certified or €898 per hectare of land used for growing the certified crop. The inclusion of the Tops facility, which is an inherent element of the certification programme, brings the total costs to over €2m.

70. Technical staff costs are the major costs of the seed certification service. The core seed certification work of the 26 staff involved costs €1.01m. The technical staff costs per hectare of land certified varies from €65 in the east to €190 in the west. There is also considerable variation within regions. Because of an imbalance in the workload between regions some technical officers are transferred from Donegal to the eastern region to carry out seed certification duties and others are transferred to other schemes such as biosecurity duties. The cost of the non-potato duties are estimated at €0.44m for the 2.84 Man- Work-Units involved. This represents a cost of over €150,000 per MWU.

71. The non-staff costs of the seed certification service amounted to €190,000 in 2002. Some €160,000 of this was paid to Teagasc for carrying out examinations for the presence of Potato Cyst Nematode (PCN) in potato and soil samples sent in by seed certification staff.

72. All seed certification services are provided free of charge by the Department while in the case of Northern Ireland and Scotland such services are provided on a cost recovery basis. Crop inspection fees of €47 per hectare and over €6.00 per tonne for tuber inspection/ sealing and labelling are charged by the Department in Northern Ireland. In Scotland crop inspection fees of €82 per hectare are charged and €4.25 per tonne for sealing and labelling. Marketing/promotion levies are also charged in Northern Ireland and Great Britain. In Northern Ireland a levy of €7.10 per half hectare of seed potatoes and €1.28 per tonne of certified seed potatoes for export is collected by the Seed Potato Liaison Group for the promotion and marketing of seed potatoes. In GB the British Potato Council collects an area based levy from growers and a tonnage based levy for potato purchases each time they move through the supply chain. The funds from these levies, *inter alia*, assist the industry in increasing market share of seed potatoes and the development of export markets.

73. The weaknesses in the Irish seed potato sector have been identified in previous reports. These relate in particular to the small scale of operations, the lack of specialisation, the absence of vertical linkages and contract arrangements between seed and ware growers. These weaknesses have contributed to the fall off in seed production, the demise of the Irish export market and the increasing penetration of imports. The introduction of fees that are market cost related would assist in retaining the committed seed grower and the development of a commercial seed production sector.

74. The charging for services will require a major rationalisation of the scheme if full cost recovery is to be achieved. A breakdown of the work of technical staff shows that 57% of their time is on core certification activities, 26% of their time on plant health controls, 13% on market intelligence, surveys, etc and 5% of the time on the enforcement of registration and standards. Currently, each of the 20 Technical Agricultural Officers has an average of 77 hectares (adjusted to 90 hectares when

other non-potato work is taken into account) of certified seed area compared to approximately 160 hectares in the 1980s. With streamlining of work, particularly in relation to plant health controls and market information, each officer could handle at least 160 hectares of certified area with support from other staff during peak times. Full cost recovery could be achieved over a period of five years commencing at 50%, initially.

75. The current field classification scheme for Class X seed should be replaced by audits of ware growers. These audits should be on the basis of risk analysis and carried out by officers of the Horticulture and Plant Health Division in conjunction with the audits for compliance with the Registration of Growers and Packers Act.

76. The costs of sampling and testing for PCN (eelworm) should be borne by the grower. Teagasc could also provide the sampling service in addition to the analytical service which it currently undertakes for the Department. The savings to the Department would be €350,000 (€190,000 staff costs and €160,000 analytical charges).

77. Seed Certification staff spend about 5% of their time in the enforcement of the Registration and Standards Regulations on farms at a cost of €45,000. This work should be integrated with the inspections carried out by Horticulture and Plant Health Division.

78. Seed Certification staff spend 13% of their time at a cost of €146,000 providing market prices, carrying out surveys, etc. This represents almost twice the Bord Glas costs for providing market intelligence for potatoes in 2002. The collection of market information, etc., should be centralised in the Crop Production and Safety Division and Horticulture and Plant Health Division in conjunction with An Bord Glas. Developing and maintaining an up-to-date data base under the Growers and Packers Act would provide all the necessary information currently provided by the annual survey.

Plant Breeders Rights

79. EU and national legislation governs the operation of plant breeders rights in Ireland. Each Member State is obliged to establish an Office of the Controller of Plant Breeders Rights, the functions of which are to grant rights, maintain registers, collect renewal fees and liaise with EU and International organisations in relation to plant breeders rights. In Ireland, the head of the Seed Certification Division in DAF is the Controller of Plant Breeders Rights. There are a total of 78 varieties, across a number of plant species, which have been registered for rights in Ireland of which 46 are potato varieties. Teagasc has rights to 19 of these potato varieties.

80. The costs of operating the schemes, excluding the Tops centre, is estimated at €8,000 for the two inspectors involved.The savings from any other administrative arrangements would be minimal.

Chapter 3

Schemes provided by State Agencies

Teagasc Research Services

81. Potato breeding is the main research activity carried out at the Teagasc Research Centre in Carlow. This activity consists of breeding improved varieties for the domestic and seed export markets. Since the breeding programme commenced in 1962 some 30 varieties have been bred of which 17 are still in commercial use, most of them abroad. Since 1972 Teagasc has a contractual arrangement with Irish Potato Marketing Ltd, a subsidiary of Donegal Plc, under which IPM has the rights to all Teagasc varieties and derives royalty income from them.

82. Of the 17 Teagasc varieties available there are only two grown in Ireland – Rooster and Cara. Rooster accounts for practically all the area for ware while Rooster and Cara make up the seed area. The area of Teagasc bred varieties sown for seed has declined from 27% of the area in 1992 to 18% in 2002. The area of Teagasc varieties sown in Scotland has increased over the same period.

83. The staff and operational costs of the breeding programme in 2002 was €776,134, of which €543,000 was recouped from IPM through royalties and grants. The balance of the operational costs (€233,0000) including the capital costs are borne by Teagasc. Additional state costs are incurred through inspection and other services provided free of charge by the Department. These relate to inspection services provided for the breeding programme, variety testing, pre-basic seed production, seed certification, wart disease testing, etc. The Department pays Teagasc for all services which they provide- PCN testing in Kinsealy (€160,000), Cooking and Quality testing of varieties under trial in Oakpark.

84. The Teagasc Breeding Research Programme has been evaluated by Boyle *et al.* The study examined the costs and benefits of the programme over the period 1962-1982 and estimated a return in excess of 5%. The report states that this is substantially below the high rates generated for agricultural research in the international literature.

Teagasc Advisory Service

85. The objective of the advisory service is to improve technical efficiency and best management practices. An average yield of 40 tonnes per hectare is a national target.

86. The programme is delivered through one full time National Potato specialist and 27 locally based potato advisers. The total costs of salaries and expenses for the 5 full time equivalents in the service was €300,000 in 2002.

Bord Glas

87. The statutory remit of An Bord Glas is to assist the production, marketing and consumption of horticulture produce in Ireland. In the attainment of its strategic objective €359,440 was expended in the potato sector in 2002: Promotions- €155,220; Market Intelligence- €88,620; Quality- €41,650; Business Development- €46,000; and Industry Development- €29,250.

The State Laboratory

88. The State Laboratory carries out analysis of samples submitted by the Department for ring rot and brown rot as part of the annual survey for these organisms. Analyses are also carried out on imported potatoes. The numbers of samples tested is about 500 per annum under the survey and 100 import samples.

CHAPTER 4

Relationship/Compatability of the Schemes with the Departments Statement of Strategy

89. There is a high degree of compatability between the programmes carried out in the potato sector and the goals/strategies in the Statement of Strategy with the exception of Goal 1.5 which refers to the expansion of export markets. There is, however, scope for improving the cost effectiveness of many of the potato schemes. There is a need for more immediate and effective measures, other than expenditure reviews, to ensure that all schemes are providing value for money and are continuously adapted and adjusted to the changing policy environment within which they function.

CHAPTER 5

Recommendations

90. The Food Standards (Potatoes) Regulations and the EU Fruit and Vegetable Standards Regulations should be included in a Service Contract with the FSAI. Inspections should be based on risk analysis with participation in Bord Glas Quality Programme factored into the risk. DAF officers should mainly concentrate on wholesale premises while enforcement of the potato labelling legislation in retail outlets should be part of the general labelling enforcement under the FSAI. Horticulture and Plant Health Division should be responsible for all DAF inspections, including inspection of growers under the Food Standards Regulations and the Registration of Potato growers and Packers Act.
91. Horticulture and Plant Health Division should have overall responsibility for plant health controls for potatoes including those currently carried out by Seed Certification Division. Plant Health Controls for potatoes are obligatory under EU regulations and essential for the maintenance of the country's high plant health status.
92. Grants for Capital investments in the potato sector should continue but be mainly targeted at value added projects. The existing administrative arrangements are satisfactory and should be maintained.
93. The Potato Variety Evaluation scheme should continue under DAF in Backweston on a cost recovery basis.
94. Production of minitubers and pre-basic seed, currently carried out at the Tops Centre, should be carried out by private operators and growers. The role of the State should be in providing the germplasm from which virus-free stock can be propagated by private operators and growers. Tops or Teagasc Oakpark could provide the germplasm. Most of the other activities in Tops could also be carried out at the Teagasc Oakpark Research Centre.
95. The Department of Agriculture and Food should continue to operate the seed certification scheme. There should be full cost recovery on field charges for the seed certification service. The following operational changes will be required:
    - Each Technical Agricultural Officer would be responsible for certifying at least 160 hectares of certified seed. Inspection fees should be charged starting at 50% and rising to 100% over five years.
    - The current field classification scheme for non-certified home grown seed (Class X) should be replaced in the main by a risk based audit inspection programme of growers and their records. Inspections would be carried out by officers of the Horticulture and Plant Health Division in conjunction with their inspections relating to the Registration and Standards Regulations.
    - The sampling and testing for Potato Cyst Nematode (PCN) should be carried out at the grower's own expense.
    - The collection of market information should be centralised in Crop Production and Safety Division/Horticulture and Plant Health Division (Maynooth). A data base should be developed to capture all information relevant to the potato schemes operated by the Department.
    - Application forms and fees for the seed certification scheme should be centralised in Crop Production and Safety Division. All potato areas should be included in the Department's *iMap* database.
96. The Office of the Controller of Plant Breeders Rights should continue in the Department of Agriculture and Food. Fees and administrative charges should be subject to annual review.
97. Teagasc should endeavour to maximise the contribution of its potato breeding programme to the Irish economy and provide a comprehensive research, advisory and information service for the seed potato sector.
98. Bord Glas should have primary responsibility for the collection and dissemination of market intelligence. The participation of growers in the Bord Glas Quality Scheme should be a pre-condition of state support.

Financial Impact of Recommendations

99. The total costs of the schemes provided by the Department in 2002 is estimated at €2.49m. This is broken down between staff costs (€2.21m) and operational costs (€0.28m). The inclusion of the Capital grant aid of €0.72m which was provided to the sector in 2002 brings the total costs to €3.21m.

100. The staff and operational costs of the programmes provided by Teagasc and Bord Glas amounted to €1.49m but when income of €540,000 received by Teagasc for variety rights is included, these costs fall to €0.95m. Accordingly, the total staff, operational and grant costs of all the State programmes amount to €4.2m.

101. The Capital costs associated with the Department and Teagasc schemes are additional to these costs. The value of the capital resources associated with potatoes at the Tops and Backweston Centres is estimated at €3.0 million.

102. The implementation of the recommendations in the Report could effect savings to the Department in staff and operating costs of the order of €1.6m to €1.8m. There would be some capital and operational cost increases in Teagasc if that body took on the duties currently carried out in the Tops Laboratory. There may also be a need for a grower subsidy for pre-basic seed production for a limited period should the Department withdrew from this activity.

Performance Indicators

103. The Statement of Strategy provides a list of performance indicators against which all Department schemes and services should be measured. Arising from this Review it is considered that more specific indicators, particularly from a financial perspective, would be of assistance to management in planning programmes and prioritising work in a tight budgetary framework. It is also important from a policy perspective regarding the development of the potato industry. A list of the key performance indicators appropriate to each of the six schemes examined in the report are therefore outlined.

Chapter 1

The Scale and Structure of the potato sector in Ireland and changes/developments, which have taken place in the sector over the past ten years

1.1 EU Policy Framework

The Irish potato sector is small by EU standards representing about 1% of EU production of 45 million tonnes. Apart from starch potatoes grown in mainland Europe, there is no Common Organisation of the Market compared to most of the other tillage sectors such as cereals, protein crops, oilseeds, sugar beet, etc. where subsidies and/or market supports are in operation. However, potatoes are governed by EU legislation under the plant health regulations which apply equally across the community.

Prior to our entry to the EU over one million tonnes of potatoes were produced compared to a half that level now. In the last decade the production area has halved with producer exit from the sector accelerated by market forces and alternative farming options within the supported CAP. While there has been a decline in overall EU production over the decade, the reduction is not as marked in the UK or The Netherlands, countries which Ireland has traditionally competed with on export markets. The fall in the UK area was about 12% but Scottish production remained stable right through the decade and peaked in 2002. Production in the Netherlands declined by 14% in the period under review. Data on the total potato area in the EU and selected countries is presented in Table 1.

Table 1: Area (000 hectares) under potatoes in the EU and selected countries

Year	EU	Ireland	UK	Scotland	Northern Ireland	The Netherlands
1992	1,297	22.0	180.1	28.3	11.1	185.8
1994	1,103	21.4	163.6	26.7	8.7	171.0
1996	1,125	24.3	177.4	29.6	8.8	185.0
1998	1,004	18.5	164.1	29.0	7.5	126.5
2000	991	13.5	166.0	29.8	6.8	176.0
2002	950 (Est)	13.4	159.0	30.2	6.7	160.5

Seed production also declined in the EU in the period under review. In Ireland, the certified seed area declined by 46%, Northern Ireland by 71% and in Scotland by 11%. The areas and volumes grown in these regions is outlined in Table 2.

Table 2: Certified Seed potato area and volume 1992-2002 in Ireland, NI and Scotland

Year	Republic of Ireland		Northern Ireland		Scotland	
	Area Certified HA	Volume Certified Tonnes	Area Certified Ha	Volume Certified Tonnes	Area Certified Ha	Volume Certified Tonnes
1992	2,852	17383	3,688	NA	14577	292993
1994	2,845	20554	2,255	NA	13382	260919
1996	3,002	19853	2,257	27144	15309	319183
1998	2,220	12710	1,652	20869	13919	311216
2000	1,781	13270	1,113	14002	13628	223007
2002	1,537	10358	1,080	12838	12978	288604

Source DAF, DARDNI, Scottish Agricultural Science Agency

The policy environment for the supported sectors has changed considerably in the period under review. The 1992 CAP Reform and the Agenda 2000 Reform swung the balance in supports from that of supporting the market to supporting the farmer directly within a rigid quota framework. As shown in Table 3, this policy provided a relatively stable production

base for cereals and sugar beet which represent 90% of the tillage area. Maize also benefited from direct payments and its area increased from almost zero to 20,000 hectares over the decade. Potatoes on the other hand fell from 6.4% of the tillage area in 1992 to 4.6% in 2002. The impact of the Luxembourg Agreement in 2003 which represents a fundamental shift in the above policies through the decoupling of payments from production and the abolition of quotas could bring about further changes in potato production.

Table 3: Area under Tillage 1992-2002
(000 Ha's)

Year	Wheat, Oats & Barley	Turnips and Fodder Beet	Sugar Beet	Potatoes	Maize	Total Area under Tillage	Potatoes as a % of total Tillage Area
1992	295.1	16.5	31.3	22.1	Na	365.0	6.1%
1994	264.7	15.4	35.4	21.4	3.6	340.5	6.3%
1996	287.9	15.2	32.3	24.2	3.9	363.7	6.8%
1998	293.9	11.9	32.8	18.4	5.9	363.2	5.0%
2000	277.0	2.1	32.2	13.5	13.7	338.6	3.9%
2002	297.5	1.6	31.2	15.3	19.8	365.6	4.2%

Source CS0

1.2 Output and Value

The potato sector has undergone dramatic change in Ireland in the period under review. As outlined in Tables 1 and 2, the total production area has fallen by over 30% since the first half of the last decade to a current area of 13,400 hectares. While productivity has increased in the period, due mainly to improved varieties and agronomic factors, the overall volume of potatoes has fallen by about 25% in the period. The farmgate value of the sector has also declined in real terms over the period with gross output valued at €96m in 2002 (Table 4).

Table 4: Output and Production of potatoes 1992 – 2002

Year	Gross Output (€M)	Production (000 tonnes)	Number of Hectares
1992	98.7	638.0	22,100
1993	85	569.0	22,100
1994	129.4	642.0	21,400
1995	132.5	618.0	22,400
1996	96	733.3	24,300
1997	53.6	471.9	18,200
1998	105.1	482.1	18,500
1999	120.2	558.6	17,500
2000	58.4	454.8	13,500
2001	98.8	477.6	14,300
2002	95.8	518.6	15,400

Source CSO

The output value is very much dependent on the price of potatoes which can vary considerably from year to year depending on market supplies. In this regard EU production and price levels, particularly those in the UK market, can exert a major influence. The data in Table 5 shows that Irish potato prices in 2002 were much higher than in Northern Ireland or Great Britain. The preference by Irish consumers for potato varieties with high dry matter compared to the UK has given rise to market differentiation and this accounts to some extent for the price variations in the Table.

Table 5: Farmgate Prices for Potatoes in Ireland and Northern Ireland in 2002

Category	Price per tonne Ireland	Price per tonne Northern Ireland	Price per tonne Great Britain
1st and 2nd Earlies	€396		€156
Maincrop	€282	€140	€94
Processing – prepared & frozen	€171		
Crisping	€158		
Seed	€414	€226	

Source: An Bord Glas, DARD NI, British Potato Council

1.3 Consumption, supplies and storage

Consumption of potatoes in Ireland remains relatively stable. While the demand for convenience food products, changing lifestyles, nutritional and health issues have had an impact, Irish consumers have the highest consumption levels of potatoes in the EU which in 2000 were estimated at 162kg per head. This was an increase of 8% on 1996 levels. The major growth area is in the processing end of the market which is serviced mainly by imports.

Potato production in Ireland is mainly focused on the fresh ware market serving domestic consumption. Investment in storage facilities has resulted in the availability of quality ware potatoes for almost the entire year. At retail level there has also been major changes over the decade with the multiples exacting major influences on the market. Buying power is now concentrated in the hands of 5-6 retail multiples who control 65-70% of the ware market and over the past five years these multiples have largely consolidated their supply base in five potato pre-packers who in turn are mainly serviced by large specialist growers. This has brought about a tighter supply base and provided for greater controls on traceability, quality and food safety.

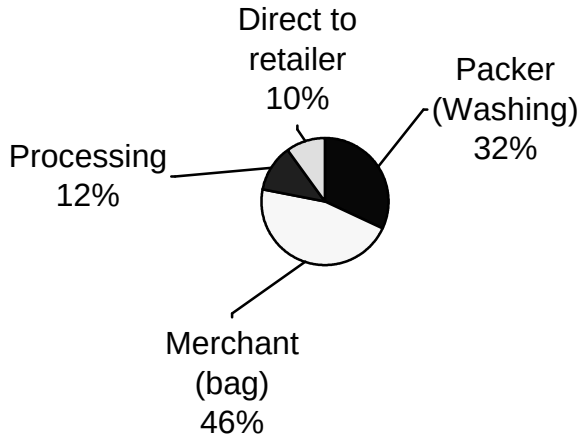
Quality Assurance Schemes

One of the major developments spearheaded by the multiple retailers over the decade has been the development of quality assurance programmes which provide independent guarantees that food products meet the highest standard. This process is being driven by the consumer who requires a quality product in terms of its visual appearance, the system within which it was produced, its safety and traceability. The Bord Glas Quality Programme was developed to promote quality standards within the horticulture industry, including the potato sector. The standards for the Bord Glas programme are based on legislative, best practice and market requirements. The scope of the standard covers cropping practice, quality and hygiene, pack house, cold chain, crop protection products and the keeping of records. Each participating grower and wholesaler in the Programme undergoes two independent audits per annum. This process involves inspection of the enterprise by a Bord Glas appointed quality auditor against a set of defined criteria. The rules and regulations are set down in *quality manuals* which cover all aspects of production. Fulfilling the legislative requirements is a minimum condition of the scheme.

The scheme was targeted initially at potato packers and now all the major potato packers are participating and have achieved the Bord Glas Quality Award. Potato producers are now joining the programme in increasing numbers. While participation in the programme is voluntary, many growers supplying key outlets on the home market are required by these customers to be a participant in the Bord Glas Quality Programme as one of the conditions of supply. Currently there are 145 growers in the programme representing 45% of the ware potato area in Ireland. The aim is to have 200 growers representing 80% of the suppliers in the programme.

Market outlets
Diagram 1 below shows the main market outlets for potatoes post-harvest: these include retail (approx 10%), processing (approx 12%), washed potatoes (approx 32%) and merchant/wholesale bags (approx 46%). The major retail multiples have the dominant market share of fresh produce in Ireland, which is estimated at 65-70 %.

Diagram 1



Retail research carried out for An Bord Glas valued Irish potato sales at €150.3m in 2001, an increase of 13.5% on 2000. Prepacked potatoes, valued at €134.2m grew at a faster rate (14.7%) than the market generally. This reflects consumer preference for convenient smaller packs. Pre-packs now account for 95% of total retail sales.

Processed Potatoes
The processing of potatoes involves washing, peeling, cutting and varying temperature treatment to alter their nature and extend shelf life. Processed potato products are mainly volume driven international commodities and are traded as such (e.g. frozen chips, crisps etc.). As a result the major part of the raw material used to produce these products is grown overseas and imported into Ireland as finished product. From an Irish producers point of view this is of critical concern not only because of the absolute size of these markets but also because of the high growth rates. Convenience has become a very important consideration in relation to consumers' choice for these products.

Chipping
Large multinational potato chip manufacturers, who often have a presence in many continents, dominate the European chipping industry. It is largely brand power, product range and scale of operation issues that prove a barrier to entry for many smaller processors, who may have to enter private label or co-pack arrangements to access markets. The main brands found on the Irish frozen chip market include Birds Eye, Donegal Foods, Green Isle, McCain, Ross and retailers private label. At present most of these manufacturers source and process their frozen chips overseas. There is no indigenous internationally competitive potato processing operation in Ireland. However, some smaller-scale operations exist around the country serving local and domestic market needs.

Crisping
Potato crisps belong to the hugely differentiated range of snack food items on the market world wide. The snack food category is dominated by big name international brands. However, Ireland has two of the leading brands/manufacturers in the Irish potato crisps market, namely Tayto and Perri. These companies have manufacturing facilities in counties Dublin and Meath respectively, and between them purchase in excess of 50,000 tonnes of Irish grown potatoes per annum.

Speciality Potatoes
Speciality frozen potato products in Ireland represent a small but developing market opportunity. Small niche markets exist to supply speciality potato products to the Irish retail and catering markets. These are typically unique product offerings or specialist manufactures items, e.g. croquettes, roast potatoes, waffles, hash browns, potato wedges, shapes and baked potatoes. The main brands sold in Ireland include Green Isle, Birds Eye, McCain, Rita Ahern, First Choice, Hula Hoops and retailers private label. New product innovations and brand launches are driving the frozen speciality potato market. Imports into Ireland of speciality products amounted to €24.1m in 1993, and to over €54.6m in 1999 (these figures exclude potato crisps).

Prepared Market
Demand for fresh prepared potato products which has increased in recent years has been driven by consumer needs for quality and convenience foods. Potatoes are versatile in terms of use in the preparation of convenience prepared foods and ready meals. This strong growth rate in the convenience and prepared potato market has resulted in strong demand for peeled prepared whole or sliced/diced potatoes and potato salad deli-items. As out-of-home consumption trends continue to become more important it is likely to strengthen demand in the foodservice/catering market, i.e. hotels, restaurants, pubs and institutional/contract catering. There is estimated to be 25–30 medium to large scale fresh cut industrial potato peeling operations in Ireland at present.

Potato Stores
Significant investment has taken place in the sector over the last ten years with over €65m invested by primary producers in improving infrastructure in the grading, handling and storage of potatoes. This investment has been supported by over €20m in state grants targeted in particular at investments in cold storage facilities. The total potato storage capacity in the state is now estimated at over 360,000 tonnes – shed and lean-to 33%, ambient stores 32% and refrigerated stores 32%. National storage capacity for potatoes is now of the order of 360,000 tonnes of which refrigerated stores account for 32%. Approximately 1% of storage capacity relates to stores for processing varieties. Total refrigerated storage in 2002 is estimated at 117,445 tonnes owned by 94 growers. The largest growers (more than 50 ha) have 72% of all refrigerated storage capacity. A major proportion of the investment which has taken place in the sector in the last decade was in the building of cold storage facilities. This type of storage is regarded as the optimum way to proceed in terms of securing the future of the Irish potato industry, by providing for the all-year- round marketability of Irish Potatoes. A breakdown of the storage capacity is given in Table 6.

Table 6: Potato Storage Capacity 2002

	Growers	**Capacity (Tonnes)**
Shed & Lean To	585	118,585
Ambient Stores	147	123,495
Refrigerated Stores	94	117,445
Purpose Built for Processing Varieties	6	2150
Total	**727**	**361,675**

1.4 Imports and Exports

Ware and Processed Potatoes
All frozen chips on the Irish market are now imported while a considerable proportion of the fresh chip market is also serviced by imported ware, mainly from the UK. Approximately €5m worth of Maris Piper variety of potato are imported into Ireland each year to service the fresh chip market. This variety is preferred as it gives the desired golden fry colour to the product. Irish growers can supply the fresh chip market from July to late Autumn, but

have difficulty in maintaining the required colour after the potatoes are placed in storage. Currently Bord Glas and Teagasc are working on a research project to develop a blueprint for the production and long term storage of Maris Piper in Ireland.
Tables 7 and 8 below give a breakdown of the levels of imports and exports of ware and processed potatoes over the period of the review.

Table 7: Imports and Exports of Ware potatoes

Year	Imports		Exports	
	Tonnes (000)	Value (Million)	Tonnes (000)	Value (Million)
1992	65.3	12	9.3	1.7
1994	74	18.2	3.9	1.02
1996	32.6	10.7	7.9	2.2
1998	54.1	16.7	4.2	1.52
2000	29.2	10.5	1.8	0.6
2002	44.4	14.9	1.5	0.5

Source CSO

Table 8: Imports and Exports Of Processed Potatoes

Year	Imports		Exports	
	Tonnes (000)	Value (Million)	Tonnes (000)	Value (Million)
1992	23.3	17.1	1.9	3.8
1994	59.9	36	2.3	3.78
1996	59.5	45.3	4.3	6.4
1998	68.2	53.6	5.1	8.98
2000	75.3	67.7	4.7	8.9
2002	70.7	76.5	5.9	14.7

Source CSO

Total imports of ware and processed potatoes in 2002 amounted to 115,000 tonnes valued at €91m. Ware imports have remained relatively stable over the decade at around 50,000 tonnes. These imports are mainly processing varieties used for the fresh chip trade and were valued at €15m in 2002. Processed potatoes, mainly frozen chips, have increased threefold since 1992 to 71,000 tonnes in 2002 valued at €76m. There is currently no chip manufacturer in the Republic of Ireland but some potatoes are supplied to an operation in Northern Ireland. A recent study commissioned by An Bord Glas considered that the establishment of a chip factory was unviable here.

While the amount of exports is relatively small compared to imports a significant export trade has developed over the past few years in niche markets for high quality processed potatoes. The value of these exports amounted to approximately €15m in 2002 compared to €3.9m in 1992.

Seed Potatoes
Traditionally, Ireland has been a major exporter of certified seed potatoes. This export trade reached its peak in 1968 when 49,317 tonnes was exported. On entry to the EU in 1973 exports had fallen to 24,043 tonnes and the trend has been downwards since then with the decline accelerating over the past decade. Current exports are the lowest on record since this trade started in 1950. Table 9 shows that the quantities certified, exported and imported between 1992 – 2002. From a peak of 9,000 tonnes in 1996 exports fell to 441 tonnes in 2002 while imports in the period increased to over 15,000 tonnes.

Despite the fall in Irish certified seed production it is notable that the quantity of Irish certified seed used at home has remained relatively stable at around 10,000 tonnes per annum.

Table 9: Quantity of seed certified, exported and imported 1992-2002

Year	Total Certified	Total Exported	Total Imported
1992	17,383	6,6558	9183
1993	17,946	6,600	
1994	20,554	7,131	2367
1995	18,129	6,014	
1996	19,853	9,067	4391
1997	17,608	7,849	
1998	12,710	3,407	7401
1999	18,444	7,819	
2000	13,270	3,894	13274
2001	14,040	3,014	
2002	10,358	441	15566
Source	*DAF*	*DAF*	*CSO*

Data on the destination of exports is given in Table 10. The total value of seed exports fell from €2.6m in 1992 to €0.3m in 2002.

Table 10: Seed Exports by Destination to main markets (tonnes)

Destination	1992	1994	1996	1998	2000	2002
N. Ireland	2434	16	36	2	50	37
GB	668	774	5	3	338	44
Cyprus	179	2048	914	853	470	289
Israel	857	251	909	16	-	-
Malta	48	193	592	390	-	15
Canaries	552	98	166	-	-	-
Egypt	42	1622	400	-	-	-
Spain	1254	40	54	-	-	-
Portugal	64	318	995	-	-	-

Source CSO

Third country markets which were once supplied by Irish exports have now been replaced by Scottish exports. This trend has been in evidence over the decade since Irish Potato Marketing Ltd (IPM)[1] moved its base from Ireland to Scotland in the early 90's. IPM who own the royalties of all the Teagasc bred varieties is now the dominant exporter of seed potatoes from Scotland. In the 2001/2002 season these exports amounted to 16,617 tonnes which was an increase of 28% on the previous year. A breakdown of Scottish seed potato exports is provided in Tables 11 and 12 with further analysis in Section 1.6.

Table 11: Scottish Seed potato exports to Third Countries (Tonnes)

Variety	2002/2003	2001/2002	% change
Teagasc Bred Varieties	16617	12938	28%
Other varieties	50253	36198	39%
Total	**66870**	**49136**	**36%**

Source: The Scottish Executive Rural Affairs Department

[1] IPM is a subsidiary of Donegal Creameries Plc, having been taken over in 1997. IPM have contracts with Teagasc since 1972 for the ownership of its varieties.

Table 12: Scottish seed potato exports to Third Countries of Teagasc bred varieties

Country	2002/2003	2001/2002
Egypt	10174	7617
Canaries	3235	2993
Syria	1105	610
Morocco	984	273
Cyprus	285	292
Other Countries	834	1153
Total	16617	12938

Source: The Scottish Executive Rural Affairs Department

Some of the reasons given by Teagasc for the decline in the export trade and the shift of its varieties to Scotland are as follows:

- Structural problems relating to small size of seed grower holdings, particularly in Donegal where most of IPMs growers were concentrated, and scarce labour supplies.
- Larger ware growers are reluctant to grow seed because of high ware prices and the higher associated margins and avoidance of the risk of being rejected for certification
- The difficulty in disposing of the ware fraction of seed export varieties due to these varieties being of low dry matter and therefore less preferred by consumers who favour the high dry matter varieties.
- Seed can be purchased for less in Scotland because of the high ware prices in Ireland
- Perceived problem of Blackleg in Irish seed crops by foreign buyers

Import Data

In relation to seed import data, the CSO figures are much higher than those estimated in the National Potato Survey[2] for 2002. This survey showed imports of 5,970 tonnes of certified seed of which 5,181 tonnes came from Scotland and 789 tonnes from Northern Ireland

According to the survey the amount of seed imported from Scotland in 2002 increased from 3987 tonnes on 2001 while imports of seed from Northern Ireland remained relatively similar to 2001. The following are pertinent points from the survey:

- The source of seed for maincrop varieties was 51% Irish Certified Seed, 14% imported and 35% home saved
- The source of seed for 1st and 2nd earlies was 48% Irish Certified Seed, 28% imported and 24% home saved
- The source of seed for processing varieties was 62% Irish Certified seed, 25% imported and 13% home saved
- As the size of holding gets larger the proportion of home saved seed decreases and the proportion of imported seed increases
- The larger growers are more likely to import seed

An earlier survey[3] of ware growers carried out by An Bord Glas in May 2000 to get their views and purchasing patterns for seed potatoes provided additional information on this issue. While the number of respondents to the survey was small at 10% of the 300 growers questioned, 12 growers or 40% of the survey sample purchased their certified seed supplies solely from Ireland. A further 13 respondents purchased their certified seed from both Ireland and at least one other country, while five respondents purchased their certified seed abroad.

[2] An Bord Glas/Department of Agriculture and Food National Potato Census
[3] Seed Potato Survey 2000 (An Bord Glas)

Estimated seed imports for 2003
Department data for 2002, regarding the total quantity of seed certified, seed used for home use by certified seed growers and Class X seed retained by ware growers for sowing in 2003, shows the following:

Tonnes certified for home	9917
Tonnes certified for export	441
Tonnes retained for home use (Cert growers)	5230
Class X	9829
Total	**25480**

Excluding exports this would leave 25,000 tonnes of Irish seed available for the Irish potato crop (ware and seed). With an estimated area of 14,000 hectares this would require about 34,000 tonnes of seed of which 9,000 tonnes or 26% would be provided by imports or from other sources.

1.5 Structure of Sector

All potatoes (Ware and Seed)
The decline in potato production area which continued through the 90's has stabilised at around 13,500 hectares, having fallen from 16,500 hectares in 1992. The number of potato growers, however, continues to decline. In the period under review the number of growers has fallen by 53% to a current level of 832 with 43% of this decrease taking place over the past five years. The reduction in potato growers has primarily come from growers with smaller holdings. As smaller growers leave the sector, production is becoming increasingly concentrated among a small number of large growers. The largest 50 growers now account for 45% of the total production area with the largest 200 accounting for 79% of the total area. The average size of holding has increased from 9.3 hectares in 1992 to 16.1 hectares in 2002, an increase in holding size of 73%. There is considerable variation between the regions ranging from an average of 8Ha per holding in the west to 22Ha in the east.

Table 13 gives a breakdown of growers and area by province with a county breakdown provided in Annex 2. The information in these tables can be summarised as follows:

- Leinster contains over half the countrys' potato growers and three quarters of the potato area. The potato area in Leinster has remained relatively stable over the decade having fallen by 9% in the period but the average size of holding has increased from 14 Ha to 22 Ha with the number of growers falling by 43%.
- Ulster (Donegal) has seen the highest contraction in both area and growers over the decade. The area under potatoes has fallen by 43% to 1411 Ha and the number of growers by 70% to 144. From a situation in 2002 when Donegal had 15% of the area and 28% of the growers in the country, it now has 10% and 17% respectively and falls behind Leinster and Munster. Holding size in Donegal has followed the national trend with the average size increasing from 5Ha to 10 Ha per holding.
- Production in Munster is concentrated in Cork which accounts for 65% of the area and 63% of the growers. Over the decade production area in the province has fallen by 35% and grower numbers by 55%. The average size of holding has increased from 6.6Ha to 9.5Ha in the period.
- Connacht has the smallest area and least number of growers in the country with Galway accounting for over half the area in the province. The total area in production in 2002 was 229 Ha which represented a decrease of 8% on the 1992 area. Grower numbers declined by 42% in the period to 54. The average size of potato holding is now 4.3Ha compared to 2.6Ha in 1992.

Table 13: Ware and Seed potatoes – grower numbers and area 1992-2002

	1992		1994		1996		1998		2000		2002	
	No of Growers	Area	No of Growers	Area	No of Growers	Area	No of Growers	Area	No of Growers	Area	No of Growers	Area
Ulster	488	2645	471	2028	383	2079	288	1751	189	1420	144	1411
Connacht	94	248	87	218	88	273	79	322	61	264	54	229
Munster	422	2780	393	2733	398	2798	292	1945	227	1657	190	1796
Leinster	772	10846	773	11701	799	13017	604	11816	479	9831	444	9994
Overall Total	1776	16,519	1724	16,680	1668	18,167	1263	15,834	956	13,172	832	13,430

Source: An Bord Glas/DAF Surveys

Seed Potatoes

The certified seed area and the number of growers have been in steady decline over the last number of decades. Since 1992 the seed potato production area has declined by 46% and grower numbers by 68%. Currently there are some 240 growers producing certified seed on about 1500 Ha having decreased from 766 growers and 2851 Ha in 1992. A breakdown of the area grown and the number of growers is given in Table 14 with a county breakdown given in Annex 3. This data can be summarised as follows:

- **Ulster (**Donegal) accounts for 42% of the certified seed area and 45% of the growers in the country. The area in Donegal has contracted by 63% over the decade to the current level of 640 Ha. The number of producers has fallen by 77% to 112. The average area grown per holding has increased from 3.5Ha to 5.7Ha over the decade.

- **Leinster** has 65 growers producing 590 Ha which is predominantly concentrated in Louth (58%), Wexford (16%), Kilkenny (7%), Offaly (6%) and Carlow (4%). The average size of holding in Leinster is 9 Ha having increased from 6.6 Ha in 1992. Average size of holding in Leinster is twice the rest of the country.

- **Munster** has 247 Ha grown by 47 producers with Cork and Tipperary accounting for approximately 86% of the area and grower numbers. The decline in the area and growers has been of the order of 48% and 39%, respectively, resulting in an average size of holding of 5.2 Ha.

- **Connacht** has 20 growers who produce certified seed on 60 Ha. The number of growers in 1992 was 62 with a seed production area of 94 ha. The average size of holding has increased from 1.5 Ha to 3 Ha over the decade.

Table 14: Seed Potatoes – area and growers 1992-2002

	1992		1994		1996		1998		2000		2002	
	No of Growers	Area	No of Growers	Area	No of Growers	Area	No of Growers	Area	No of Growers	Area	No of Growers	Area
Ulster	495	1711.1	432	1,564	348	1467.9	203	1072.6	129	767.52	112	639.96
Connacht	62	94.30	48	91.87	37	139.91	26	131.47	24	99.7	20	59.6
Munster	77	167.00	55	286.30	70	459.89	58	344.2	51	300.9	47	247.5
Leinster	132	879.40	99	902.69	100	934.05	75	671.41	65	612.42	65	590.64
Total	**766**	**2,851.8**	**634**	**2,844.9**	**555**	**3001.7**	**362**	**2219.6**	**269**	**1780.54**	**244**	**1537**

Source: An Bord Glas/DAF Surveys

Donegal, Louth, Cork and Wexford accounted for 80% of the production area in 2002 and 89% of the quantity certified as outlined in Table 15. The average quantity certified in these counties was 7.5 tonnes per hectare while the average in the rest of the country was less than half this figure at 3.6 tonnes per hectare.

Table 15:

Area Entered for Certification and tonnage certified in Main Production Counties in 2002				
	Area Classified (ha)	**% of National Area Classified**	**Tonnes certified**	**% of National tonnage certified**
Donegal	636	41%	5119	49
Louth	341	22%	2588	25
Cork	152	10%	830	8
Wexford	95	6%	677	7
Others	314	20%	1144	11
Total	**1538**	**100%**	**10358**	**100**

Source: DAF

Further analyses of the structure of the seed potato sector is given in Tables 16 and 17. The following information may be drawn from this data:

- Half of the growers in the country are under - 3 Ha and produce 1500 tonnes of seed or 12 tonnes each

- Over half (52%) of the seed is produced by 16 growers in the over -20Ha holding category
- Approximately 9 tonnes of seed is produced per hectare, with producers in the over – 20 hectare category producing about 14 tonnes per hectare

Table 16: Breakdown by size of area certified

Area	No of Growers		Total Area Certified (Hectares)		Total weight[4] seed produced (tonnes)	
	1992	2001	1992	2001	2001	(Ave per Ha)
Less than 0.5 Ha	141	13	44	4	46	(11)
0.5-1.0	158	16	103	10	101	(9)
1.0-2.0	159	51	201	67	607	(9)
2.0-3.0	93	40	214	90	756	(8)
3.0-4.0	38	23	123	76	708	(9)
4.0-5.0	38	18	161	75	609	(8)
5.0-10.0	69	32	479	233	2011	(9)
10.0-20.0	42	27	561	360	3645	(10)
20 +	28	16	966	635	9129	(14)
Total	**766**	**236**	**2852**	**1550**	**17,615**	**11**

Source DAF

Table 17: Seed Potato Certification Scheme – Total Area Classified & Percentage of Area Classified within various Size Segments 1996-2002

	1996		1999		2002	
Size Segment(ha)	Area Grown in Segment	% of Total Area	Area Grown in Segment	% of Total Area	Area Grown in Segment	% of Total Area
0-1.99	231	8%	101	5%	86	6%
2-4.99	424	14%	323	15%	220	14%
5-9.99	465	16%	306	14%	245	16%
10-14.99	344	11%	298	14%	168	11%
15-19.99	296	10%	201	9%	143	9%
20-29.99	260	9%	296	14%	212	14%
30-39.99	175	6%	140	7%	139	9%
40-49.99	264	9%	97	5%	93	6%
50-99.99	191	6%	162	8%	90	6%
100+	351	12%	219	10%	141	9%
Total	**3002**		**2143**		**1538**	

Source: DAF

1.6 Potato varieties

Over the past decade potato growers have adopted a more market-orientated approach towards the selection of varieties for the market. There are now just four main varieties which account for the bulk of the fresh ware trade - Rooster, Kerr's Pink, British Queen and Records. Another change has been the significant increase in the planting of processing varieties most of which are grown specifically for the manufacturing of crisps, frozen/fresh chips and speciality potato products.

[4] This data is based on the An Bord Glas/DAF 2001 survey and includes seed retained for home use on the farm. The actual quantity of certified seed produced in 2001 was 14,040 tonnes.

The majority of potato production is devoted to main crop varieties and account for almost three-quarters of the total production area. 1st and 2nd early varieties account for 15% and processing varieties account for 14% of production area.

Table 18 shows the potato varieties grown in Ireland over the last 10 years. A more detailed breakdown is provided in Annex 4 . The top four main varieties accounted for approximately three-quarters of the total production area during this period. However, the composition of these varieties has changed considerably over the period. The Teagasc bred variety Rooster which only came on the market in 1992 now commands the leading position with 32% of the market followed by Kerrs Pink (25%), British Queen (11%) and Record (6%).

While the main crop varieties continue to dominate the production area, there is an increased emphasis on processing varieties in recent years. Varieties such as King Edward, Maris Piper and Cara are being replaced by other processing varieties such as Lady Rosetta.

Table 18: Percentage of Production Area under the main varieties 1992-2002

Variety	1992 - %	1996 - %	2000 - %	2002 - %
King Edward	1	-	-	-
Maris Piper	3	-	5	-
Cara	4	1	-	-
Home Guard	5	2	2	-
Pentland Dell	6	7	-	-
Golden Wonder	7	13	5	5
British Queen	13	14	12	11
Record	25	18	8	6
Kerrs Pinks	30	25	26	25
Saturna	-	6	4	-
Rooster	-	14	27	31
Lady Rosetta	-	-	5	5
Other Maincrop	6	-	6	4
Other Processed	-	-	-	18

Source: An Bord Glas/DAF Surveys

In Ireland the Teagasc Crops Research Centre in Oakpark, Carlow is responsible for potato breeding with thirty varieties released in the past 40 years from its programme. Fifteen of these varieties are grown commercially at present of which Rooster and Cara have are the most successful. Rooster is now the most popular variety sown in Ireland while Cara has been a popular maincrop variety in England. Cara now represents about 3% of the total maincrop potatoes grown in Great Britain having fallen by over half from last year. A breakdown of the Teagasc varieties gown for ware in Ireland and Great Britain is given in Table 19.

Table 19: Varieties grown for ware in Ireland and Great Britain in 2002

	Ireland	GB
Teagasc bred varieties	4289	2675
Other Varieties	9142	119432
Total	**13431**	**122107**
Teagasc Varieties as % of total	**32%**	**2%**

Source: DAF, British Potato Council

The process of breeding, testing and multiplying a new potato variety from the initial stages to the production of a commercial product takes about fifteen years. Since 1972, Teagasc has a contractual agreement with Irish Potato Marketing (IPM) Ltd. under which IPM has the sole marketing rights for these varieties. In return, IPM pay Teagasc a proportion of all royalties collected on seed grown in addition to a standard amount towards the cost of the programme. At present IPM owns 18 Teagasc bred varieties with an annual seed production of some 30,000 tonnes which is sold to 30 countries. Only a small proportion of this is now

grown in Ireland with the vast majority grown in Scotland where IPM has relocated its operations. Like Ireland, Scotland is recognised as a high plant health zone within the EU.

Teagasc varieties account for 18% of the area grown for seed in Ireland and 9% in Scotland (Table 20). However, as seen in the previous Tables 10 and 11, Teagasc varieties have the highest proportion of the third country export market with over 16,000 tonnes of seed exported to these markets in 2002, an increase of 25% on the previous year.

Table 20: Certified Seed Area in Ireland and Scotland in 2002

	Ireland (hectares)	Scotland (hectares)
Teagasc Varieties	**283**	**1123**
Other Varieties	1256	11720
Total	1539	12849
Teagasc as % of Total	18%	9%

Source: DAF, Scottish Agricultural Science Agency

Chapter 2

Programmes operated by the Department of Agriculture and Food in the potato sector – their basis, inputs, resources and outputs and evaluation

There are six state funded measures operated by the Department of Agriculture and Food in the potato sector. In addition, Bord Glas and Teagasc, the two State Agencies which come under the aegis of the Department, carry out programmes in the potato sector . The Department also co-operates with other Government Departments and agencies in relation to food safety and environmental issues. These other schemes are outlined in Chapter 3

The Department schemes are as follows:

1. **Registration and Marketing Standards**
2. **Plant Health Controls**
3. **Grant Assistance for the Potato Sector**
4. **Potato Variety Evaluation programme**
5. **Seed Production and Certification Services**
6. **Plant Breeders Rights**

A breakdown of the Department structure under which these schemes function and the staff involved is outlined in Diagram 2 over. The number of staff in the four Divisions and the number of Man Work Units involved in potatoes and other schemes is outlined in the Table 21 below. A further breakdown of staff allocation to the various schemes is given in Annex 5.

Table 21: Breakdown by Division of Staff involved in potato schemes and other schemes (2002)

Division and Potato Schemes	**Total No Staff in Division** (A)	**No Staff on potato schemes**		**No staff on potatoes on other schemes (MWU)** (D)	**Potato schemes as % of total**	
		No staff (B)	**MWU** (C)		**C/A X100**	**C/B X100**
Horticulture and Plant Health Division • Registration and Marketing Standards • Plant Health Controls • Grant Assistance (potatoes)	22	20	3.81	16.19	17.3%	19%
Variety Testing Division • Potato Variety Evaluation programme	29	10	2.23	7.77	7.7%	22.3%
Seed Certification Division • Tops Centre/Production of Pre-basic Seed • Seed Potato Certification Services • Plant Breeders Rights	75	43	36.09	6.91	48.1%	83.9%
Crop Production and Safety Division	28.5	5	2.78	2.22	9.7%	55.6%
Total	**149.5**	**78**	**44.91**	**33.09**	**26.6%**	**57.6%**

The total number of staff working on potato schemes is equivalent to 44 fulltime staff representing a little under 27% of the time of the 150 staff employed in the four Divisions involved and 58% of the actual time of the 78 staff directly involved.

A regional breakdown by grade and location is outlined in Table 22

Table 22: Breakdown of Staff by grade and location

Location	SI	AI	AAI	AS	DS	SAO	TAO	Lab	Igr	Admin	Total
Maynooth	1	1		1						5	8
Backweston	2	3	3	1			1		6		16
Dublin						6	1				7
Meath							1				1
Louth					1		1				2
Offaly							1				1
Wexford							1				1
Kilkenny			1								1
Waterford						1					1
Cork			1			2	2				5
Tipperrary					1						1
Limerick						1					1
Galway					1	1	1				3
Roscommon						1					1
Leitrim			1								1
Sligo						1					1
Donegal		1	1		5		13	2	4	1	27
Total	**3**	**5**	**7**	**2**	**8**	**13**	**22**	**2**	**10**	**6**	**78**

The breakdown by grade is Inspectorate19%,Technical 60%, Industrial 13% and administrative 8%. Over 34% of the staff are based in Donegal, 30% in Kildare, 16% in the rest of Leinster, 10% in Munster and 7% in Connacht.

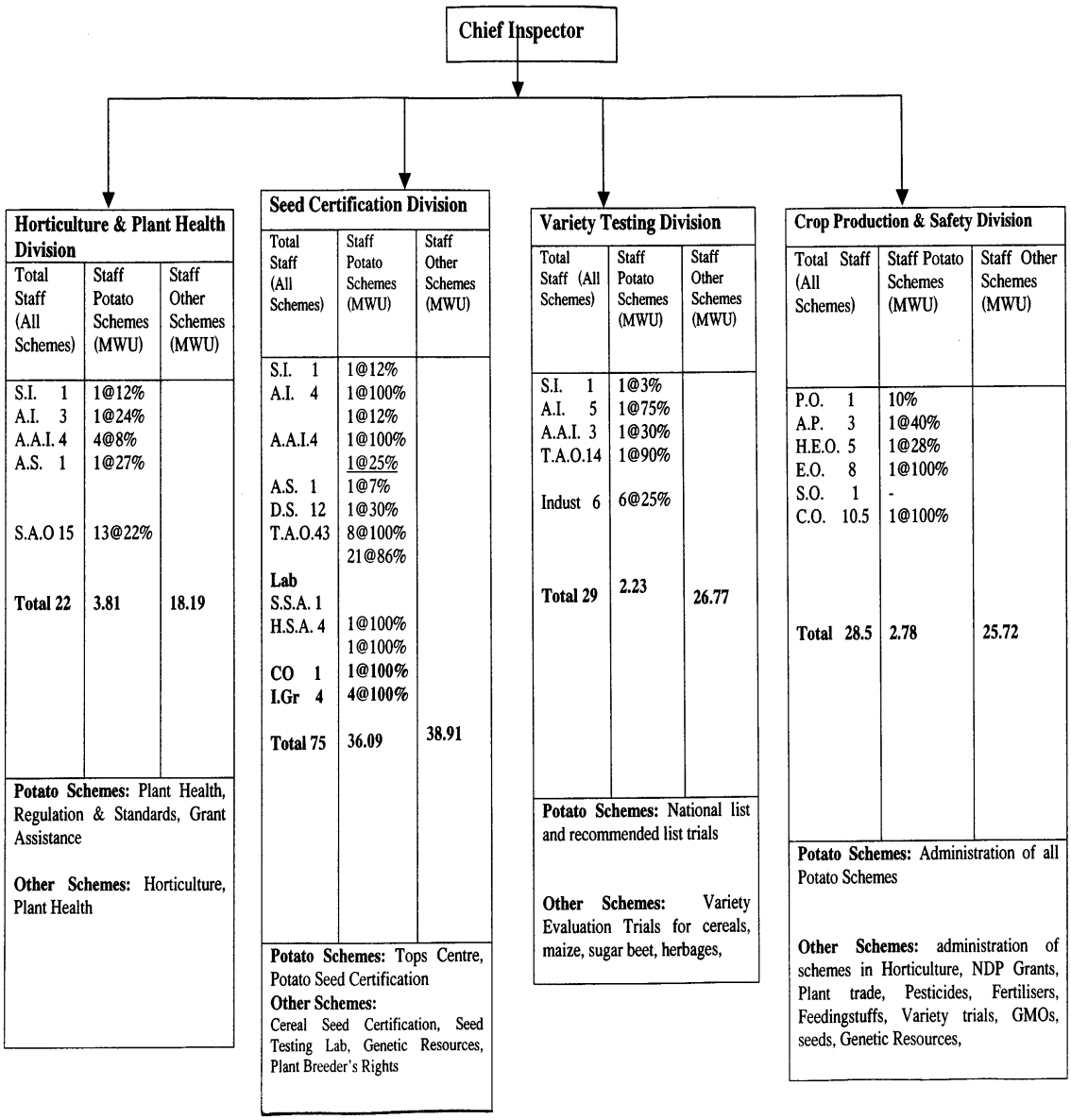
Physical Resources

The non staff resources used are the Tops potato centre in Raphoe, Co. Donegal and the Backweston Centre in Leixlip, Co. Kildare**.** The land, laboratories, equipment, etc., in these centres and their estimated value are outlined in Table 23.

Table 23: Department Resources used in potato schemes

Resources	Description	Value
Tops ▪ Land ▪ Buildings ▪ Equipment	80 Hectares Laboratories/glasshouses, farm buildings Laboratory, farm machinery	€2.5m (estimate)
Backweston ▪ Land ▪ Buildings ▪ Equipment	150 hectares of which 1 hectare is used for potato variety evaluation laboratories, farm buildings farm machinery	€0.5m (estimate)

Diagram 2 Staff Organisation Chart



2.1 Registration Regulations & Standards

2.1.1 The Registration of Potato Growers and Potato Packers Act, 1984.

Under this Act any person who grows or packs ware potatoes must be registered with the Department and the registration number must appear on the bag/label. Growers and packers must maintain detailed records of quantities sold and purchased. This register also cross complies the European Plant health Directive 2000/29 with the requirement in Annex IV Part A Section II 18.5 which states that '*There shall be evidence by a registration number put on the packaging or in the case of loose-loaded potatoes transported in bulk, on the vehicle transporting the potatoes, that the potatoes have been grown by an officially registered producer, or originate from officially registered collective storage or dispatching centres located in the are of production, indicating that the tubers are free from '<u>Pseudomonas</u> <u>solanacearum</u>'.*

The Registration of Potato Growers and Potato Packers Act, as amended in 2001, prescribed certain additional information relating to **seed potatoes** acquired for planting. The Act prescribes that each registered grower keeps the following records:

(a) the date, quantity and variety of each lot acquired for planting
(b) the class, the growers number and country of production displayed on the official label accompanying the lot
(c) the varieties of the potatoes planted by the registered grower and the area planted with each variety
(d) the yield from the area planted
(e) for each sale of potatoes by the registered grower, the quantity and variety of potatoes sold
(f) the date of each sale
(g) the names and addresses of persons to whom potatoes are sold by the registered grower in the course of business other than for consumption by the buyer.

Every registered packer is required to keep the following records:

(a) the quantity of each variety of potatoes packed by the registered packer each day
(b) the quantity and variety of potatoes involved in each purchase and sale of potatoes by the registered packer
(c) the date of each transaction
(d) the names and addresses of persons from whom potatoes are bought by the registered packer and to whom potatoes are sold by the registered packer in the course of business other than for consumption by the buyer
(e) whether potatoes bought by the registered packer had already been packed

Officers of the Plant Health and Horticulture Division carry out inspections at wholesale and retail level to check for compliance with the provisions of the Act. Action is taken where breaches of the regulation occurs.

2.1.2 The Food Standards (Potatoes) Regulations 1977 to 2003.

These Regulations prescribe the minimum quality and grading standards for ware potatoes sold for human consumption. Under these Regulations, the size of potatoes being marketed is regulated and the bag/label must show the size range and the variety of the potatoes.

Officers of the Horticulture and Plant Health Division carry out over 600 wholesale and 1500 retail inspections each year. In addition, officers of the Seed Certification Division carry out inspections under these Regulations at farm level - a total of 1399 inspections were carried out in 2002 (see Section 2.5.2).

A breakdown of the potato inspections carried out in wholesale and retail premises since 1998 is given in Tables 24 and 25. The inspection involves checking compliance with relevant legislation in relation to quality and grading standards of ware potatoes sold for human consumption. Breaches of the Regulations are followed up by warning letters. Prosecutions may be taken in certain cases.

Table 24: Wholesale potato inspections 1998-2002

Year	Inspections	No. Items Examined	No. Defects Detected	No Further Action	Verbal Warning	Letters Recommended	Non Conforming letters
2002	808	3757	419	1777	134	2	7
2001	523	2261	217	740	81	15	2
2000	714	3153	321	1807	78	5	10
1999	760	3801	575	1357	160	1	-
1998	679	2785	557	463	60	-	-

Source: DAF

Table 25: Retail potato inspections 1998 - 2002

Year	Inspections	No. Items Examined	No. Defects detected	No further action	Verbal warning	Letters recommended	Non conforming letters
2002	1610	6608	954	1397	334	14	60
2001	1310	5189	821	899	148	15	37
2000	1425	4876	863	990	270	10	20
1999	1999	6613	1091	1553	502	60	-
1998	1691	5483	848	375	292	2	2

Source: DAF

The above inspections are carried out in conjunction with the fruit and vegetable inspections required under Regulation EC1148 (2001)

A breakdown by county of the number of retail and wholesale premises on the Department's list of premises is provided in Table 26. This Table also shows the number of inspections carried out in 2002 to check compliance with the labelling/standards regulations for potatoes and fruit and vegetables.

Retail Premises
A total of 2286 visits were made by the Horticulture/Plant Health inspectorate to retail premises in 2002 in respect of the 2214 premises on the DAF inspection list.
During these visits 1610 inspections were carried out to check compliance with the potato labelling/standards regulations and 2286 inspections of fruit and vegetables.

Wholesale premises
A total of 1797 visits were made to 211 wholesale premises in 2002 to check the potato and fruit&vegetable labelling/standards. There were 808 inspections carried out on potatoes and 1584 on fruit and vegetables.

Table 26: Total number of retail/wholesale inspections for standards

District	Retail Premises				Wholesale Premises			
	Total No Premises	**No of Potato Inspections**	**No Fruit & Veg Inspections**	**Total No of Visits**	**Total No Premises with Potatoes and/or Fruit & Veg**	**No of Potato Inspections**	**No of Fruit & Veg Inspections**	**Total No of Visits**
North West								
Donegal	39	7	39	39	2	18	-	18
Sligo	22	13	38	38	4	119	3	119
Leitrim	20	16	22	22	1	14	1	14
Mayo	74	28	60	60	7	6	5	6
Galway	119	73	175	175	13	15	137	137
Roscommon	30	13	23	23	5	6	3	6
Total	**304**	**150**	**357**	**357**	**32**	**178**	**149**	**300**
South West								
Cork	646	318	392	392	25	39	129	129
Kerry	132	17	81	81	17	2	3	3
Limerick	124	58	50	58	10	116	116	116
Clare	79	59	9	59	5	1	-	1
Total	**981**	452	**532**	**590**	**57**	**158**	**248**	**249**
Midlands/South	30	20	20	20	8	29	29	29
Kilkenny	48	5	-	5	9	47	39	47
Waterford	17	8	41	41	3	-	-	-
Carlow	78	89	11	89	8	2	-	2
Tipperary	**173**	**122**	**72**	**155**	**28**	**78**	**68**	**78**
Total								
East/South								
Dublin(south)**	103	151	241	241	29	154	516	516
Wicklow	80	67	126	126	4	5	-	5
Wexford	21	44	123	123	7	4	6	6
Total	**204**	**262**	**490**	**490**	**40**	**163**	**522**	**527**
North/East								
Monaghan	40	9	23	23	1	-	-	-
Cavan	67	76	102	102	4	49	7	49
Longford	35	31	32	32	1	4	6	6
Westmeath	67	49	50	50	4	2	-	2
Total	**209**	**165**	**207**	**207**	**10**	**55**	**13**	**57**
Midlands/North	80	74	55	74	4	1	5	5
Kildare	43	36	35	36	1	-	1	1
Laois	50	60	158	158	3	7	5	7
Offaly	**173**	**170**	**248**	**268**	**8**	**8**	**11**	**13**
Total								
East/North								
Dublin(north)*	102	151	242	242	30	154	516	516
Meath	46	87	94	94	3	7	41	41
Louth	22	51	44	51	3	7	16	16
Total	**170**	**289**	**380**	**387**	**36**	**168**	**573**	573
Overall Totals	**2,214**	**1,610**	**2,286**	**2,454**	**211**	**808**	**1,584**	**1,797**

Source: DAF

** Estimated (Dublin North and Dublin South divided equally)

2.1.3 Outputs and Outcomes

A summary of the outputs and outcomes of schemes for the implementation of the Registration and Standards Regulations is outlined in Table 27.

Table 27: Outputs and Outcomes of the Potato Registration and Standards Regulations

SCHEME/ACTIVITY	NO. OF OUTPUTS	OUTCOMES	TRENDS
Registration Regulations	… Growers/Packers Registered	System provides traceability of product back to grower/packer, who must keep detailed records of quantities sold and purchased.	The number of registered growers/packers has increased by7% between 1998 (2190) and 2002 (2351).
Standards for sale of Potatoes - Quality control at wholesale and retail level	600 inspections per annum carried out at wholesale level. 1500 inspections per annum carried out at retail level	The system ensures ongoing delivery to the consumer of named varieties of potatoes, which are of consistent quality and size.	Ongoing monitoring of standards

2.1.4 Cost of Resources

Staff Costs

The staff involved in carrying out the inspection duties outlined above are based in the Horticulture and Plant Health Division with Administrative back-up provided by Crop Production and Safety Division. The Seed Certification Division also carries out activities under these regulations, the operation and cost of which are covered in Section 2.7 A breakdown of the costs of implementing the regulations in retail and wholesale premises is outlined in Table 28.

The average cost of each potato inspection covering technical and administrative costs was €66 in 2002.

Table 28: Staff costs of Potato (Registration/ Standards) inspections at retail and wholesale premises

District/Location	No Staff/ Grade	Total costs of staff in Column 2	Staff costs associated with Registration and Standards		Cost of inspections	
			€	% of total	No of inspections Retail and Wholesale	Cost of each inspection
Inspectorate Staff						
North/West Donegal, Sligo, Leitrim, Mayo, Galway	2 SAO	129,539	14,249	11%	328	43
South/West Cork, Kerry, Limerick, Clare	3 SAO	192,294	21,152	11%	610	34
Midlands/South Kilkenny, Waterford, Carlow, Tipperary	1 SAO	62,324	6,856	11%	200	34
East/South Dublin(south), Wicklow, Wexford	4 SAO	254,266	27,969	11%	425	48*
North/East Monaghan, Cavan, Longford, Westmeath	1SAO	62,515	6,877	11%	220	31
Midlands/North Kildare, Laois, Offaly		-	-	-	178	
East/North Dublin(north), Meath, Louth	2 SAO	129,539	14,249	11%	457	48*
Inspectorate Staff Maynooth	1SI, 1AI, 1AS,	249,772	26,468	11%	2418	11
Total Inspectorate staff	**1SI, 1AI, 1AS, 13 SAO**	1,080,249	117,820	11%	2418	49
Total Administrative Staff (Maynooth)	**1 PO, 1 AP, 1 HEO, 1 EO, 1 CO**	308,761	40,868	13%	2418	17
Total staff Costs		1,389,010	158,506	11%		66

Source: DAF

* Estimated as Dublin North and Dublin South are divided equally. See Table 26.

2.1.5 Evaluation

Inspections and Compliance

In 2002, the 13 Senior Agricultural Officers in the Horticulture and Plant Health Division carried out 4083 visits to retail and wholesale premises to check compliance with the Food Standards (Potato) Regulations 1977, as amended, the Registration of Potato Growers and Packers Act 1984 and the EU Fruit and Vegetable Regulation 1148/2001. In the course of these visits 1610 inspections of potatoes were carried out in retail premises and a further 808 in wholesale premises.

The total number of premises on the Department's database[5] for potatoes, fruit and vegetables is 2214 retail and 211 wholesale. The inspection intensity is under 1 inspection per year for each retail premises and 4 per year for each wholesale premise.

[5] Database set up in fulfilment of requirements of Article 3 of Commission Regulation EC No 1148/2001 on checks on conformity to the marketing standards applicable to fresh fruit and vegetables. The Regulation came into effect on 1 January 2002

The number of potato inspections carried out at retail level in 2002 was somewhat similar to previous years but the number of wholesale inspections was the highest in the period. Under the Food Standards (potatoes) Regulations, sellers of potatoes must comply with minimum standards regarding size, absence of defects etc and provide information on the container or the label on the name and address of the packer, the variety and the size of the potatoes. Under the Registration of Growers and Packers Act, inspectors check to see that the registration number of the grower or packer is on the bag of potatoes.

In 2002 officers examined 10,365 potato items (bags etc) in both wholesale and retail premises and made 1375 detections of non-compliance items. Most of these defects were dealt with on the spot by the inspector with the more serious transgressions referred to Crop Production and Safety Division who issued warnings by letter. There have been no prosecutions to date under any of the two pieces of legislation.

The potato standards regulations which arise from national legislation do not specify what level of inspections should be carried out or where in the potato supply chain they should be targeted. The potato regulations differ from those governing marketing standards for fruit and vegetables which are governed by EU legislation. Under the latter member states are obliged to specify the frequency of inspection and sampling using risk analysis techniques to ensure compliance with the standards. Article 4 of Regulation 1148/2001 states ' *This risk analysis will relate, in particular, to the size of the firms, their position in the marketing chain, findings made during previous checks and other possible paramaters to be defined by Member States. Traders involved in preparing and packaging fruit and vegetables, particularly in the production region, shall be subject to a higher rate of checks than other categories of trader. Checks may also occur during transport.'* The fruit and vegetable regulation also sets out in an Annex the methods of carrying out conformity checks except for those at the point of sale where Member States can lay down their own specific arrangements.

Inspections of potatoes to check compliance with the legislation is not based on risk analysis. The total number of inspections carried out is disproportionate to the possible level of breaches likely to occur. As outlined in Table 26 many wholesale premises are inspected monthly or more frequently. While the number of defective items detected over the five year period as outlined in Tables 24 and 25 were of the order of 13% and 16% for wholesale and retail premises, respectively, none of the regulatory breaches were so serious as to warrant prosecution.

The number of inspections carried out by the Department must be examined against the changes which have taken place in the sector over the past decade. These changes relate to the concentration of supplies in the retail sector and the development of quality assurance schemes.

As outlined in section 1.3 of this report, buying power is now concentrated in the hands of 5-6 multiple retailers who control 65-70% of the ware market. Over the last 5 years these multiples have consolidated their supply base in five potato pre-packers who in turn are supplied by large specialised growers. Consumer driven demands for the highest standards of food safety and quality has pushed most businesses down the quality assurance road. The Bord Glas Quality Programme which has been developed over the last 10 years to meet these consumer demands has now all the major potato packers participating in the scheme along with 145 growers who represent 45% of the ware potato area in the country. The standards of the Bord Glas programme are based on legislative, best practice and market requirements. Each participating grower and wholesaler/pre-packer undergoes two independent audits by Bord Glas appointed auditors each year.

Food Labelling Report

The Food Labelling Report[6] identified a number of weaknesses in the policy and enforcement of labelling legislation and recommended that *'the Food Safety Authority should have overall responsibility for the general and related specific labelling legislation by way of 'service contracts' with the enforcement agencies. Synergies between the agencies, the avoidance of overlap and the use of risk management techniques should be key factors in ensuring an efficient and effective enforcement strategy'.*

The labelling regulations governing pre-packaged potatoes come under the general labelling legislation in Council Directive 2000/13/EC and the specific legislation in the Food Standards (Potatoes) Regulations outlined above. The general labelling Directive covers such things as the name of the product, the net quantity, the date of minimum durability, etc and is enforced by Environmental Health Officers (EHOs) under 'Service Contract'[7] to the Food Safety Authority (FSAI). EHOs carry out their labelling inspections in retail premises and other point of sale outlets in conjunction with other inspections for which they are mandated. In 2001 the total number of such inspections carried out by Health Board officials amounted to 37,807 while Department of Agriculture and Food officials carried out 1310 inspections of potatoes in retail premises in the same year in addition to those on fruit and vegetables.

The implementation of the recommendations in the Food Labelling Report would avoid such overlap between the inspection authorities and allow for the more efficient use of staff resources.

The Minister for Agriculture and Food has accepted the recommendation in the Report that the FSAI should be responsible for all labelling enforcement. Arising from this decision the labelling legislation related to potatoes, fruit and vegetables will be included in Service Contract between the Department and the FSAI. This will provide for the rationalisation of the service and the operation of a risk based inspection system. In the drawing up of risk criteria, participation in the Bord Glas Quality Programme will be an important factor which can further reduce the need for inspections including those at the grower/packer stage. In 2002, 1399 inspections of ware potatoes at farm level to check compliance with the Potato Standards Regulations and the Growers and Packers Act were carried out by officers of the Seed Certification Division at a cost of €45,000. (See Section 2.5.2)

The establishment of an up-to-date database on all growers and packers will be an essential requirement in the development of a risk based inspection system

Resource Impact and Outcomes

The changes above would considerably reduce the need for Department inspections at retail level and reduce the number of inspections in wholesale premises to a fraction of the current level. The need to maintain the highest degree of compliance with the regulations under this new arrangement would be paramount and in this regard the need for fully trained inspectors would be essential.

Inspection costs, which were of the order of €118,000 in 2002, incurred by Horticulture and Plant Health Division, would be reduced considerably. Further cost reductions would be effected by having centralised enforcement across the full supply chain from grower to retailer under a single Division, i.e.Horticulture and Plant Health Division. The costs of

[6] Report of the Food Labelling Group (December 2002)

[7] The FSAI has responsibility for the enforcement of Food Safety Legislation and it carries out this function by Service Contracts with all the State Agencies. The Department of Agriculture and Food contract covers Meat Hygiene, Dairy Products, Eggs and Egg Products, Pesticides, Beef Labelling and other areas.

€45,000 which are incurred by Seed Certification Division in carrying out inspections of ware growers would be assimilated into Horticulture and Plant Health Division.

A summary of the outcomes and cost savings are outlined in Table 29.

Table 29: Summary of Outcomes

Proposal	Comment	Financial Implications
Food Standards (Potatoes) Regulations to come under a Service Contract with the FSAI. Horticulture and Plant Health Division to have responsibility for the enforcement of the Food Standards Regulations and the Growers and Packers Act across the whole supply chain.	**-Inspections to be based on risk assessment** **-reduction in number of inspections** -More efficient use of staff resources and development of synergies between inspection agencies	**Costs of inspections reduced below €100,000.** **(See Table 102 for savings in Seed Certification Division)**

2.2 Plant Health Controls

2.2.1 Legislative Basis

EU plant health legislation requires that member states carry out surveys for certain specified quarantine organisms. These duties are carried out by the inspectorate staff in Horticulture and Plant Health Division.

EU Legislation

- Council Directive 2000/29 on protective measures against the introduction into the community of organisms harmful to plants or plant products and against their spread within the Community.
- Council Directive 93/85/EEC on the control of potato ring rot. This Directive includes a provision that annual surveys for the causative organism be carried out.
- Council Directive 98/57/EC of 20 July 1998 on the control of *Ralstonia solanacearum* (Smith) Yabuuchi et al. This Directive includes a provision that annual surveys for *Ralstonia solanacearum* be carried out.
- Council Directive 69/465/EEC on the control of Potato Cyst Eelworm. Plant material moving within the EU is required to be free from potato cyst eelworms.
- Council Directive 69/464/EEC on the control of Potato Wart Disease.

National legislation:

- European Communities (Introduction of organisms harmful to plants or plant products) (Prohibition) Regulations, 1980 (as amended). These regulations transposed the requirements of EU plant health legislation into national legislation.
- Colorado Beetle Order 1945
- Potato Root Eelworm Order, 1951

2.2.2 Plant Health Inspections: Potatoes

Under EU plant health legislation, member states are required to carry out surveys or monitor quarantine harmful organisms.The quarantine organisms relevant for potatoes are: Potato stolbur, *Clavibacter michiganensis* ssp. *sepedonicus* (which causes Potato Ring Rot), *Ralstonia solanacearum* (which causes Potato Brown Rot), *Synchytrium endobiotricum* (cause of Potato wart disease), Potato cyst nematodes: *Globodera rostochiensis* and *Globodera pallida,* Root Knot nematodes *Meloidogyne chitwoodi* and *Meloidogyne fallax, Ditylenchus destructor* (the Potato tuber-rot nematode), *Leptinotarsia decemlineata* (Colorado beetle), Beet necrotic yellow vein virus (not harmful to potatoes but soil attached to potatoes can carry the vector of this virus).

The surveys for the above the above organisms are carried out by officers in the Horticulture and Plant Health Division in conjunction with routine inspections of fruit and vegetables at retail and wholesale level. Inspections for the above organisms at farm level are carried out by the Potato Seed Certification Officers. This is considered further in Section 2.5.2.

The number of inspections and sampling for potato pests/diseases carried out since 1998 when these activities were transferred from the Potato Inspectorate are outlined in Tables 30 and 31.

Table 30: Colorado Beetle Inspections 1998-2002

Year	Visits*	No. Beetles Found	Action taken
2002	1001	3	Destroyed
2001	751	2	Destroyed
2000	946	1	Destroyed
1999	704	0	NA
1998	901	4	Destroyed

Source; DAF

*The above inspections are carried out as part of duties on fruit and vegetables quality standards monitoring work.

Table 31: Samples analysed for Brown Rot, PCN and Beet Necrtotic Yellow Vein Virus 1998 –2002

Year	No. Water Samples analysed for Brown Rot	No. samples of imported potatoes analysed for Brown Rot	No samples of imported potatoes analysed for PCN	No samples of imported potatoes analysed for Beet Necrotic Yellow Vein Virus	Total no samples taken and analysed
2002	21	62	142	193	418
2001	17	104	132	186	439
2000	20	65	106	159	350
1999	NA	40	129	123	292
1998	NA	60	110	141	311

Source: DAF

A summary of the outputs and outcomes from the Plant Health Inspectorate in 2002 is given in Table 32.

Table 32 Summary of Outputs and Outcomes of the Plant Health Inspection Service for potatoes

SCHEME	OUTPUTS	OUTCOMES	TRENDS
Plant Health Controls Carried out by officers of Department staff in the course of implementing the marketing standards at wholesale and retail level	. 800 inspections of imported produce for Colorado Beetle were carried out in 2002 . 100 samples of ware potatoes from OMS and third countries for quarantine pests were taken . 21 water samples were taken to test for Brown Rot . 142 PCN samples were taken from potatoes from OMS and Third countries . 193 samples taken for beet necrotic yellow vein virus	Improved disease control and protection of Ireland's status as a high grade potato production region Implementation of a contingency plan for both Brown rot and ring rot of Potatoes. Monitoring for quarantine pests targeted to prevent introduction of harmful organisms.	Plant Health status of the country is maintained
Officers of the Seed Certification Division also carry out Plant Health controls in the course of their activities	See Section 2.7		

2.2.3 Resources

The resources employed in delivering the above plant health services involve staff and laboratory resources.

The staff resources are based in the Horticulture and Plant Health Division with administrative back-up provided by Crop Production and Safety Division. The number of staff and their cost is outlined in Table 33.

The total costs, including administrative costs, of the plant health controls for potatoes in 2002 was €127,316. The average staff cost (inspectorate) of each sample taken for the 418 samples was €304.

Table 33: Staff Costs of Plant Health controls in potatoes 2002

District/Location	No Staff/Grade	Total cost of staff in Column 2	No of potato samples taken	Costs of potato inspections	
				€	% of total costs
Inspectorate Staff					
North/West Donegal, Sligo, Leitrim, Mayo, Galway	1AAI, 2 SAO	202,313		16,644	8%
South/West Cork, Kerry, Limerick, Clare	1AAI, 3 SAO	266,350		23,688	9%
Midlands/South Kilkenny, Waterford, Carlow, Tipperary	1AAI, 1 SAO	133,726		9,100	7%
East/South Dublin(south), Wicklow, Wexford	4 SAO	259,455		28,540	11%
North/East Monaghan, Cavan, Longford, Westmeath	1 SAO	63,791		7,017	11%
Midlands/North Kildare, Laois, Offaly	1AAI	70,130		2,104	3%
East/North Dublin(north), Meath, Louth	2 SAO	130,778		14,386	11%
Inspectorate staff (Maynooth)	1 SI, 1AI, 1AS	249,772		17,686	7%
Total Inspectorate Staff		**1,376,315**		**119,165**	**9%**
Total Administrative Staff (Maynooth)	1 PO, 1 AP, 1 HEO, 1 EO, 1 CO	308,761		8,151	3%
Total		**1,685,076**	**414**	**127,316**	**8%**

Other Costs

The major costs in plant health controls for potatoes are incurred by the Seed Certification Division. The technical staff costs in 2002 were €291,000 with additional costs of €160,000 for the analysis of samples for Potato Root Nematode bringing the total to €451,000. These costs are outlined in detail in section 2.6.

Other costs incurred by the state are for analysis of samples for Brown Rot etc. These costs are borne free of charge by the State laboratory. See Section 3.3.

2.2.4 Evaluation

Retention of High Health Status

The plant health controls carried out by staff in the Horticulture and Plant Health Division are critical functions for the maintenance of the countrys' high health status. Ireland has protected zone status for Colorado Beetle and is one of a number of areas deemed to be a high grade seed area. The other high grade seed areas are Northern Ireland, Scotland, Northern England (Cumbria and Northumberland) and parts of Germany and Finland. A protected zone is a zone in the Community where it is shown by surveys that harmful organisms are not established.

The plant protection services in all Member States are obliged under EU legislation to carry out inspections and surveys under a set procedure. In the case of areas with protected zone status a more thorough survey has to be conducted for the relevant organisms. In areas where a disease is present more intensive surveys have also to be carried out. The average number of samples taken in Ireland has remained relatively constant as the surveys are statutorily obliged under both EU and national legislation.

Oficers of the Seed Certification Division are also involved in surveying for Potato Brown Rot, Potato Ring Rot and Potato Tuber Rot Nematode. This work is co-ordinated with Horticulture and Plant Health Division to avoid duplication visits to survey sites.

The results of the surveys are forwarded to the EU Commission and submitted to the EU Standing Committee on Plant Health for examination, and follow up action if necessary.

Alternatives
All Member State are obliged to have a plant health control system in place and enforce all EU legislation. Failure to do so would result in refraction procedures taken by the Commission against the Member State in question.

Some Member States - Germany, Italy, UK, Austria and Spain - have a national plant health service in charge of co-ordinating the activities of the various regions with the other Member States having a centralised plant health control system similar to Ireland.

Food and Veterinary Office

The Food and Veterinary Office of the EU Commission carry out missions to Member States to examine the implementation of the plant health legislation. The most recent FVO report '*On a mission carried in Ireland in order to audit the plant health system in the potato sector'* gave a favourable overview of the controls in place.

2.2.5 Outcomes

In the evaluation of the above programme, the EU Regulatory obligations and the need to retain the country's high health status are primary considerations. The controls operated by officers of the Horticulture and Plant Health Division are part of their overall plant health work and represent only a small compared to the costs of the plant health services provided by the Seed certification Division. A rationalisation of these services, which cost €450,000 in 2002, would effect substantial cost reductions. This is examined in Section 2.5.2.

A summary of the outcomes arising from the above evaluation is outlined in Table 34

Table 34: Summary of Outcomes

Proposal	Comment	Financial Implications
Horticulture and Plant Health Division to continue existing arrangements	**The plant health controls carried out on potatoes by staff of the Horticulture and Plant Health Division are governed by EU regulations. The staff resources devoted to potatoes represent 8% of the total costs of the officers involved.**	**The estimated costs of the inspections by Horticulture and Plant Health Division was €119,000. There is little scope for reduction in these costs.** **Costs of plant health controls in the Seed Certification Division were €450,000 in 2002. Some reductions can be effected in this area.**

2.3 Grant Assistance

2.3.1 Programmes
The Department of Agriculture and Food operates schemes for aiding capital investment in the Potato sector. These schemes are designed to improve the processing and marketing infrastructure of the potato sector.

The **Operational Programme for Rural Development from 1992 to 2000** provided grant aid towards investment in facilities for the commercial production, storage and marketing of seed and ware potatoes, in particular new storage, refrigerated storage and the purchasing of weighing and grading equipment.

The **National Development Plan, 2000 – 2006,** provides grant aid aimed at improving efficiency, reducing losses, ensuring the marketing of quality product, and extending the marketing season for the potato crop, thereby reducing seasonal dependency on imports and improving the competitiveness of Irish producers. This grant aid has been available for the development of modern handling and packing equipment, and for investment in ambient and refrigerated storage facilities.

As outlined in Table 35, total grant aid paid to the sector between 1992 and 2002 was €19.81m. Under the EU FEOGA grant aid scheme for marketing and processing, which is administered by Food Division, total grant aid amounted to €13.62m of which €9.75m came from the EU and €3.87m from Enterprise Ireland. The grant ant aid scheme for on farm storage, ancillary facilities administered by Crop Production and Safety Division amounted to €6.2m over the period.

Table 35:

Grant Aid to the Potato Sector 1992-2002

Year	Yearly Feoga Payment DAF	Yearly Feoga Payment Enterprise Ireland	Yearly total DAF & EI	Yearly total BMW	Yearly total SE	Total BMW + SE	Grand Total: Food Div & Potato Sec
	Euro	Euro	Euro	Euro	Euro	Euro	Euro
	Food Div	Food Div	Food Div	Potato Sec	Potato Sec	Potato Sec	
1992	428,058	297,180	725,238	600,000	717,000	1,317,000	**2,042,238**
1993	1,073,854	13,700	1,087,554	167,000	395,000	562,000	**1,649,554**
1994	667,078	154,499	821,577	59,000	211,000	270,000	**1,091,577**
1995	557,909	955,208	1,513,117	100,000	159,000	259,000	**1,772,117**
1996	1,770,278	655,575	2,425,852	505,000	685,000	1,190,000	**3,615,852**
1997	1,367,383	1,341,058	2,708,441	78,000	181,000	259,000	**2,967,441**
1998	980,450	312,874	1,293,323	231,000	539,000	770,000	**2,063,323**
1999	1,006,514	140,292	1,146,806	165,000	323,000	488,000	**1,634,806**
2000	1,738,674	0	1,738,674	138,000	44,000	182,000	**1,920,674**
2001	0	0	0	140,000	191,000	331,000	**331,000**
2002	166,383	0	166,383	138,000	418,000	556,000	**722,383**
Grand Totals	**9,756,582**	**3,870,385**	**13,626,967**			**6,184,000**	**19,810,967**

A breakdown of the grant aid and the level of investment under the Structural Funds Programme 1990 –2000 and the NDP 2000- 2006 is outlined under.

1990-2000

Approximately IR£5.6m was paid out in grant aid to projects in the potato sector in the period 1992 to 2000 under the Operational programmes for Agriculture, Rural Development and Forestry. These grants related to investments of IR£12.3m in the sector representing about 45% of the investment costs.

Approximately IR£15.7m was awarded under the EU Marketing and Processing grant schemes which related to capital investment of IR£39m in the sector representing an average grant rate of 40%.

2001-2002

Under the National Development Plan 2000-2006 grant aid of €1.05m was paid in 2001 and 2002 under the NDP scheme.

A summary of the scheme outputs and outcomes provided in Table 36.

Table 36: Summary of outputs and outcomes from Grant Aid Scheme

SCHEME	INPUTS	OUTCOMES	TREND
Scheme of Investment Aid for the Potato Sector	A total of €19.8m has been paid in grant aid to the sector between 1992 and 2002. x Number of Inspections from 2000-2002 was 36.	Increase in storage capacity to 360,000 tonnes of which one-third is refrigerated. Improvement in overall infrastructure in grading and handling.	Since 2000 there has been a considerable reduction in grant aid to the potato sector. Grant aid in 2001 and 2002 was 83% and 63%, respectively, down on 2000. No grant aid was provided in 2003.

2.3.2 Resources

The grant aid scheme for on farm investment under the National Development Programme is administered by Crop Production and Safety Division and Food Division with technical input from Horticulture and Plant Health Division. The staff costs of operating the scheme in 2002 are presented in Table 37.

Table 37: Staff costs of NDP Grant aid Scheme for potato sector 2002

District/ Location	No Staff And grade	No Inspections /Visits	Total costs of staff in Column 2	Staff costs associated with Grant aid scheme	Grant Aid scheme as % of total costs
Inspectorate Staff (Horticulture and Plant Health Division Maynooth)	1 AI 1AS 1AAI	10	€219,243	€6,586	3%
North/West Donegal, Sligo, Leitrim, Mayo, Galway	1 AAI	-	€70,130	€3,507	5%
South/West Cork, Kerry, Limerick, Clare	1 AAI	3	€70,130	€3,507	5%
Midlands/South Kilkenny, Waterford, Carlow, Tipperary	1 AAI	-	€70,130	€3,507	5%
East/South Dublin(south), Wicklow, Wexford					
North/East Monaghan, Cavan, Longford, Westmeath					
Midlands/North Kildare, Laois, Offaly	1 AAI	1	€70,130	€3,507	5%
East/North Dublin(north), Meath, Louth					
Total Inspectorate Staff			**€499,763**	**20,614**	**4%**
Total Administrative Staff Crop Production and Safety Division (Maynooth)	**1 PO, 1AP 1EO, 1CO 1HEO**		**€308,761**	**10,868**	**3.5%**
Total administrative Staff Food Division	**1 HEO 1 CO**	**2**	**€88,098**	**11,263**	**13%**
Total staff			***€896,622***	***42,745***	***5%***

2.3.3 Evaluation

The main objective of the schemes is to aid capital investment projects for new or improved storage and marketing facilities with priority being given to temperature controlled storage, brushing, grading, packing, washing and weighing equipment. Under the farm investment scheme, the target group were mainly medium sized growers who had the critical mass to ensure that they could remain viable in the business. Eligibility criteria under the scheme required applicants to draw up business plans, comply with planning requirements and be sufficiently skilled in potato production and marketing. In addition, applicants were encouraged to join the Bord Glas Quality Programme.

The minimum investment aided under the NDP farm grant scheme is €10,000 with maximum eligible expenditure of €150,000. Investment projects above €150,000 are catered for under the Marketing and Processing Scheme administered by Food Division.

Impact of Schemes

The grant aid schemes have helped to modernise the sector and allowed for the marketing of ware potatoes all year round and added value to the potato sector. The recent An Bord Glas/DAF National Potato Census (2003)[8] showed that the national storage capacity for potatoes is now 362,000 tonnes of which ambient stores represent 36% of capacity and refrigerated stores 34% with 2% of capacity for storing processing varieties. The balance of 36% of capacity comprises non- specialised shed/lean-to buildings which have multi-functional use but less than ideal for storing potatoes.

A breakdown of the 800 potato growers in the country shows that over 700 have some type of storage facility with 240 growers having ambient or refrigerated stores. The construction of refrigerated stores has been the most important development under the grant aid schemes and these now account for a third of the storage capacity available and are owned by about 100 growers. In addition the development of specialised stores for processing varieties is on-going and these have increased two-fold over the past two years.

A review[9] of the potato and horticulture capital grant schemes, which was commissioned by An Bord Glas, was completed in January 2002. The report concluded that capital grant schemes were an important vehicle for the delivery of priority investments but that the funds currently available were inadequate to meet the needs of the industry. The report recommended the inclusion of value added potato projects within the scope of the Scheme. It added that the value added sector is a rapidly developing sector which is seeking to address the needs of the retail and food service sectors and 'Failure to address this need will restrict the development of this critically important sector'. As already outlined in Table 8 the export value of processed potatoes has increased by €11m over the past 10 years.

It is clear that the availability of grant aid has provided a catalyst for change and a move towards greater specialisation in the sector. While the exit of smaller or less efficient growers will continue it will be at a lower pace because of the stability brought about by the relatively sizeable investments incurred by all those who have remained and are committed to potato production.

[8] National Potato census 2003 (An Bord Glas/DAF)
[9] Review of Capital Investment Grant Schemes Supporting Horticulture for Bord Glas (January 2002) by Agenda Consulting.

Without grant aid there would be less investment in the sector with a bigger exit of the smaller grower- enterprises, in particular, from the sector. An examination of the applications and approvals for farm grant aid would help to bear this out. For example under the first round of the NDP Grant aid scheme covering the period 2001/2002 there were 140 applications for grant aid of which 20 were deemed ineligible. The remaining 120 applications represented investments totalling €10.99m. However, because of limited funds only 38 applicants were approved for investments of €3.37m in respect of the €1.2 m grant aid available. Of the remaining 82 applicants very few of them proceeded with their planned projects which required capital expenditure of the order of €7.6m and grant assistance of €2.6m.

The future capital investment requirements at farm level will be mainly for additional refrigerated storage and the development of specialised stores for processing varieties, the latter which are gaining in prominence. In addition, the need to provide capital grant aid for the processing/value added sector will be essential in ensuring that the potential of this rapidly expanding area is fully realised through its contribution to the Irish food industry and the wider national economy.

Administrative Costs of Scheme and costs of alternatives

The grant scheme for the potato sector is carried out by administrative and inspectorate staff of the Department in conjunction with other duties in relation to potatoes and horticultural products**.** The cost of administering the Scheme is broken down between the administrative staff and the Inspectorate staff outlined in Table 38.

Table 38: Costs of Administering grant aid schemes in 2002

Staff	Cost
Administrative	
• Crop Production and Safety	€10,868
• Food Division	€11,263
Inspectorate	€20,614
Total	€42,745

The schemes could be administered by an outside body, e.g. An Bord Glas, but it is unlikely that there would be any significant savings effected as additional staff and facilities would be required. It would not be possible for the Department to totally disengage from the Scheme as it would retain a policy role and would still be accountable for the funds, particularly where EU funds are provided.

2.3.4 Options and Outcomes

The Grant scheme for the potato sector has clearly been an important driver of change in the industry. Tangible results exist in the provision of modern infrastructure for a sector which is totally dependent on the market. Some grant aid should continue to be provided for refrigerated stores and other infrastructural features for growers and packers but the main focus should now be on grant aiding the processing and value added sectors of the potato industry.

The schemes are efficiently administered by the Department and there would be no efficiencies in transferring them to another agency.

A summary of the options and outcomes for the grant aid scheme is outlined in Table 39.

Table 39: Summary of Options and Outcomes

Proposal	Comment	Costs/savings
Administration **Continue with existing arrangements in:** -Crop Production and Safety Division, -Horticulture and Plant Health Division -Food Division	**These arrangements are effective and cost efficient**	**No change**
Funding **(a) Target funding at the processing and value added sectors and refrigerated storage on farms.**	**Increase in value added output and exports. Reduction in imports. Structural improvement of the sector accelerated. More growers remain in the sector.**	**Based on NDP funding 2000-2006**

2.4 Potato Variety Evaluation Programme

2.4.1 Objective

The specific objectives of the Potato Variety Evaluation Programme are: (1) to determine the **Value** for **Cultivation** and **Use** (VCU) of potato varieties with regard to yield, quality, disease and other agronomic traits, and (2) to further determine and publish the **Evaluation List of Recommended Varieties** most suitable for Irish farming conditions**.**

2.4.2 Legal Basis

The legal basis for the evaluation programme is based on ***Council Directive 2002/53/EC of 13 June 2000 on the Common Catalogue of Varieties of Agricultural Plant Species.*** Under this Directive all member states are obliged to compile a National Catalogue of varieties accepted for certification and marketing in their territories. The catalogues must be drawn up in accordance with uniform rules so that the varieties accepted will be **Distinct**, **Stable** and sufficiently **Uniform (DUS)** and that they will be of satisfactory value for cultivation and use **(VCU)**. Once a variety is accepted into the National Catalogue it can be entered in the EU Common Catalogue and such seed should be freely marketable within the Community.

Under **Statutory Instrument 525 of 2002**, which transposes Directive 2002/53 EC into national law, a potato variety eligible for entry in the National Catalogue must have been trialled for a minimum of two years in the Department's National List trials and have achieved a positive VCU following the results of these trials. The Department decides on those varieties which should enter into the National Catalogue following consultation with the Potato Advisory Committee[10] (annual Meeting). The variety is then notified to the EC Commission for inclusion in the Common Catalogue.

Each variety in the National Catalogue is listed with its name, maintainer, the year it was first registered in Ireland and, if appropriate, the year in which its registration has been renewed.

2.4.3 Reasons for Testing New Varieties

- To determine the Value for Cultivation and Use of each new variety
- To select varieties that perform well under Irish conditions
- To provide the primary producer with a guide to the merits of varieties that are marketed in Ireland
- To give the producer access to the most up to date progress in plant breeding
- To protect the producer from growing cultivars of inferior merit
- To provide a service for the VCU testing of Irish-bred varieties, thus facilitating their entry into trial programmes in other countries with a view to seed or product export

2.4.4 Selection of Varieties

The selection of varieties for trialling is based on the performance of a variety in the previous year's trials and on the assessment of the merits of new varieties submitted by agents and breeders. There were a total of 16 varieties selected for testing in the 2002 trials.

[10] The Potato Advisory Committee is comprised of Teagasc, Breeders, Seed Agents, University College Dublin, and Departmental staff.

Eight of these varieties were bred in Ireland by Teagasc, of which two (Cara and Rooster) are in commercial production. Of the remaining eight varieties, five were included as reference varieties for the various market outlets i.e. retail trade, chipping and crisping, while the remaining three were of foreign origin and assessed for suitability under Irish conditions. One of these (Lady Rosetta) is now included in the Irish National Catalogue.

A breakdown between Irish bred and foreign bred varieties over the period of the review is outlined in Table 40. The number of varieties trialled has fallen from 31 in 1992 to 16 in 2002. In recent years the programme has concentrated on testing Irish-bred varieties and a small number of foreign-bred varieties considered suitable for commercial production in Ireland.

Table 40: No of Potato Varieties Trialled 1992 – 2002

Year	1992	2002
No. of Varieties Trialled	31	16
No of Irish Bred Varieties	10	8
No. of Non-Irish Breeder Varieties	21	8
No. of Above on Common Catalogue	No record available	10

The number of varieties, broken down by crop type, entered for trialling between 1991 and 2001 is summarised in Table 41.

Table 41: No Varieties trialled 1992-2002

Crop	No varieties
First Earlies	13
Second Earlies	11
Maincrop	55
Total	**79**

2.4.5 Potato Variety Evaluation Procedure

To date, 'Maincrop' trials have been located at Backweston (HQ), Moorepark, Dublin, Meath and Donegal, representing the main potato growing areas of the country. 'First' and 'Second Early' trials are carried out at two locations in Cork and Backweston. Potato variety testing is an integral part of the overall variety testing programme which includes the main crops of commercial interest in Ireland.
Agronomic characteristics such as yield (total and marketable), disease assessments, tuber characteristics as required by different markets, etc. are assessed on each trial.
Data on quality analysis such as eating, chipping and crisping are carried out by Teagasc Research Centre, Oakpark, Carlow.
Potato variety testing is an integral part of the Department's overall crop testing programme.
Crop Production and Safety Division provide administrative support.

2.4.6 Analysis of Data

Annual data from each trial and across all sites is analysed statistically to determine varietal variation for a range of characteristics. The performance of varieties which have completed 3 years trialling is also analysed.

2.4.7 Publications

A ***Variety in Trials Booklet*** is published annually which includes details of all potato varieties trialled. The ***Irish Evaluation List of Recommended Potato Varieties*** (see sample page in Annex 6) is published annually and outlines details of yield and quality characteristics of all the varieties which have been in the National/Recommended List trials for at least

three years. While the extended trials have no statutory basis, it is from these more comprehensive trials that the DAF has earned wide respect in providing a service to Irish growers whereby they can be confident that the varieties recommended will perform well under Irish growing conditions of climate, disease pressure, etc. This is a very important reference source for the industry.

2.4.8 Outcomes

A summary of the outputs and outcomes from the potato variety evaluation Scheme is outlined in Table 42.

Table 42: Summary of outputs and outcomes of the potato variety evaluation scheme

SCHEME	OUTPUTS	OUTCOMES	TREND
(f) Potato Variety Evaluation Programme	Years 1992 – 2001 . Thirteen first early varieties trialled . Eleven second early varieties trialled . Fifty five main crop varieties trialled	. Improved varieties for yield, quality and persistence identified for earlier market . Reduction of harvest interval between first and main crop variety . Identification of varieties most suitable for evolving market uptake by growers of evaluation list varieties	The number of first earlies trialled has reduced by 30 % since 1992. The number of second earlies trialled has reduced by 40 % since 1992. The number of main crop trialled has increased by 70 % since 1992.

2.4.9 Resources

The Department staffing and operational resources employed in the delivery of the potato variety evaluation programme in 2002 are outlined in tables 43 and 44.

Table 43: Staff costs of potato variety trials

Location	No Staff/ Grade	Total costs of staff in Column 2	Staff Costs of this scheme	This scheme as % of total costs
Backweston **Other**	1 SI (3%) 1AI (75%) 1AAI (30%) 1 TAO (90%) 1 Ag. Labourer (25%)	€321,628	€130,038	40%
Total Inspectorate Staff		**€321,628**	**€130,038**	**40%**
Total administrative Staff	**1PO(2%),** **1AP(2%),** **1HEO(2%),** **1EO(5%),** **1CO(5%)**	**€308,761**	**8,100**	**3%**
Total staff Costs		**€630,389**	**138,138**	**22%**

Table 44: Operational Costs of Potato Variety trialling

Detail of potato expenditure on variety trialling	Costs
Contract with Grower (Includes preparation of seedbed, fertiliser, spray etc) Seed Machinery, transport, Fuel Potato Lab, Cold Store	 €5,000 €1,500 €4,800 €4,000
Total costs potatoes	**€15,300**

2.4.10 Evaluation of Potato Variety Trialling Programme

The Department's Potato Variety Evaluation Programme is important to the Irish potato sector. It has provided information to the industry on the most suitable varieties required by the market. The potato evaluation programme has resulted in the identification of varieties for commercial use whether in the crisping, chipping or ware production sectors. The uptake by growers of Evaluation List of Recommended Varieties is estimated at 80% based on figures in the Bord Glas Census for 2002.

Over the last ten years some 79 varieties have been evaluated. An examination of the uptake of these varieties for ware production over the period is presented in Table 45.

Table 45: Comparison of varieties trialled and ware production 1992-2002

Varieties	Years in DAF Trials 1992-2001	Total Ware Production 1992-2002		% of Total area
		No years sown	Area Grown	
'Established' varieties (Controls)				
Home Guard	10	11	15954	
British Queen	10	11	50506	
Record	8	11	67996	
Kerrs Pink	10	11	115427	
Golden Wonder	3		9256	
King Edward	1	2	312	
Sub –total (6)			**259451**	64%
Other Maincrop				
Rooster	7	8	56978	
Cara	8	9	8756	
Sub-total (2)			**65734**	16%
Processing Varieties				
Saturna	2	9	14037	
Maris Piper	5	8	12830	
Lady Claire	2	3	1252	
Lady Rosetta	2	3	9231	
Sub-total(4)			**37350**	9%
Other Varieties grown (18)	Variable	Variable	40436	10%
Varieties trialled but not grown for ware (49)	Variable		0	
Total			**402971**	**100%**

Source: DAF, An Bord Glas/DAF Surveys

The total number of varieties trialled between 1992 and 2002 was 79 of which 30 were grown commercially in Ireland.

Twelve of these varieties accounted for 90% of the ware area grown in the period with the other 18 accounting for 10% of the area sown.

Apart from the processing varieties, the only new maincrop variety which has come on stream in the period is Rooster, a Teagasc bred variety which was introduced in 1992. In 2002 it accounted for 31% of the Irish ware market. Cara, another Teagasc bred variety, is grown mainly for seed but is declining in importance.

The remaining 49 varieties trialled were not grown for ware in Ireland, although some Irish bred varieties were grown extensively in foreign markets. Much of the Teagasc breeding programme to date had been directed towards the low dry-matter export market with Cara being the main variety to achieve significant seed export quantities. This approach is now changing as evidenced by the emergence of the variety Setanta and the seedlings T1640a33 and T2637/12 which are suitable for the Irish market.

The main varieties grown in 2002 are listed in Table 46.

The Table shows that very few new maincrop varieties have come on stream, with ware production concentrated in four varieties - Rooster, Kerrs Pink, Record and British Queen - which apart from Rooster have been long established. Processing varieties accounted for an average of 9% of the total area sown between 1992 –2002 but in 2002 they accounted for 14% of the area planted. The growing of varieties for processing has become important in recent years and the trialling of these mirrors this development.

Table 46: Varieties Sown in 2002 (% of Total Area)

	Ware	Processing	Early
Rooster	31		
Kerrs Pink	25		
Record	6		
Golden Wonder	5		
Lady Claire		4	
Lady Rosetta		5	
Maris Piper		3	
Saturna		2	
British Queen			11
Other Earlies			4
Total	**67**	**14**	**15**

Source DAF, An Bord Glas Census 2002

Trialling of Teagasc Varieties

Over the past 10 years 17 Teagasc varieties have been trialled under the variety evaluation programme. As outlined in Table 47 only five of these varieties were grown under the seed certification scheme and for ware in 2002 with Rooster and Cara accounting for 99% of the area sown. As previously outlined (section 1.6) most of the Teagasc varieties are grown in Scotland.

Table 47: Teagasc Bred Varieties 2002

(Hectares)

Variety	Area Classified For Seed Production	Area Grown For Ware
Ambo	-	-
Anna	-	-
Avondale	-	-
Barna	-	-
Burren	-	-
Cara	61	95
Camelot	-	-
Christina	-	-
Colleen	2	13
Druid	2	2
Glenroe	-	-
Malin	-	-
Orla	2	2
Red Cara	-	-
Rooster	216	4,177
Shannon	-	-
Slaney	-	-
Total Teagasc Varieties	**283**	**4289**
Othe Varietiess	1,256	9,142
Totals	**1,539**	**13,431**

Source: DAF, An Bord Glas

National List Trialling in Ireland

As already outlined, the Department carries out its statutory obligations under *Council Directive 2002/53/EC of 13 June 2002* on the *Common Catalogue of Varieties of Agricultural Plant Species* by having **National List** (combined with Recommended List) trials. Varieties accepted into the National Catalogue must be based on the results of these official trials.

The National List trials can be carried out by:

(a) State authorities
(b) any legal person whether governed by public or private law, acting under the responsibility of the state, or
(c) in the case of ancillary activities which are also under state control, by any natural person duly sworn for that purpose

- provided that the persons mentioned under (b) and (c) derive no private gain from such measures.

National List Trialling in the UK

In the UK, National List trialling is the responsibility of DEFRA and is carried out by NIAB (National Institute of Agricultural Botany) and SAC (Scottish Agricultural College) on its behalf. Breeders who wish to submit a variety for National List trials pay a fee in the region of £1000 per variety.

There is no National List trialling carried out in Northern Ireland. The Department of Agriculture and Rural Development (DARD NI) carry out two Recommended trials each year (2nd earlies and maincrop) and may carry out an additional trial on 1st earlies in some years. These trials are funded by the DARD NI.

There is no Government support for Recommended List trialling of potatoes in the UK. The Recommended List programme is carried out by NIAB and SAC and funded by the British Potato Council growers levy.

Options for National List Trialling in Ireland

It is possible to market a potato variety in Ireland, not listed in the Irish National Catalogue, provided it is listed in the EU Common Catalogue. As outlined in Table 35, there were 16 varieties evaluated in 2002, 8 Teagasc bred varieties and 8 foreign bred. Of these varieties, 10 were on the EU Common Catalogue – 8 foreign and 2 Teagasc. Under Directive 2002/53/EC, trialling of the varieties already entered in the Common Catalogue is not a statutory requirement if the Irish authorities are satisfied that the conditions under which they were evaluated for cultivation and use were similar to Irish conditions. There is no guarantee, however, that the variety will perform well under Irish environmental and climatic conditions and considerable variation has been shown in the performance of varieties in Ireland compared to other member states, including the UK.

While it is not a pre-requisite for Irish-bred varieties to be listed in the Irish National Catalogue prior to being included in the National List trials of other member states, it does facilitate better access to these trials. In this regard, the Teagasc potato breeding programme would be seriously disadvantaged by the termination of National List trialling in Ireland.

The main reason why varieties are trialled here is to establish their suitability under Irish conditions and to identify superior traits which would be to the economic benefit of Irish producers and industry and provide consumers with the range of choice they require.

Ideally varieties would also be identified which would be suitable for the export trade, with seed produced in Ireland and exported to foreign markets. However, given the present decline in the home-based seed production industry, the identification of suitable varieties for the export only market has to be examined in the context of the current situation where the Irish seed production trade has suffered a serious decline.

Option 1: Department continues with trialling on a cost recovery basis

All potato trialling in Ireland is carried out free of charge. There is a charge for such services in most EU countries. Charging Breeders to have a variety trialled (say €1,000 per variety) would, in the context of the trial plans for 2004, bring in very little income and would most likely fall as a cost to be borne mainly by Teagasc. The implementation of a full cost recovery by the Department could effectively end the National List trialling programme.

The potato variety trialling programme represents only a small proportion of the total variety trialling costs carried out by the Department. As shown in Table 36 only 40% of the time of the five professional/technical involved is devoted to potatoes. The remainder of their time is spent on other plant variety evaluation activities within the Variety Testing Division which has an overall staffing level of 29 (see Table 21). Accordingly, any savings to be effected by having the potato trialling programme carried out elsewhere has to be considered in this context. In addition, there would be no reduction in the capital charges for the Backweston Centre by the discontinuation of the trials by the Department.

Option 2 – Teagasc to carry out trials

The Variety evaluation programme could be integrated with the Teagasc research programme. However, it is not clear, even with strict supervision by the Department, if there would be a conflict of interest as most of the varieties being tested are bred by Teagasc themselves. This could be in conflict with the EU legislation governing variety trialling.

If Teagasc carried out the the trialling, such work would be on the basis of full cost recovery from either the breeder or agent. In the case of Teagasc's own-bred varieties, for which IPM has exclusive rights, recoupment of these costs could be built into the contract arrangements which they have in place.

Option 3 – Private sector to carry out trials
There is already a precedent for private sector involvement in variety evaluation as in the case of sugar beet. Sugar beet variety trials are conducted by the Irish Sugar Company with financial contributions from the industry, including the Department. The Department has responsibility for ensuring that the trials are carried out to the required standards. However, a potential conflict of interest could also arise in this area due to the special arrangement between Irish Sugar and the breeders Syngenta. Assuming an independent private concern was interested in carrying out the trialling of potato varieties, the cost recovery by the private sector would give rise to the same difficulties as outlined in Option 2.

Co-operation with Northern Ireland
As most of the potatoes produced in the island of Ireland are grown in the north east of the country, there is scope for close co-operation in assessing the most suitable varieties for the whole country. Such co-operation could be examined under the framework of the North-South Ministerial Council established under the Good Friday Agreement or other mechanisms.

Co-operation with the Scottish authorities in evaluating new varieties should also be explored.

2.4.11 Potato Variety Trialling in 2004

In view of the limited uptake in the market place of new varieties and in view of the present decline of the seed production industry in Ireland, it has been decided by the Crop Variety Testing Division, in consultation with the Potato Advisory Committee, to rationalise the variety testing programme for potatoes in 2004. The number of varieties tested will be limited to those where a VCU is required for entry on to the National and Common Catalogues, or where there is strong commercial interest in a particular variety. The number of sites is being reduced from five to three and will be located, as far as possible, on Department owned sites in the main potato growing areas in the country.

2.4.12 Options and Outcomes

A summary of possible options and outcomes from alternative means of carrying out the variety evaluation programmes is outlined in Table 48.

Table 48: Summary of Options and outcomes

Option	Outcome	Financial Implications
1.Department continues with scheme on a (partial) cost recovery basis	Would ensure strong commercial influence on the evaluation programme, value for money, varieties to be trialled , no of trials etc.	Savings to DAF of up €75,000 in staff and operational costs. (Capital costs associated with Backweston would continue to be provided free)
2.Teagasc to carry out scheme under DAF supervision on cost recovery basis	Would fully integrate Teagasc breeding and variety evaluation programmes in Oakpark. Teagasc in position to seek full cost recovery for its own varieties through IPM contract arrangements. For other varieties cost recovery through charges on breeders, agents and growers. Teagasc already carry out quality analysis of varieties under trial for the Department on a fee basis. Department would be responsinble for overseeing the trials.	Savings to DAF of up to €150,000 on staff and resources. Department capital resources freed up for other uses. Some senior DAF staff required to oversee programme
3.Private Sector to carry out scheme under DAF supervision on cost recovery basis.	Would ensure strong commercial influence on varieties selected for trialling. Scale of charges to effect full cost recovery could be prohibitive.	As in 2

2.5 Seed Production and Certification Services

The availability of seed potatoes of the highest quality is essential for the national potato crop from both a plant health and economic perspective. Control of potato seed quality is more difficult than with conventional seeds such as cereals because the potato is a vegetatively propagated crop and, accordingly, is more prone to accumulating pests and diseases leading to seed degeneration. This degeneration is unavoidable but the speed which it occurs depends on the environment and the expertise of the grower. A seed replacement or multiplication scheme is needed to replace this degenerated seed.

The seed certification services of the Department are aimed at providing high quality seed for the domestic ware crop and for export markets. The process involves the multiplication of disease free potato stocks from nucleus units through micropropagation in the laboratory and subsequent multiplication in the glasshouse and field. Officers of the Seed Certification Division are involved at every stage of the process to ensure that only seed of the highest standard is produced and marketed. These activities and other related activities which are undertaken by the Division are outlined in sections 2.5.1 and 2.5.2.

2.5.1 Tops Centre –Production of Pre-basic seed

2.5.1.1 Objectives

The main objective of Tops is to produce early generation (pre-basic) disease free potatoes for propagation under the seed certification scheme The centre which was established in 1972 comprises an 80 Hectare farm with laboratories and glasshouses.
Prior to 1972 DAF produced pre-basic seed on rented land, but due to difficulties in acquiring suitable land it was decided to purchase and establish the Tops Centre.

The process at Tops involves the selection of superior clones and their regeneration through meristem tip cuttings (sprouts) to produce microplants. These microplants are planted in the glasshouse to produce minitubers which in turn are planted out on the Tops farm to produce the first generation Pre-basic 1 seed. This seed is propagated further the following year to produce Pre-basic 2 seed. Pre-basic 2 seed is sold to growers for further propagation under the seed certification scheme. .

A second objective is to characterise new varieties of potatoes as laid down by the International Union for the Protection of New Varieties of Plants (UPOV). All newly bred potato varieties must undergo a minimum two year test to ensure that it is distinct from any other potato variety in common knowledge, that it is sufficiently uniform in its relevant characteristics and that it is stable i.e. it must remain true to its description after repeated reproduction or propagation. An average of six varieties are DUS tested annually at Tops.

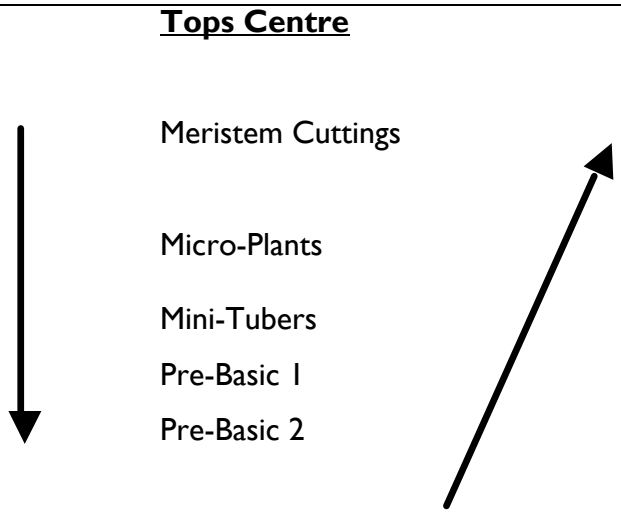
A further objective of Tops is to maintain a national collection of potato varieties to ensure the survival and appropriate use of plant genetic resources. This will become a statutory duty of the Department as signatory to the International Treaty for Plant Genetic Resources for Food and Agriculture. The national collection is maintained both in vitro and in field plots. There are about 400 varieties maintained with some dating back to pre famine times.

The Tops Centre also provides a diagnostic service for common potato diseases and a chemical residue testing facility for the Seed Certification Scheme. During 2002, a total of 4,776 potato leaf samples were tested for the presence of potato viruses and 43 samples were examined for fungicide residues to ensure compliance under the Certification Scheme.

Since 2002 Inspectorate staff at the Tops Centre are also responsible for the management and supervision of the Foundation Seed Certification Class.

The seed source, generational system and classification system are outlined in the diagram (Diagram 3) below.

Diagram 3 The Generational Control in Certified Seed Potato Production in Ireland



The actions involved in achieving the objectives for the Tops centre can be summarised as follows:

2.5.1.2 Pre-Basic seed production.

- Select superior clones of each variety for nucleus plots
- Maintain nucleus stocks of healthy and genetically pure samples of the different seed varieties in vivo.
- Regenerate these varieties through the meristem tip culture technique
- Rapidly multiply same through nodal cuttings
- Plant and grow microplants in glasshouses and harvest minitubers
- Virus test in vitro and in vivo stocks.
- Produce two field generations of seed tubers
- Carry out weekly growing crop inspections for varietal purity, off-types and disease
- Store and grade an average of 81 tonnes per year of Field Generation 2 seed (Pre-Basic 2).
- Sell on average 50 tonnes per year of Generation 2 seed to Foundation growers.

Distinctness, Uniformity and Stability Trials.

- Grow and maintain a reference collection of varieties with which varieties under test are compared.
- Compare test and reference varieties and record observations
- Complete interim and final DUS reports.

National Potato Variety Collection

- Propagate harvest and store 400 distinct varieties separately.
- Renew collection of approximately five varieties through meristem tip culture and chemotherapy, annually

2.5.1.3 Inputs/Outputs

Farm and Laboratory

The Centre comprises a farm of 80 hectares, laboratory and ancillary equipment, glasshouses and potato storage facilities. In addition a further 4 hectares (approx) of land is rented in specific Donegal locations to grow the Nucleus Unit plots, National Potato Variety Collection, DUS Trial and Wart Disease Assessment plots.

The Nucleus Unit Plots contain approximately 340 varieties and is the source of virus free tubers required for the meristem and micropropagation programme. Accordingly, these plots are grown in isolation from other potato crops in remote locations and at high altitudes. The other programmes (above) requiring rented land and for health reasons, must be grown away from the Pre-Basic seed crops.

Approximately 4 hectares (of which about 20% is un-cropped- spacing, headland) of Pre-Basic seeds are grown at Tops annually to provide for the Departments Certification Scheme.

Pre-basic seed output

The total quantity of Pre-Basic1 seed produced in Tops over the period was 102 tonnes or 9.2 tonnes per year. This was propagated at Tops to produce 889 tonnes of Pre-Basic 2 or an average of 81 tonnes per year. Because of the high standards required for seed entering the certification system, tubers with diseases, disorders and off-type variants, are rejected and those outside the EU seed size guidelines are also graded out. Accordingly, of the 889 tonnes of Pre-Basic 2 produced some 553 tonnes or an average of 50 tonnes per year were sold to Foundation seed growers for further propagation representing an average rejection rate of 38% of Pre-basic 2 seed. In 2002 61 tonnes of Pre-Basic 2 seed was sold to Foundation seed growers at €635 per tonne. A detailed breakdown of the stocks produced and sold over the period of the review is presented in Table 49.

Table 49: Production in Tops 1992-2002

Crop Year	Nucleus Units Varieties	No. of Microplants	No. of Minitubers	Pre-Basic 1 Tonnes	Pre-Basic 2 Tonnes Produced	Pre- Basic 2 Tonnes sold
1992	135	9508	18,000	10	81	47
1993	135	7872	15,745	9	75	65
1994	135	9590	38,445	15	103	44
1995	138	7043	15,000	12	98	47
1996	135	5992	13,150	7	108	52
1997	129	7075	12,850	8	87	60
1998	133	8412	8500	6	64	46
1999	133	9845	17,534	8	65	47
2000	138	10665	21,225	8	80	57
2001	150	11870	18,645	9	50	27
2002	171	17413	35690	10	78	61

The degree to which pre-basic seed was propagated in the period 1992-2002 is outlined in Table 50.

Table 50: Relationship between Pre-basic seed production and certified seed areas

Year	PB2 sold from Tops (tonnes)	FSI Area* Ha	FS2 Area Ha	SEI Area Ha	SE2 Area Ha	SE3 Area Ha	Elite Ha	Class H Ha	Total Area Ha
1992	31	12 (31)	47	179	**	**	2328		2852
1993	47	19 (47)	54	131	**	**	2366		2551
1994	65	30 (84)	120	435	**	**	1438		2846
1995	44	71 (193)	107	379	317	38	1705	481	3099
1996	47	72 (194)	51	326	183	174	1410	785	3002
1997	52	67 (181)	66	279	149	103	1261	153	2078
1998	60	71 (192)	118	346	270	169	1157	87	2218
1999	46	37 (99)	136	383	300	271	906	109	2143
2000	47	14 (47)	87	317	262	373	673	27	1753
2001	57	14 (57)	26	211	277	370	502	135	1535
2002	27	8 (27)	61	157	369	342	580	21	1539
2003	61	19 (61)	45	319	395	468	469	10	1725

**figures in brackets are tonnes of Pre-basic2 seed sown in this area. Figures from 1994-1999 are based on seeding rate of 2.7 tonnes per hectare*

***There is no breakdown of areas for SEI, SE2 and SE3 and, accordingly, the total area for Super Elite is given under SE1.*

The above data shows that Tops pre-basic seed supplies met the requirements of FSI growers in 1992-1993 and 2000-2002. In the period 1994-1999 pre-basic seed produced by private operators under the An Bord Glas (ABG) minituber scheme supplied 65% of the seed planted. Record and Kerrs Pink accounted for most of these non-Tops supplies as outlined in Table 51.

Table 51: Pre-basic seed requirements and supplies from Tops

Year	Kerr's Pink				Records			
	Sold from Tops Tonnes	FSI area sown Hectares	Pre-basic seed required Tonnes	Shortfall Tonnes	Sold from Tops Tonnes	FSI area sown Hectares	Pre-basic seed required Tonnes	Shortfall Tonnes
1995	14.2	9.02	27	**13**	13	31.4	96	**83**
1996	2.8	13.09	40	**37**	6.3	27.2	83	**77**
1997	12.5	18.7	57	**44**	-	5.3	16	**16**
1998	12.1	29	87	**75**	6.0	9.8	30	**14**
1999	4.85	11.7	36	**31**	3.0	2.3	7	**4**
2000	8.3	4.2	13	**5**	3.8	1.2	4	**-**
2001	7.5	3.62	11	**3**	4.9	2.2	7	**3**
2002	2.2	0.5	2	**-**	3.8	2.1	6	**2**

The main reason for the introduction of the ABG minituber scheme was the breakdown of some varieties to viral disease. Virus Y^n was endemic at farm level in the late 80's and early 90's with the variety Record particularly susceptible. The problem was accentuated in Donegal where there was large scale growing of Record ware crops from uncertified seed to supply the new chip factory in Letterkenny. These crops created a resorvoir of the virus which began to infect the early generation certified seed grown in the area. The Pre-Basic 2 Record at Tops became infected in 1996.

Supplies from Irish companies

As outlined above a significant area of Pre-Basic Kerr's Pink and Record plantings between 1995 and 1998 were derived from the ABG minituber scheme. While there was some slight shortages of Kerrs Pink seed supplies to meet the needs of the Certification scheme due to the emphasis placed by Tops on the production of Record, most of Pre-Basic seed produced by the 14 growers under the ABG scheme went directly into the Certification scheme to provide early generation seed for the lucrative washed ware trade market. Most of the requirements of the core Foundation Seed growers were met by Tops supplies which went through the normal multiplication process.

The An Bord Glas minituber programme was introduced in 1992 when 22,000 minitubers of the variety Record were planted. The progeny of the 1992 and 1993 plantings were sold to seed potato growers to interest them in producing seed from minitubers. Due to the cost involved in purchasing minitubers and multiplying them 3-4 times, the scheme was subsidised by Bord Glas. The number of minitubers sold to growers increased to 420,000 by 1996 at which stage Bord Glas agreed that the original aim of the scheme had been achieved and it was therefore considered the current commitments to subsidising the cost of minituber production should be terminated. The phasing out of Bord Glas support would happen over a three year period 1997-1999. In 1996 the cost of a minituber was approximately 25p and Bord Glas provided a 50% subsidy. The subsidy for the period 1997-1999 was set as follows:

Pre 1997	50%
1997/1998	40%
1998/1999	30%
1999/2000	20%

The operation of the scheme over the period 1992-1999 involved an expenditure of £212,000 in the subsidisation of 1.68 million minitubers. These minitubers were propagated to produce 629 tonnes of Pre Basic seed which represented a state subsidy of £337 (€428) per tonne. An breakdown of the minituber production and the Bord Glas subsidy is outlined in Table 52.

Table 52: Bord Glas minituber production and expenditure

	1992	1993	1994	1995	1996	1997	1998	1999
No of minitubers '000	22	200	200	338	420	230	129	144
Bord Glas Expenditure £'000	32	46	49	38	24	16	2	5

Source: An Bord Glas

Two minituber propagation companies – Dubcap and Green Crop Ltd based in Co Carlow – produced the minitubers in glass houses and these were sold to 14 growers throughout the country (Table 53).

Table 53: Pre-basic seed producers under An Bord Glas Minituber Scheme

County	No of growers
Donegal	5
Mayo	2
Dublin	2
Wexford	2
Cork	1
Tipperary	1
(Carlow)	1

Source: An Bord Glas

The number of minitubers broken down by variety which were subsidised by An Bord Glas over the period of the scheme is outlined in Table 54.

Table 54: Bord Glas Minituber Production Scheme – varieties produced

Variety	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
Record	22,000	100,000	60,000	39,062	112,500	50,000		
G. Wonder		100,000	40,000	35,640	34,000	25,000		
Saturna			100,000		31,000	25,000	15,000	
B. Queen				61,187	29,000	30,000		
K. Pink				91,670	38,500	50,000	11,000	
Home Guard				19,980	19,500	19,000		
Pentland Dell				35,000	35,000	30,000	5,000	
Spunta				19,894	30,000		38,000	
Crispin				1,244	10,000			
Maris Piper				4,500	-	25,000	5,000	
Symphonia				2,347	-			
Brodick				1,943	-			
Van Gogh				5,394	-			
Gold Star				9,954	-			
Avalanche				10,352	-			
OP 10					50,000			
Rathlin					10,000			
Arkula					3,000			
Lady Rosetta					3,000	18,000		
Desiree					10,000			
Red Pontice					6,000			
Orla							8,000	
Druid							4,000	
Malin							2,000	
Bintje							5,000	
King Ed							5,000	
Nicola							5,000	
Rekea							3,000	
Sera Fina							3,000	
Jacquline							3,000	
Almare							1,000	
Total	**22,000**	**200,000**	**200,000**	**338,167**	**421,500**	**254,000**	**131,000**	
Actual Output	22,000	200,000	200,000	338,000	420,000	230,000	129,000	144,000

Source: An Bord Glas

Tracking of Pre–basic seed propagation

Pre-basic seed from Tops is the primary source of most of the ware crop sown in Ireland. The data in Table 55 tracks the progress of the 2000 pre-basic seed crop through to Foundation seed growers who purchased this seed in 2001. More detailed information is provided in Annex 7, Annex 8 and Annex 9.

Table 55: Tracking Pre basic seed propagation 1999- 2003

Year	Pre-basic 1 Produced at Tops	Pre-basic 2 produced at Tops	Pre-basic 2 sold from Tops	Pre-basic 2 eligible for FS certification	FS 1 Produced	FS 1 planted	FS 2 Seed produced	FS 2 seed sown
	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes
1999	8							
2000		80						
2001			57	43	292 as dug of which 79(sealed)			
2002						180	1217 (351 tonnes sealed, 866 tonnes unsealed	
2003								1046

Pre basic 1

Eight tonnes of Pre-basic 1 seed propagated in Tops in 1999 yielded 80 tonnes of Pre-basic 2 seed in 2000. Some 23 tonnes of this Pre-basic 2 seed did not meet the required standards and was rejected leaving 57 tonnes available for sale to Foundation seed growers in 2001.

Pre-basic 2

Of the 57 tonnes of pre-basic 2 seed available for sale in 2001, 56.77 tonnes were sold to 19 Foundation Stock growers. An area of 4.04 hectares on which 9.01 tonnes of pre-basic 2 seed was planted was downgraded as it failed to meet the requirements of FS seed production. A further 4.45 tonnes of pre-basic 2 seed did not enter the certification system (sold for ware, discontinued etc). One grower was responsible for 1.35 tonnes of this seed. Accordingly, 43.36 tonnes grown on 14.02hectares met the requirements for FS seed.

FSI

The total quantity of FS1 seed certified in 2001 from the 43.36 tonnes of pre-basic seed sown in 2001 was 292 tonnes of which 78.58 tonnes were sealed.

FS2

The total area planted in 2002 with FSI seed to grow the FS2 crop was 60.61 hectares. The estimated FSI seed requirements for this area is 180 tonnes. In general the FS1 grower

retains his own seed for the production of FS2 while the sealed seed is marketed. As outlined in Table 55 there was 292 tonnes of FS1 seed certified as dug of which 78.58 tonnes sealed.

The total production of FS2 seed produced in 2002 was 1217 tonnes (351 sealed and 866 tonnes unsealed). A further 325.5 tonnes of the production was downgraded to lower class seed and sealed.

FSII Sealed	351.0
FSII unsealed	866.0
Other classes (SEI&E)	325.5
Total	**1542.5**

Of the above, 38 tonnes of unsealed FSII *King Edward* was discarded and 89 tonnes of Elite *Cara and Druid (* IPM/Teagasc varieties) were exported.
The quantity of FS2 seed available for planting in 2003 was accordingly 1179 tonnes.

SE1 (Super Elite)
The total area planted in 2003 with FS2 seed to grow the SEI class was 353.49 hectares. The estimated FSII seed requirements for this was 1046 tonnes. Accordingly, from these figures, there was a surplus of about 133 tonnes of FSE 2 stock.

The foregoing shows that there is leakage in the multiplication chain and as shown in Table 56 actual production of FS1 and FS2 represents less than a third of the potential output from the multiplication process.

With *free* varieties leakage occurs due to growers selling both seed and ware from the inspected crop in order to maximise their returns as often the price of ware potatoes may equal or exceed seed prices. Leakage can also occur where ware growers purchase high-grade seed (FS 1 + FS 2) and which is subsequently entered for the Class X system.

Table 56: Actual and potential output of early generation seed

	PB1 (1999)	PB2 (2000)	FS1 (2001)	FS2 (2002)
Actual tonnage required for planting the following generation	8	57	292	1538
Potential tonnage which could be available for planting the following generation	8	57	570	5,700

The changes at retail level over the last number of years to washed potatoes and the consequent requirement for minimum skin blemishes has pushed up demand by ware growers for earlier generation seed than heretofore. Ware potatoes suitable for the 'wash trade' achieve significant premia over ordinary potatoes so growers striving to meet this standard are demanding earlier generation seed. Demand therefore for Tops seed remains strong but because of a limit on glasshouse capacity production of pre-basic seed has been limited to 80 tonnes per year with some 50 tonnes available for the market.

Some stock may also be given over to alternative uses as there is a very limited influence of the market on what varieties and volumes of pre-basic stock should be produced, with Tops management, in effect, having to guess market requirements in advance. Since 2000, and following on the recommendations on the Expert Group report on the Seed Potato Industry, Tops are producing to order on application from Foundation Stock growers for the free varieties. Production of the protected varieties is based on orders from the Rights holders. There are, however, no contractual arrangements in place between Tops and the buyers of the seed.

Microplants

In addition to producing microplants for the eventual supply of pre basic seed for the Certification Scheme two commercial companies i.e. Agricrop, and Green Crop, source microplants from the Tops Centre. These companies normally export these either as microplants or minitubers. Tops also supplied microplants for the private minituber scheme subsidised by An Bord Glas which ended in 1999.

Microplants are charged at € 0.75 per plant.
The number of microplants supplied to private operators in the period is given in Table 57. These microplants are part of the total numbers shown in Table 49.

Table 57: Microplants supplied to Commercial Companies 1992-2002

Year	No. Microplants
1992	665
1993	336
1994	67
1995	191
1996	426
1997	249
1998	70
1999	233
2000	314
2001	60
2002	170

Source: DAF

Virus and Residue Testing

The number of samples tested for viruses and residues for the period under review are given in Table 58

Table 58: No. samples tested for viruses and Fungicide Residues 1992-2002

Year	No. Samples tested for Viruses	No. Samples tested for Residues
1992	N/A	N/A
1993	4969	N/A
1994	N/A	51
1995	4273	91
1996	4853	49

1997	3996	40
1998	4331	42
1999	4217	43
2000	3536	43
2001	4456	9
2002	4776	43

Source: DAF

Other activities carried out at Tops relate to DUS testing of new varieties and the maintenance of the National Collection of potato varieties. The outputs from these activities and the other activities outline above are summarised in Table 59.

Table 59: Summary of Inputs, Outputs and Outcomes for main Activities at Tops

		Outcomes	
Inputs	**Outputs (2002)**	Immediate	Long-term
Clonal Selections	Clonal determinations	Suitable clones for further propagation	Production level of varieties maintained
Maintenance in vivo of nucleus plots	188 virus free nucleus plots (field plots)	Virus free varieties for seed propagation	Availability of seed for seed for present & future use
Maintenance in vitro of varieties in laboratory	Disease free microplants from 186 varieties.	186 varieties ready for immediate micropropagation	Varieties conserved for present & future use
Maintenance of a national/ museum collection of varieties	400 varieties maintained	Varieties available for breeding & commercial use	Survival of plant genetic resources
Conduct trials for wart disease	Annual list of varieties immune to wart disease forwarded to E.U.	Compliance with Wart Disease Order (Black Scab Order)	Avoidance of growing susceptible varieties in wart scheduled land
DUS Tests on new varieties	2 varieties described	Recognition and naming of new varieties	New varieties available and allowed to be marketed
Production of pre- basic seed	Annual production of 78 tonnes of pre-basic seed	Average of 50 tonnes of seed supplied to growers in DAF's Certification Scheme	Seed source for 82% of national production
Laboratory / Diagnostic services	4,776 and 43 samples tested for virus & residues respectively	Confirmation of adherences to certification standards	Certified seed produced as prescribed under scheme
Management & supervision of Foundation Certification Scheme	69 hectares certified	High grade seed available for further multiplication	Seed source for 82% of national production

2.5.1.4 Resources

Table 60: Staff Numbers at Tops

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
A.I.	2	2	2	2	2	2	2	2	2	2	1
AAI	1	1	1	-	-	-	-	-	1	1	1
D.S.	1	1	1	1	2	2	2	2	2	2	2
Lab. Staff	1	1	2	2	2	2	2	2	2	2	2
TAO	3	2	2	2	1	1	1	1	1	1	1
C.O.	-	-	-	-	-	1	1	1	1	1	1
Industrial. Grade	4	4	4	4	4	4	4	4	4.5 *	4.5*	4.5*

* Industrial grade shared with Crop Variety Testing – Grasses

Traditionally, the production and inspection of pre-basic seed was deemed the duty of experienced senior officers. This is the rational for having two District Superintendent grades and only one TAO grade.

Costs

A breakdown of the staffing costs and operational costs for 2002 is given in Table 61 and 62.

Table 61: Staff Costs at Tops 2002

Location	No. of Staff & Grades (staff time: 100% spent on Potato duties)	Costs €
Inspectorate	1 AI 1AAI	122,574
Technical	2 DS, 1 TAO, 1 SSA 1SA	271,147
Administrative/Industrial (Tops)	1 CO, 4 Industrial Grades	141,674
Administrative (Maynooth)	1PO, 1AP, 1 HEO, 1 EO, 1 CO	40,686
	Total Staff Costs:	**576,081**

Table 62: Operational (non-staff) Costs of Tops Centre

Category	Costs/receipts
Operational Costs:	225,711
Receipts	150,708
Net Costs	**75,003**

Total Costs: staff and other €651,084

2.5.1.5 Evaluation

Examination of the outputs from Tops in the context of the changes in the sector between 1992-2002 and consideration of alternative means of achieving the objectives or ceasing the activities

The main outputs from Tops can be summarised as follows:

- Production of pre-basic seed for further multiplication on farms under the seed certification scheme
- Provision of microplants to commercial companies
- Maintenance of a national collection of varieties
- Conduct of trials on new varieties for distinctiveness, uniformity and stability (DUS)
- Diagnostic service for potato diseases and pesticide residues

1. Production of Pre-basic seed

Cost of producing pre-basic seed

The cost of running the Tops centre in 2002 was €651,084. As outlined in Table 59 there are nine outputs from the activities at the centre with the main output being the production of pre-basic seed for further multiplication within the seed certification service. The average output of pre-basic seed over the period of the review was 60 tonnes i.e. 10 tonnes of 1st generation and 50 tonnes of 2nd generation. If the total costs of Tops are attributed to this output then the average cost of producing a tonne of pre-basic seed is €10,850. The income derived from the sale of pre-basic 2nd generation seed in 2002 was €635 per tonne.

If the staff/operational costs at Tops associated with the production of basic seed is put at 50%, this translates into a cost of €5425[9] per tonne of pre-basic seed. However, the real costs per tonne are much higher than this when account is taken of the quantity of pre-basic seed which fails to be propagated any further or is exported at an early generation stage.

[9] This cost is mainly related to staff costs and excludes the Capital Costs associated with the farm, glasshouses and other ancillary facilities.

However, if account is taken of pre-basic seed sales from Tops in 2002 which amounted to 27 tonnes, then the cost per tonne was of the order of €12,057 per tonne assuming that 50% of the costs are in the production of pre-basic seed.

Varieties

While the number of varieties has declined from 45 to 26 over the decade there is still no clear relationship between the number of varieties and the quantity of pre–basic seed produced and the requirements of the ware market. As already outlined in Chapter 1 there is now a concentration on a small number of varieties for the ware market with major inroads by protected varieties. The following Table (Table 63), which gives a breakdown of pre-basic seed disposals for 2001 and comparisons with certified seed and ware areas grown in 2002, illustrates this situation.

Table 63: Pre-basic seed disposals from Tops and Certified Seed and Ware areas sown

Variety	**Pre-basic seed sold from Tops in 2001** **Tonnes**	**Seed area and quantity certified in 2002** **Hectares Tonnes**	**Ware area planted in 2002**
Rooster(IPM Variety)	4.2	216 (3397)	4177
Kerrs Pink	7.5	724 (2767)	3371
British Queen	8.2	101 (945)	1470
Record	4.9	171 (858)	854
Lady Rosetta	0.2	45 (510)	655
Golden Wonder	4.05	118 (642)	613
Maris Piper	3.35	46 (133)	451
Saturna	2.30	23 (409)	394
Home Guard	4.5	19 (131)	268
Cara (IPM Variety)	1.54	61 (429)	95
SubTotal	**40.74**	**1524 (9921)**	**12348**
Other Varieties*	16.08	16 (437)	30
Total	56.82	1539 (10538)	12378**
Sub Total as % of Total	**69%**	**99% (94%)**	**100%**

* see Table below

** This figure is the total ware grown in Ireland from the varieties listed some of which originated from imported seed. An additional 1053 Hectares of ware are grown from solely imported varieties giving a total ware area of 13431 hectares.

Other IPM Varieties			
Shannon	0.1	0 -	0
Druid	1.35	2.1 (44)	2
Malin	1.28	0 -	0
Avondale	1.20	0 -	0
Colleen	1.15	1.9 (39)	13
Orla	2.18	2.01 (13)	0
Sub Total (A)	**7.26**	**6.01 (96)**	**15**
Other Varieties			
King Edward	1.81	1.8 (0)	5
Pimpernel	1.10	0 (6)	3
Duke of York	0.85	1.15 (11)	2
Pentland Dell	1.95	0 -	0
Pentland Ivory	0.95	1.0 (1)	1
Desiree	0.60	0 (48)	0
Estima	0.75	0 -	0
Aran Victory	0.25	0.4 -	1
Champion	0.13	0.2 -	0.5
Dunbar Rover	0.43	0.8 (13)	1
Sub Total (B)	**8.82**	**10 (79)**	**15**
Overall Total (A+B)	**16.08**	**16 (175)**	**30**

Source: DAF, An Bord Glas/DAF Census

The four varieties Rooster, Kerrs Pink, British Queen and Record, comprise 75% of the quantity of certified seed produced and 80% of the ware market area but pre-basic seed of these varieties in 2001 represented only 44% of Tops output of 24.8 tonnes. Of the other six varieties of potatoes – Lady Rosetta, Golden Wonder, Maris Piper, Saturna, Home

Guard, Cara- which make up the remaining 20% of the national ware area, there was 15.9 tonnes or 28% of the total produced in Tops. However, there are 16 other varieties which account for 16.08 tonnes or 28% of Tops output but only 16 hectares was propagated for seed and 30 hectares for ware in 2002. Indeed, there are seven of these varieties which are not propagated at all and one variety, King Edward, which was classified for planting under the seed certification scheme but went for ware production.

There is a major variation between the propagating efficiency of protected varieties and free varieties for seed and ware production as can be seen from Table 64.

Table 64: Comparison of seed/ware outputs between 'controlled' varieties and 'free' varieties

	IPM varieties		Other Varieties	
	Total	Output per tonne	Total	Output per tonne
Pre-basic seed (tonnes)	13	-	44	-
Certified Seed (tonnes)	3922	301	6712	152
Ware area (Ha)	4287	330	8091	183

While this measure of productivity of pre-basic material may be somewhat crude in that it does not take into account imported certified seed used, it nevertheless provides a general picture: the ouput from IPM 'protected' varieties is twice that of the 'free' varieties in the case of certified seed and the ware area sown. If the exercise is done for the mainstream varieties (in Table 65 below) the productivity of the IPM varieties in regard to certified seed output is almost quadrupled. It is clear therefore that pre-basic seed of the 'protected' varieties is more efficiently propagated than pre-basic seed from the 'free' varieties.

Table 65: Comparisons of productivity of pre-basic seed between main 'controlled' and 'free' varieties

	IPM Varieties (Rooster and Cara)		Main other (seven) varieties	
	Total	Output per tonne	Total	Output per tonne
Pre-basic seed (tonnes)	5.74	-	35	-
Certified seed (tonnes)	3826	666	6095	174
Ware area (Ha)	4272	744	8076	231

Meeting Pre-basic seed requirements

For 6 years of the 11 years under review pre-basic seed from sources other than Tops provided most of the requirements for the FSI certified seed area. As already outlined in Table 49, Tops supplied 523 tonnes of the 1152 tonnes of pre-basic seed sown in the period 1992-2002. The remaining 629 tonnes of pre-basic 2 seed was produced under the Bord Glas minituber scheme.

Under this scheme operated between 1992 and 1999 a total of 1.68 million minitubers were produced by two private companies from microplants supplied by Tops. These minitubers were sold to 14 select growers who propagated them to produce 629 tonnes of pre-basic seed for entry to Foundation and other classes. In the same period Tops produced 139,224 minitubers and 392 tonnes of Pre-Basic seed. To get this scheme off the ground Bord Glas gave a subsidy to growers the cost of which amounted to £212,000 and varied from £1.45 per minituber in 1992 to £0.05 when the scheme ended in 1999. In terms of the quantity of pre-basic seed produced the subsidy represented approximately £337 per tonne over the period of the scheme. As already outlined pre-basic seed produced from these minitubers considerably exceeded that from Tops during the 90s. A comparison between minituber production from Tops and from private companies over the period in which the Bord Glas subsidy was provided is outlined in Table 66.

Table 66: Minitubers produced in Tops and private companies 1992-1999

	1992	1993	1994	1995	1996	1997	1998	1999	Total
No Minitubers produced in Tops	18,000	15,745	38,445	15,000	13,150	12,850	8,500	17,534	139,224
No minitubers produced by private operators	22,000	200,000	200,000	338,000	420,000	230,000	129,000	144,000	1,683,000
Bord Glas subsidy to private operators	£32,000	£46,000	£49,000	£38,000	£24,000	£16,000	£2,000	£5,000	212,000

Source: DAF, An Bord Glas

When the Bord Glas subsidy was withdrawn in 1999, production of minitbers and pre-basic seed under the Bord Glas Scheme ceased. The CEAS report[12] referred to the difficulties for private operators competing in a market which was being substantially subsidised by the State.

There is now one operation producing minitubers on a semi commercial basis in Ireland. Last year this company purchased 170 microplants from Tops or 1% of the 17,413 produced at the station. The income from these sales was €127.50. Most of this production is in the form of glasshouse generation minitubers. It is a relatively unique system which allows the producer sell the product at a competitive price. From a seed certification aspect the potatoes are classified as a year older than conventional type minitubers and are, accordingly, of a lower value than conventional ones. There is no supply of pre-basic seed from this operation into the certification scheme with most of the minitubers exported to seed breeding companies in Europe.

In 2001, 2002 and 2003 Tops output met the requirements of the FSI seed certification area. However, these latter years coincided with a period when the certified seed area fell by a third from 1999 levels (and by over half from 1995). The shortfall in the certified seed requirements across all the classes was made up by imports which now account for approximately 20% of certified seed used in Ireland.

Alternatives to the current operations

Other than growing and maintaining their nucleus plots, there is no state involvement in the production of pre-basic seed in Northern Ireland or Scotland other than in inspection and control of seed standards. A similar situation obtains in the Netherlands.

In Northern Ireland minituber production is carried out by a private grower. DARD supplies and tests the mother tubers and is involved in the inspection of the resultant crop. Several other private growers are involved in the multiplication of pre-basic crops prior to the VTSC grade. Pre-basic seed production is fully integrated with the seed potato certification scheme which is controlled by two senior inspectors and 13 inspectors in the field with administrative backup from DARD headquarters.

Historically, the Scottish system was somewhat similar to the current Irish system for producing early generation seed. Up to the late 1980's micropropagated plants were produced at the state owned East Craigs Research Station. Seed tubers as first years clones were then issued to approved producers of high grade seed. There was some attempt made in planning the movement of potatoes into the seed system through a growers association but in general clonal material was made available on request. For many of the varieties which were under plant breeders rights, seed was commissioned by the breeder or his agent according to their market requirements.

State involvement is now very limited in Scotland with the role of East Craigs focused on holding virus-free germplasm, quarantine for imported varieties, testing for virus diseases and carrying out potato cyst nematode soil tests. The germplasm held at the East Craigs Station is supplied to private companies including breeding companies who carry out the

[12] CEAS Report 'Irish Seed Potato Sector Review Study' (October 1997)

micropropagation and pre-basic basic seed production. Decisions on what varieties and volumes to be entered at the top of the multiplication pyramid are totally determined by the market with most pre-basic material produced on contract with breeders, breeders agents, growers for ware and/or processing markets.

The varieties and quantities of seed required are therefore determined by the market place subject to contractual arrangements, unlike Ireland where formerly, Tops management have to estimate the needs of the market place. Since 2000, Tops have been moving in this direction also.

Costs to the state are therefore, minimal, compared to Ireland where the production of pre-basic seed is highly subsidised with returns from the sales of seed representing a fraction of the actual costs of production.

A summary of how the pre-basic seed production is organised in these regions compared to Ireland is outlined in the following Table 67.

Table 67: Comparisons of early generation seed multiplication systems

Country/Region	Feature
Ireland	Virus free germplasm controlled and held by the State at the Tops Centre. All pre-basic material produced by the State, none of which is on contract. Approximately 50 tonnes of Prebasic2 seed sold each year at €635 per tonne which represents about 5% of the costs of production.
Northern Ireland	Virus free germplasm provided by DARD to a private propagator who grows microplants and minitbers. Minitubers are sold to growers to produce Pre-basic stock. which in turn enter the seed certification scheme. DARD carries out inspections on a cost recovery basis.
Scotland	Virus free germplasm is controlled by the State at its East Craigs Research Station but made available to any person or organisation that requires it. The production of minitubers and pre-basic material is totally in the hands of private businesses many who have links with potato breeding and trading. Fees charged by the State for services provided.
The Netherlands	Most of early generation material is produced through clonal multiplication by some 200 specialist producers. Minituber production which accounts for about 33% of total seed stock is undertaken by NAK[13] on an agency basis and by breeding companies.

The consideration of alternative means of producing pre-basic seed stock under the seed certification scheme in Ireland has been the subject of previous reports and reviews. The Scottish and Northern Ireland systems provide useful information in the examination of alternatives to the current approach in Ireland. Scotland, like Ireland and Northern Ireland, is recognised as a high grade zone for seed potato production under EU plant health legislation; both the Scottish and Northern Ireland classification system for certified seed potatoes are similar to the Irish system; both areas are the main source of seed potato imports into Ireland; Teagasc varieties are now predominantly propagated in Scotland; export markets once filled by Irish exports have now been replaced by exports from Scotland. Accordingly comparisons with the Scottish and Northern Ireland systems of pre-basic seed production are very apt in examining alternative methodologies here.

Quantity of pre-basic seed

Area

The average area of pre-basic seed grown in Tops per unit area certified is lower than in Northern Ireland and similar to Scotland as the following Table 68 illustrates.

[13] Stitchting Nederlandse Algemene Keuringsdienst (NAK) is responsible for administering the seed certification service under the supervision of the Ministry of Agriculture. NAK is funded by fees it raises from its activities.

Table 68: Comparisons of Classes ROI. NI Scotland 2002

	ROI		NI		Scotland	
Class	Area (Ha)	% of Total	Area (Ha)	% of Total	Area (Ha)	% of total
Pre-Basic	4 Ha	0.25	4.1	0.37	32.37	0.25
Foundation/VTSC	70	4.5	27	2.5	403	3
S Elite	868	56	575	53	10191	79
Elite	580	38	381	35	2114	16
Class H or Class A	21	1.4	92	8.5	109	1
Total	154 1543	100	1080	100	12849	100

The ratio between pre-basic seed area and certified seed area for the three regions is as follows:

Ireland 1 Ha Pre basic area :386 Ha certified area
Scotland 1:396
N. Ireland 1: 263

Using the Scottish ratio, the total pre-basic seed requirements for Ireland would be 3.9 Ha (1539/396) which is the Tops position in 2002. It should be noted, however, that the Scottish seed potato sectors is about 10 times the scale of the Irish sector and protected varieties comprise most of their production.

In Northern Ireland there are 21 growers who produce 2 hectares of Pre-basic 1 seed. A further 2.13 hectares of PB2 and PB3 is also grown bringing the total to 4.13 hectares. The estimated quantity of pre-basic seed sown to produce the VTSC1 crop (similar to FS1) in 2002 was 22 tonnes.

In Scotland the 32 hectares of pre-basic seed was planted by growers in 2002 to meet the requirements of 12,849 hectares of certified seed area.

Protected varieties and Free varieties

While free varieties currently dominate the seed and ware market in Ireland, the situation is rapidly changing with the increase in the planting of the IPM controlled Rooster variety. In 2002 Rooster made up 31% of the area planted for ware and 18 % for certified seed. Some free varieties, particularly Record, continue to decline.

The degree to which the free varieties are multiplied within the seed certification system is very inefficient as already outlined. In the case of the free varieties, less than one third of the pre-basic material produced by Tops would suffice if its propagating ratio was equivalent to that of the Scottish seed certification scheme. There is also a high proportion of material produced which receives very little propagation in the seed certification scheme and, accordingly, its discontinuation would have little or no economic impact on the sector. It is also apparent that the quantity of pre-basic seed that fails to reach the market is very high at 38% (see page 70 for explanation) while a considerable proportion of the seed entered for propagation in the Foundation Stock classes ends up being classified to lower levels or being rejected altogether from the seed certification scheme. Factors relating to potato diseases are the main causes of this downgrading or rejection. IPM have cited disease factors as the main reason for moving their operations to Scotland.

Quantity of Pre-basic seed required to propagate the main varieties

Using the certified seed output from the two main protected varieties, Rooster and Cara, as a basis for determining the propagating efficiency of pre-basic seed then the pre-basic material requirements for some 94% of the Irish potato crop would be 12.8 tonnes as outlined in the following Table 69.

Table 69: Pre-basic seed requirements for the main Irish Certified Seed crop on the basis of Rooster propagating ratio

Variety	Pre-basic seed Tonnes Tonnes Produced in 2001	Required (Estimate)	Seed quantity certified in 2002 Tonnes
Rooster	4.2	**4.2**	3397
Kerrs Pink	7.5	**3.5**	2767
British Queen	8.2	**1.2**	945
Record	4.9	**1.1**	858
Lady Rosetta	0.2	**0.6**	510
Golden Wonder	4.05	**0.8**	642
Maris Piper	3.35	**0.2**	133
Saturna	2.30	**0.5**	409
Home Guard	4.5	**0.2**	131
Cara (IPM Variety)	1.54	**0.5**	429
SubTotal	**40.74**	**12.8**	**9921**

In this example less than 13 tonnes of pre-basic seed would be required to provide some 92% of current certified seed levels if the same degree of multiplication applied to all the main varieties as for Rooster (15.7 tonnes of Rooster seed was certified per hectare in 2002.) The total area required to produce this quantity should be about 2 hectares using current rejection rates (38%) at Tops. At lower rejection rates, say 10%, the area required would be lesser again.

Of the total 56.82 tonnes of pre-basic seed sold from Tops in 2001, 13 tonnes were IPM varieties. In Scotland, where IPM have a strong presence, the company is responsible for producing its own pre-basic seed material through the seed certification services. A similar approach could be adopted in Ireland by the company where private growers would carry out the service. A similar approach could also be adopted in Ireland or in conjunction with Teagasc at its Oakpark Centre where all the IPM controlled varieties are bred.

From the Table above the pre-basic seed requirements for the main *free* varieties amounts to about 8 tonnes assuming a multiplication efficiency of Rooster proportions. At even half this level of efficiency the requirements would be still relatively moderate at 16 tonnes. The production of pre-basic seed for these *free* varieties could be carried out by private operators as in Northern Ireland and Scotland with the germplasm provided by the State. As in the case of its own varieties, Teagasc could also provide the germplasm for these *free* varieties on a commercial basis.

The remaining *free* varieties produced at Tops make little contribution to the potato industry and their discontinuation would have little economic impact. However, germplasm could be provided for private operators to breed these varieties if they so wish.

The centralisation of all breeding, propagating and related activities in the Teagasc Research Centre at Oakpark should be considered. Scotland, which has 10 times the seed area as Ireland, has only one centre. Apart from reducing state costs on the scheme it could help to reverse the decline in seed potato production and the increasing level of seed imports. Some of the factors for consideration are as follows:

- Excellent reputation for potato breeding and research.
- Contribute to the integration of the Teagasc breeding programme with pre-basic seed production and the seed certification scheme.
- Field research already carried out in the Teagasc breeding programme shows that early generation seed can be grown without succumbing to virus diseases.
- Drier climate in east of country and, accordingly, reduced incidence of bacterial diseases associated with wet conditions, e.g. blackleg.

- Locations along east coast have equally low aphid populations as the west coast and therefore unfavourable for virus spread by aphid vectors.
- Most of the ware production now in the east of the country and over half seed area in East and South and half the seed certified.
- Could provide stimulus for seed potato production in east of country and better integration between seed and ware production.

Alternatively, Oakpark could provide the germplasm for propagation by private operators similar to the situation in Northern Ireland and Scotland. In this regard some kind of similar scheme to the Bord Glas minituber scheme could be put in place.

Ceasing all Activities

The likely scenario to arise if the Tops programme ceased altogether without any alternative arrangement for producing pre-basic stock, would be, in the short term at least, for early generation material to be imported from Scotland and Northern Ireland. These imports may be as minitubers or seed of later generations which would enter the Irish seed certification service and/or ware production. While it is possible that private enterprise would take up from the state, economic considerations would be the main determinants of this possibility. IPM would produce pre-basic seed for its own varieties in Ireland or in Scotland whichever would be the more economical. In the current situation pre-basic seed is supplied to IPM below its full economic cost while in the case of the seed certification scheme there are no charges levied for inspection work. If the pre-basic seed is produced in Scotland then later generation seed may also be produced in Scotland and exported to Ireland. There would be less attraction by private enterprise in the production of pre-basic seed for the free varieties because of the uncertainty in the market and the absence of royalty income.

However, the experience with the Bord Glas minituber Scheme has shown that a commercial operation is feasible. Following three years after its commencement in 1992, Pre-Basic 2 stocks of 149 tonnes were available for the market from the Bord Glas scheme with production maintained at this level for the following three years until 1998 before falling to zero in 2000 when the subsidy was withdrawn.

The ceasing of all activities in relation to the production of Pre-Basic seed could leave the potato sector open to entry of quarantine diseases and impact on the security of seed supplies. The entry of exotic diseases would deprive us of the high health status associated with the country and, accordingly, severely limit the possibility of regaining our previously important position in the seed export trade.

Becoming self sufficient at least in seed potato supplies should be a key policy objective with the maximisation of returns to the economy from state funded research programmes. In this regard the need to have full control of early generation potato seed is paramount.

The experience in Tops to date shows that there is a high risk of disease breakdown by having all the Pre-Basic seed propagated in one location. The growing of the pre-basic seed on farms in diverse locations would help to limit this to a considerable extent.

2. Other activities carried out at Tops

DUS testing of Varieties

An average of six new varieties are tested each year for distinctiveness, uniformity and stability at a charge of €507.90 per variety. There has been limited change in this work over the past 10 years. This activity could also be carried out by the Variety Testing Division in conjunction with the trial work on potato varieties.

Maintenance of germplasm/national collection of potato varieties
Over 400 varieties are maintained in vitro in the Tops laboratory. The Department are the maintainers of all free varieties. Both the Department and Teagasc are listed as joint maintainers of Oakpark bred potato varieties.

Laboratory Testing for potato diseases and residues
Over 4,000 potato leaf samples taken from crops grown under the seed certification scheme are dispatched annually to the Tops Laboratory by DAF seed potato officers. The results of these tests determine the classification or rejection of the seed potato crop. Apart from 1992 and 1994 when no samples were tested, the number of tests have averaged 4,400 over the period under review. In addition the centre tests for fungicide residues with an average of 45 tests per annum carried out since 1994. There were no tests carried out in 1992 or 1993. These tests are carried out under the conditions of the seed certification scheme.

These tests could also be carried out by Teagasc at its Oakpark Centre as part of its virus screening programme in the selection and breeding of new varieties. In the case of residue testing for fungicides, such activity is already being done for all foods in the Department's Pesticide Laboratory at Abbottstown.

Sale of Microplants to Commercial Companies

The sale of microplants to private companies for further propagation is now a relatively minor activity in Tops compared to the period when it supplied the material for the Bord Glas minituber scheme. In 2002 some 170 plants were provided to a private operator realising an income of €127.50.

2.5.1.6 Options and Outcomes

The involvement of the state in the production of pre-basic seed material has impacted on the entry of private operators into this segment of the market. The seed produced is sold at prices which are only a fraction of their actual cost. While only 4 hectares of the Tops farm is used to grow Pre-Basic seed, the whole 80 hectare farm and facilities at Tops is a charge on the pre-basic seed output of approximately 50 tonnes per annum. This is in direct comparison with the situation in Northern Ireland and Scotland where state involvement is minimal and where all the seed is grown privately. It has been shown in the Bord Glas scheme that Pre-Basic seed could also be produced here both economically and efficiently by private enterprise, albeit, with some subsidy initially.

The present subsidised system interferes with the development of strong market signals which would in normal circumstances determine the quantities and varieties of Pre-Basic seed required for the certified seed grower. The absence of such vertical linkages between seed growers and ware producers is continued higher up along the chain to the detriment of the industry.

There is also the need maximise the use of the state's research facilities and programmes and fully exploit the contribution of research to the agriculture and national economy. In this regard the operation of two state research facilities – Tops and Oakpark- may be questioned on economic grounds considering the relatively small scale of the seed potato sector in Ireland. Secondly, the fact that most of the Oakpark bred varieties are now propagated in Scotland rather than in Ireland should be taken into consideration. Accordingly, the Tops Centre must be considered within an overall policy framework and its contribution to the development of a competitive Irish seed potato sector.

The options and outcomes arising from the preceding analysis are summarised in Table 70.

Table 70: Options and Outcomes for Tops Activities

	Option	Outcome	Financial implications
1	Tops Laboratory to be retained with activities limited to maintenance of varieties and production of germplasm for supply to commercial companies.	This option would be similar to that of the Scottish state run East Craigs research Station. A select number of growers would produce the minitubers and pre-basic seed as in Scotland and Northern Ireland.	Laboratory running costs would be the main costs – staff and equipment. (Tops farm no longer required) Staff and operational cost savings would be of the order of €300,000. State subvention as in the former Bord Glas minitubeer scheme where growers could be subsidised initially.
2	Teagasc Oakpark would carry out all laboratory functions currently carried out in Tops including the maintenance of potato varieties, testing for diseases etc	Teagasc would provide the germplasm for the private production of minitubers which would be sold to select growers to produce pre-basic seed. (A variation on this would be for Teagasc to also produced the minitubers on a commercial basis). Some capital investment in facilities would be required at Oakpark.	Savings of approx €500,000 per year in salaries and operating costs of the station. Savings on capital resources at Tops Capital investment in Teagasc facilities required. State subvention as in the Bord Glas minituber scheme, initially.

2.5.2 Seed Certification Services

As outlined in section 2.5.1, potatoes degenerate with each subsequent propagation due to diseases, pests and tuber deformities. There is, accordingly a deterioration in the quality and appearance of the potatoes which has a major impact on consumption while yields and returns from the enterprise for growers may be considerably reduced. The Seed Certification Scheme ensures that there is high quality seed available for growers and only such seed can be marketed.

2.5.2.1 Objectives

The primary objective of the Seed Potato Certification Scheme is to certify that potatoes of any variety grown from approved seed are true to name and conform to both tuber and health standards prescribed by the EC and national legislation. According to community legislation on the marketing of seed potatoes, seed crops must fulfil defined standards in respect of varietal identity, varietal purity, previous cropping, isolation distances, plant health, weeds and other conditions. The satisfaction of such standards is subject to an official examination.
Productivity, food safety and traceability, and environmental safety are now key issues. The major factors affecting productivity are as follows:

(i)Trueness to name and purity of variety
Potato varieties cannot easily be identified by the customer from the tuber characteristics alone, hence the advantages of a system which guarantees trueness to name and purity of variety. The yield of the potato crop and the demand for the produce on the market depend on the variety grown. There are a large number of varieties, many with similar tuber characteristics, but with different qualities, intended for different uses, and having a diverse price range. Consequently it is essential, when purchasing seed or ware potatoes, to have an assurance that the variety is true to type, has a high standard of purity, and the customer is getting the product intended.

(ii) Health Standard of potato tubers
Heavy losses in potatoes also arise from tuber diseases and tuber damage. The principal diseases of tubers are Potato Blight, Common Scab, Powdery Scab, Skin Spot, Black Scurf, Silver Scurf, Black Leg, Soft Rot, Dry Rot and Gangrene. Some of these develop while tubers are still in the soil and may continue to develop after lifting. Dry Rot and Gangrene develop during storage from infection picked up in the soil during harvesting, during subsequent handling and in stores. Tuber damage may render the tubers unsaleable and increase the risk of infection.

Virus diseases
Virus diseases may reduce the yield of potato crops by from 5% to 95% depending on the type of virus infection and the extent to which the stock is infected. The superior yielding capacity of certified seed is due mainly to their freedom from virus as well as from tuber diseases.

Degeneration of potato stocks
Degeneration of potato stocks is due mainly to diseases caused by viruses. The principal viruses, which cause degeneration of potato stocks in Ireland, are spread by species of greenfly or by contact between diseased and healthy plants. Potatoes can also become infected with viruses, which are soil-borne. After initial infection, viruses, which are transmitted by contact spread gradually through the entire crop. The spread of insect transmissible viruses is very dependent on weather conditions. Greenfly, which is responsible for the spread of Leaf Roll and Virus Y is relatively inactive in damp weather or when wind velocity is high. In other situations when conditions are more favourable for greenfly activity, virus diseases spread quickly and can be responsible for a rapid

deterioration in the health of potato stocks. The reduction in yield will be far greater if the crop is infected with the more virulent strains of Virus X and the more severe insect transmissible viruses such as Virus Y and Leaf Roll. The planting of health seed minimises the risk of infection with these viruses with a consequent higher yield obtained.

Potato Cyst Nematode (PCN, Eelworm)
Seed potatoes for certification may only be grown on land which is found to be free from PCN, based on the result of laboratory examination of samples of the soil. This ensures against the spread of the pest to clean land on the seed. PCN is one of the worst pests of the potato. Infestation builds up rapidly under successive potato crops. Severe infestation may result in almost complete failure of the potato crop. Experience indicates that PCN lives almost indefinitely in the soil. Farmers can prevent the introduction of PCN by using only Certified Seed Potatoes.

(iii) *Food Safety and Environment*
Food Safety and Environmental Safety are issues which have arisen with the advent of Genetically Modified varieties and are now covered in the seed potato marketing Directive. The emphasis on seed certification has changed from that of increasing agricultural productivity to that of food and consumer safety, and environmental safety. This corresponded with the transfer of responsibility for this area from DG Agriculture to DG SANCO (Health & Consumer Protection), in the European Commission.

2.5.2.2 Legal Basis for Seed Certification
The marketing of seed potatoes within the European Union is regulated by Council Directive 2002/56/EC. These rules relate to varietal purity, freedom from certain pests and diseases, the levels of certain other pests and diseases, physical parameters, and packaging, sealing and marking. The Annexes to Dir. 2002/56 set out the minimum conditions to be met by seed potatoes and the labelling requirements thereof. Member States are obliged to provide for a certification system if seed is produced for marketing in their territory.
The European Communities (Seed Potatoes) Regulations 1980, as amended by the European Communities (Seed Potatoes) (Amendment) Regulations 1980 to 2003 empower the Minister to establish a Seed Potato Certification Scheme. The Minister may appoint a body other than the Department of Agriculture & Food as the certifying authority. In a number of Member States (and UN/ECE countries), a body other than the Ministry of Agriculture is the certifying authority.

The Regulations state that seed potatoes shall not be placed on the market or imported unless they have been certified as basic seed potatoes. Ireland is a High Grade Seed Area, and only certified basic or pre-basic seed potatoes may be marketed in the State or imported into the State. This excludes certified seed potatoes (blue label seed). Authorised officers have authority to examine any consignment of imported seed potatoes, and if the consignment is found to be infected by disease, or infested with a harmful organism, the Minister has the authority to order the destruction of the consignment.

Under these Regulations, the Minister is obliged to establish a Seed Potato Register, and to register on this register applicant seed potato packers who comply with specific criteria.

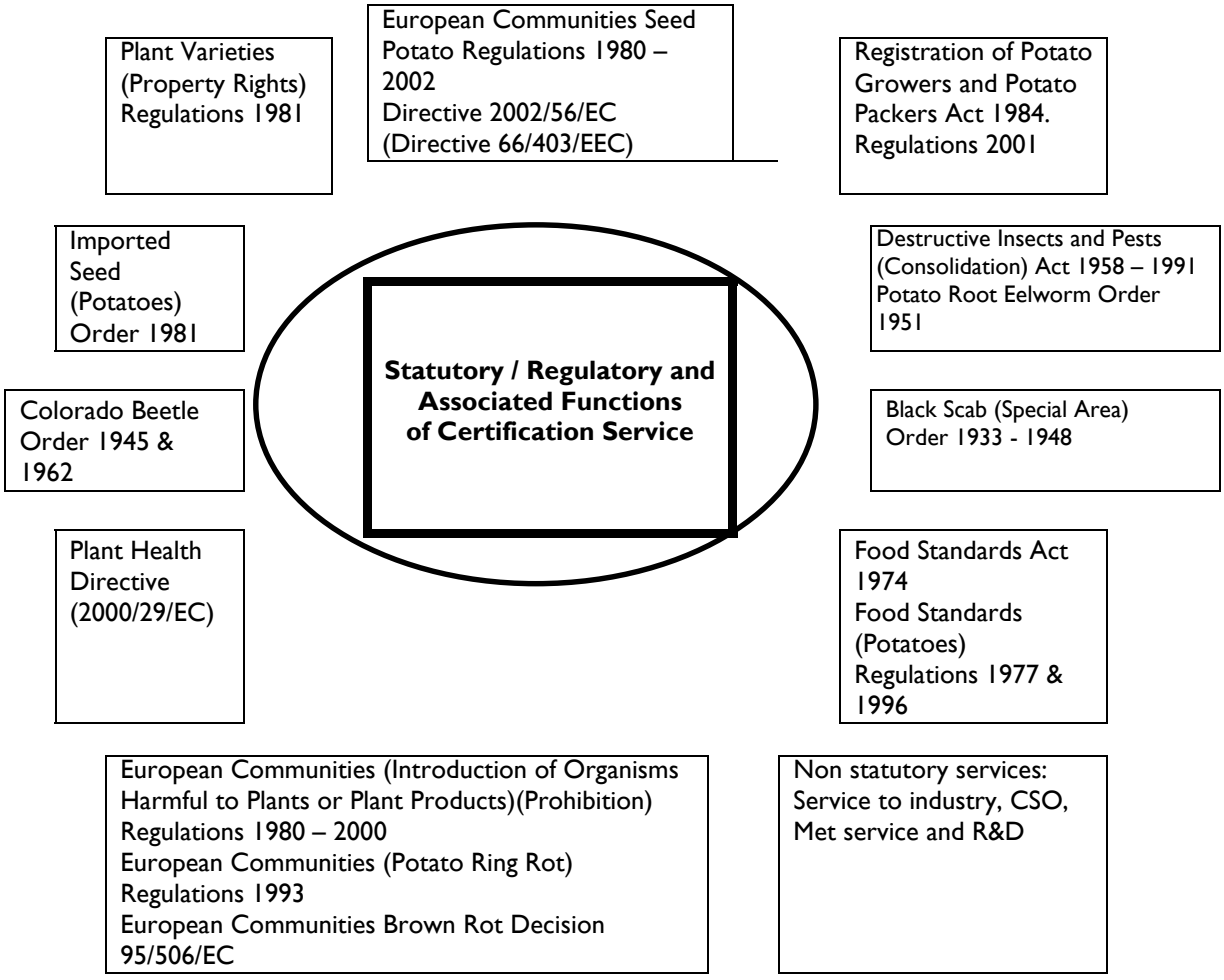
The schedule to the Regulations sets out the various minimum standards, general requirements and tuber tolerances and size requirements for basic seed potatoes, along with details of labelling and sampling procedures.

In addition to the Seed Potatoes Certification Regulations, the provision of the certification service involves the implementation of a series of other Acts, Orders and Regulations viz: Agricultural Produce (Potatoes) Act 1931, Potato Root eelworm Order 1951, Black Scab in Potatoes (Special Area) Order 1933 – 1948, Colorado Beetle Order 1945 – 1962, Imported Seed (Potatoes) Regulation Import Order 1981, European Communities (Potato Ring Rot) Regulations1993, Registration of Growers and Packers Act 1984 – 2001, Plant Varieties (Property Rights) Regulations 1981, European Communities Brown Rot Decision 95/506/EC

and Council Directive 98/57/EC, Plant Health Directive 77/93/EEC, Commission Decision 2004/3/EEC (High Grade Seed Area).

The statutory and regulatory functions carried out under the Seed Potato Certification Services is outlined diagramatically in Diagram 4.

Diagram 4 Statutory / Regulatory and Associated Functions of Seed Potato Certification Services



2.5.2.3 Operational Activities

The operation of the seed potato certification service is divided into five geographical regions – Northeast, South, West & Midlands, Donegal North and Donegal South. Each of these five regions is managed by a District Superintendent (DS), under the direction of the Area Superintendent (AS) who is responsible for all regions. The AS also has responsibility for the Cereal Seed Certification Service. The Seed Potato Certification service is under the control of professional management staff (inspectorate) based in Dublin (Backweston). Field-work is carried out by Technical Agricultural Officers (TAOs), who are given special training for this work.

The main components of the seed certification service which are necessary to implement the statutory and other requirements of the certification system may be summarised as follows:

- Administration
- Field Inspection Service
- Diagnostic Testing Service
- Monitoring & Control

Administration
The Potato Inspectorate for the most part, administer the seed potato scheme.
This involves:

- The issuing, receiving and receipting of application forms.
- Checking and processing application data.
- Issuing of crop reports.
- Issuing crop certificates.
- Issuing Plant Passports
- Issuing of Phytosanitary certificates (Seed and Ware).
- Notifying landowners of Potato Cyst Eelworm outbreaks and serving appropriate notices.

Field inspection service
This involves the inspection of land to establish location, rotation, restrictions and isolation. Crop inspections are carried out to verify varietal purity; the production area approved compared to the declared area; the health status and classification grading; and to ensure that the crop meets all other conditions of certification.

The field inspection standards required for the seed certification scheme are outlined in Annex 9. Seed inspectors submit appropriate foliage samples for diagnostic testing to determine if the crop meets these standards. Foundation seed must be totally free of varietal impurities, specific viral diseases and blackleg. The requirements for other classes are less severe in descending order.

Tuber inspection:
This involves approving seed for planting and inspections at harvesting and storage followed by certification and labelling.

Diagnostic Testing Service
Seed inspectors submit appropriate samples for diagnostic testing.

Test	Laboratory
To confirm presence and identity of viruses	Tops potato Laboratory
To determine chemical residue levels	State Laboratory
To confirm Freedom from Ring Rot and Brown Rot	State Laboratory
To confirm freedom from pests	Teagasc Kinsealy

Monitoring & Control
To ensure the highest standards are observed in the certification scheme the following controls are in place:
National plots: representative samples from crops for certification and from certified tubers are planted in pre- and post-control plots to monitor compliance with classification requirements and operational standards.
European Community Comparative Field Trials: representative samples from the certified crop selected by EC inspectors are planted in Comparative Trials with other community-wide samples to determine compliance with EC directives.

General Requirements for Seed Potato Production
The following general requirements for seed potato production apply:

- Growers must make an official application and meet certain requirements and follow specific procedures.
- The production ground must not have been cropped with potatoes within at least the three preceding years.
- The production area must be free from Wart Disease
- The production ground must be systematically sampled and found free from Potato Cyst Nematode

In addition the crop and produce must be free of a number of other diseases and pests. Some importing countries stipulate that purchased seed must not have been produced within specified distance limits of where certain diseases have been found. In the case of Ireland this stipulation applies to Wart Disease.

Crop Classification
Crops are classified on the basis of national/EC classes as outlined below.

Irish Classification	EU Classification	UK	
Pre-Basic 1		Pre-basic 1	
Pre-Basic 2		Pre-basic 2	
		Pre-basic 3	
Foundation 1	EEC 1	VTSC 1	Basic Seed
Foundation 2		VTSC 2	
Super Elite 1		Super Elite 1	
Super Elite 2	EEC 2	Super Elite 2	
Super Elite 3		Super Elite 3	
Elite		Elite I	
		Elite II	
Class H	EEC 3	AA	
Certified		CC (England&Wales)	

Foundation Seed
The production of foundation seed is a critical stage in the multiplication process. The first generation, FS1, is produced by 20 foundation seed growers who purchase pre-basic 2 seed from Tops or other sources. The FS1 seed is multiplied again the following year, mainly by the same growers, to produce FS2 seed. The quantities of FS1 and FS2 produced between 1992-2002 are outlined in the previous section (see Table 50).

Because of the critical role that Foundation seed plays at the top of seed potato pyramid, very high standards of hygiene are required in its production. Foundation seed stock has therefore to be grown in isolation from potato crops with a lower health standard (See Annex 10). To reinforce the controls and avoid cross contamination between foundation seed and other seed, there is also a separation of duties at inspectorate level where inspectors are assigned specifically to foundation seed.

Basic Seed
Only certified seed potatoes of *pre-basic* and *basic* categories may be planted in Ireland, the lower category "certified seed" is not allowed due to our high health status. Basic seed, like the other categories is divided into various classes for certification purposes. The major part of the certification service deals with this basic category.

Protected Zone Status & High Grade Seed Area
Under EU Plant Health legislation, Ireland holds Protected Zone Status for certain specified pests and diseases. In addition under the Seed Potato Marketing Legislation, Ireland is one of the few regions in the EU which is a High Grade Seed Area for seed potato marketing. The other High Grade Seed Areas are Northern Ireland, Scotland, the Azores, and parts of northern England, parts of Germany and parts of Finland. Some importing countries restrict their imports to seed sourced from these High Grade Seed Areas.

Under the terms of the European Communities (Seed Potatoes) Regulations 1980 – 2003 and taking account of Commission Decision 2004/3/EEC granting High Grade Seed Area Status, all commercial potato crops grown in High Grade Seed Areas must be grown using certified basic seed potatoes or the direct progeny thereof. Accordingly, Ireland was obliged to introduce a system to facilitate this requirement.

Following the recommendations of the Expert Group Report[14] on the Seed Potato Industry a field classification (Class X) was introduced in 2002 under which crops planted with certified basic seed may be classified for on-farm use as seed in the following year. Class X seed is for home, on-farm use only and may not be marketed. The minimum field classification standards are the same as for Class H. This classification was introduced to ensure that all commercial potato crops grown in Ireland use certified basic seed potatoes or the direct progeny thereof.

Certification staff inspect all crops entered for Class X classification, using the same general procedures as for other crops. However the staff input is substantially less; soil sampling is done only pre-crop and on a less intensive basis; crops are generally inspected only once and no further inspections are required as the tubers are not certified. Certificates are issued for crops that meet with field standards. An X classification is awarded to crops grown from certified basic seed (with the exception of Class H) intended for home use. Potatoes produced from Class X seed are not eligible for entry for X classification in the following year. Growers who produce Class X seed are required to furnish to the local inspector details of the quantity used as seed in the following season, for each variety. From 2003 individual ware growers are also audited to check records prescribed under the Seed Certification regulations and the Growers and Packers Regulations, 2001 regarding the source of seed planted.

Crop and Tuber Standards
In the certification process, an inspector will have made numerous visits to the farm - twice for soil sampling, crop inspection on at least three occasions, prior to and during harvesting and storage, and on numerous occasions as seed lots are graded, certified, sealed and labelled, depending on marketing arrangements. In the case of Class X, soil samples are taken prior to planting only, and crops are inspected, as a general rule, at least once in the growing season.

Pre-Control & Post-Control
Pre- and post-control involves the planting in small plots of selected samples of tubers from seed stocks countrywide, as a post-production check on the standards achieved in field classification and seed production. For those samples which represent stocks which are

[14] Expert Group Report on the Seed Potato Industry (2000)

being further multiplied in the current year, the post-control plots are in effect pre-control plots. One DS and two TAOs have responsibility for this work.

Non-Statutory Duties and Other Services (Including Linkages)
Potato officers also provide other services, in addition to seed certification, to the Department and to the industry in general. This involves several internal and external linkages. Internally the service has links with Tops Farm, Crop Production and Safety Division and Food Division. The following external linkages are also in place:

- Potato Survey (Bord Glas Survey): conducted each year in conjunction with Teagasc advisory service and Bord Glas.
- Potato Blight Reports: Field staff, in conjunction with Teagasc and the MetEireann monitor and report on blight outbreaks.
- Cooperation with Teagasc in relation to Monitoring of Blight Resistance
- Research and Development: Seed Potato Certification staff collaborate with the UCD Plant Pathology Department and Teagasc in various research projects including diseases and pests of potatoes..
- Industry meetings / field days: Staff cooperate with the Teagasc advisory service in relation to field visits, grower meetings and staff training.
- Both the State Laboratory and Teagasc provide analytical services in support of the certification scheme and plant health controls.

2.5.2.4 Outputs and Outcomes of Seed Potato Certification Service

A summary of the outputs and outcomes of the Seed Certification Service for 2002 is provided in the following Table 71. These activities and operations follow a seasonal pattern which are outlined in the subsequent Table 72. The peak workloads occur during the scheme application, soil sampling, crop and tuber inspection. Staff requirements are based on the provision of services at these peak times. These outcomes and associated inputs are outlined in detail in this chapter.

Table 71: Summary of Inputs, Outputs and Outcomes of the Seed Certification Service 2002

INPUTS	OUTPUTS	OUTCOMES	
		Immediate (Scheme)	**Long-term (Sector)**
Administration	Servicing of 468 applicants / files and associated records	Grower and crop profiles for policy & work planning & control	Successful scheme management and sectoral policy
Crop inspections and Classifications Seed Crops Class X Crops	726 Plots 1652 hectares 1399 hectares	Establish a published list (excluding Class X) of varieties and classes to provide certified seed supplies to the sector. Also, provide approved farm saved seed	Consistent supply of home grown certified seed free from PCE and meeting other prescribed standards. Approved seed for producers own farm saved use (Class X)
Seed inspections and Passporting	20,306 tonnes	The supply of certified seed meeting prescribed standards.	Quality seed and ware product providing assurance and full traceability
Movement Passporting	2445 tonnes	Compliance with passporting legislation	Authentic traceability for subsequent certification
Soil sampling (PCN) Seed crops Ware crops	6314 samples 1779 samples	Approving land for seed production. Identification of infested land.	Containing outbreaks and protecting through restrictions those outbreaks from contaminating other lands.
PCN control and compliance checks	30 Prevention notices served 325 compliance checks.	Immediate restriction on infested land and prevent contamination of clean land	Contain outbreaks and protect the potato industry as a whole
Foliage samples – ELISA Tests	1592 samples	Confirmation of virus disease status	Production of virus free seed
Post Control samples	217 national samples 9 EU samples	General picture of standards nationwide & compliance levels Disease surveillance	Ensure uniform application of standards Disease management information.
Training and observation plots	135 plots	New Staff & Refresher training Variety Identify , Off-type and disease identification	Staff skills development and information backup.
Chemical residue sampling	42 samples	Establish levels and the protection of tubers	Disease control and added value to seeds.
Ring Rot/Brown Rot Sampling	524 samples	Comply with statutory requirements re Quarantine Organisms.	Maintain status as disease free country. Protect the potato industry.
Phenelamide resistance sampling	12 samples	Identification of blight strains	Fungicides and spraying programme - plan for maximum effect
Potato area and growers survey	776 grower report sheets	Data for National Potato Census (Bord Glas)	Industry information, policy and development.
Ware product inspections (ware component of seed production)	1,399 inspections 28,200 tonnes	Implement quality and traceability standards	Consumer satisfaction, avoidance of complaints at wholesale / retail outlets
Plant Passports/Labels issued	45,000 labels	Traceability Legislative compliance	Traceability and sector and customer confidence
Yields / Stocks / Prices	Monthly reports	Regular update on sales, prices and stock balance.	Statistics for CSO, policy development.

Table 72 provides a display of the annual work cycle. The peak work-load occurs in the months of June, July, August and September. Other duties, if and when required, would be accommodated in the above cycles e.g. aphid trap surveys, Elisa test surveys, material selection for demonstration and training plots, agricultural shows, etc. Some staff are transferred to other duties during off peak periods.

Table 72: Annual Work-Cycle – Seed Potato Certification and Ancillary Functions

Function	Operational Period												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Seed Certification (export) (Tuber Inspection)	Nov– February	x	x									x	x
Seed Certification (home) (Tuber Inspection)	Nov – May	x	x	x	x	x						x	x
PCN Soil Sampling (pre crop)	November – May	x	x	x	x	x						x	x
Post Control (EU Comparative Trial)	Sample selection- Dec- Jan; Assessment Inspections- May	x				x							x
Post Control (National)	Sample selection- Jan- Mar; Assessment Inspections- July	x	x	x				x					
EU Ring Rot / Brown Rot survey	January - March, Oct	x	x	x							X		
Ware inspections - Producer/Packer	Oct – May	x	x	x	x	x					X	x	x
Plant Health / Phytosanitary Certs	Oct - April, when required	x	x	x	x						X	x	x
Chemical residue, seed sampling	Post harvest and pre seed certification	x	x	x						x	X	x	x
PCN Prevention 'Notices'	As required following soil test	x	x	x	x	x	x	x	x	x	X	x	x
Investigating complaints - seed	Nov – May when required	x	x	x	x	x						x	x
Imported seed inspections (Non-High Grade Seed Areas)	When required - usually Springtime			x	x								
Investigating complaints - seed & ware crops	March – Oct, when required			x	x	x	x	x	x	x	X		
Early ware /crop reports and data	March – July, in relevant Districts			x	x	x	x	x					
Various Plots / Plant/Harvest	April / Sept				x					x			
Scheme Applications	May / June					x	x						
PCN Soil Sampling (Ware crop)	May / June					x	x						
Crop Inspections	June – Sept						x	x	x	x			
Colorado Beetle	Where necessary including crop checks						x	x	x	x			
Farm maps / Rotational records	Usually June and/or Sept						x			x			
Crop blight, initial outbreaks / regular reports to Met Eireann	June – Sept						x	x	x	x			
Phenylamide resistance / sampling	June – Sept when required in selected areas						x	x	x	x			
Black Scab monitoring inspection	July (one week) in relevant Districts							x					
PCN Soil Sampling (post crop)	August / September								x	x			
Potato Acreage survey (Bord Glas)	Aug / September								x	x			
Yield estimates, seed & ware	Sept / Oct									x	X		
Administration, reporting, training etc.	Ongoing	x	x	x	x	x	x	x	x	x	X	x	x

Qualitative Analysis of Inspector Performance

While the work of the inspectorate is monitored by immediate supervisors, qualitative monitoring has also been effected by various external audits and reviews, as well as through Post-Control evaluation.

- **EU Audit**

  The Food & Veterinary Office of the European Commission in its audit mission report (1241/1999) states in its conclusions that the plant health system in the potato sector operates effectively.

- **Expert Group Report**

  The Report[15] of the Seed Potato Industry Review Group accepted that the Seed Certification Scheme is effectively administered and that standards and tolerances applied are in conformity with EU requirements. This report also stated that the sector requires considerable technical competencies and that staff mobility within the Department should take account of the skills and experience needs of the seed potato sector. It was the Group's view that while potato inspectors can readily adapt to the work of other sectors, the opposite is not the case and that an appropriate staffing strategy is necessary to ensure that there are adequately trained officers available to replace the expertise of retiring and promoted officers.

- **EU Comparative Trials**

  Recent Commission reports indicate that Irish seed potatoes meet with the required standards for the High Grade Seed Areas, and has amongst the highest standards in the Community in relation to plant health standards and varietal purity. The following diagrams (Diagrams 5, 6 and 7) are taken from the Official Report of the EC Comparitive trial for Seed Potatoes, 2002.

- **National Pre-Control and Post-Control Tests**

  The increased emphasis on monitoring and evaluation in the past few years through an increased weighting on pre and post control and associated staff training has contributed substantially to recent improvements in Irish seed quality.

[15] Report of the Seed Potato Industry Review Group (September 2000) established to examine the findings of the 1997 CEAS Report

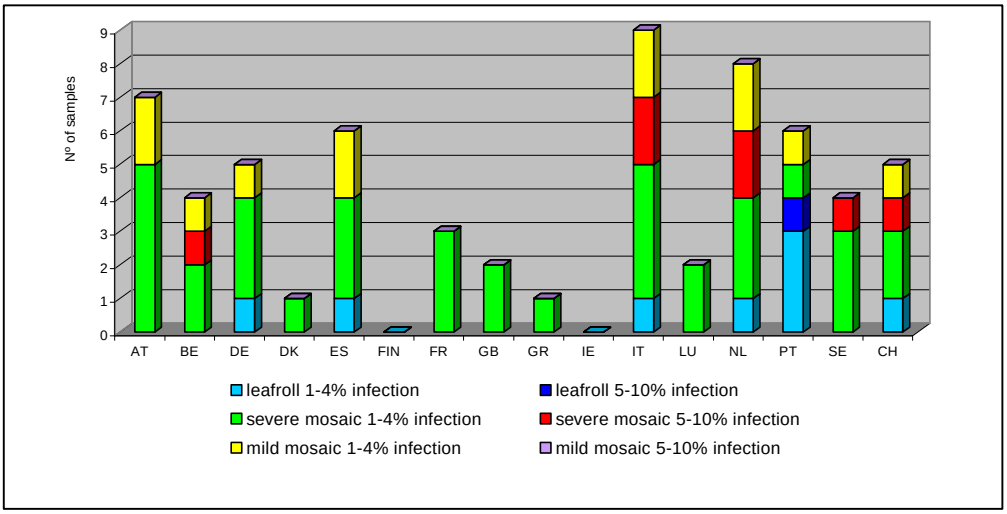


Diagram 5 –Relative levels of virus infection according to various levels of infection symptoms, in the plots of each country.

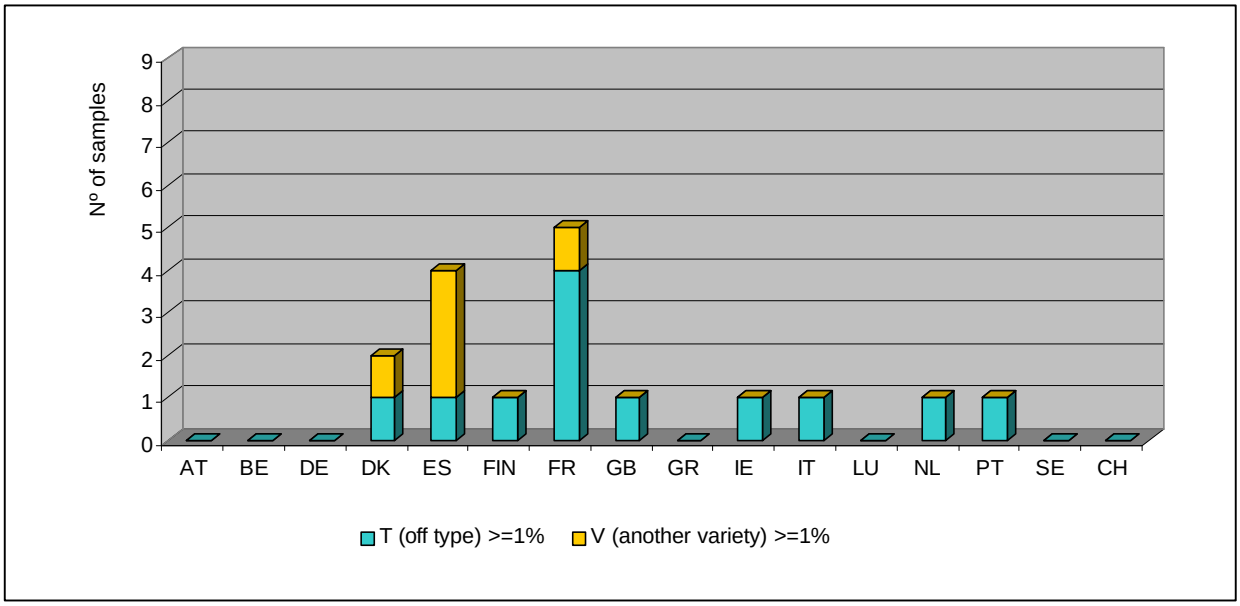


Diagram 6– Number of samples with off type plants or other varieties, in the plots of each country.

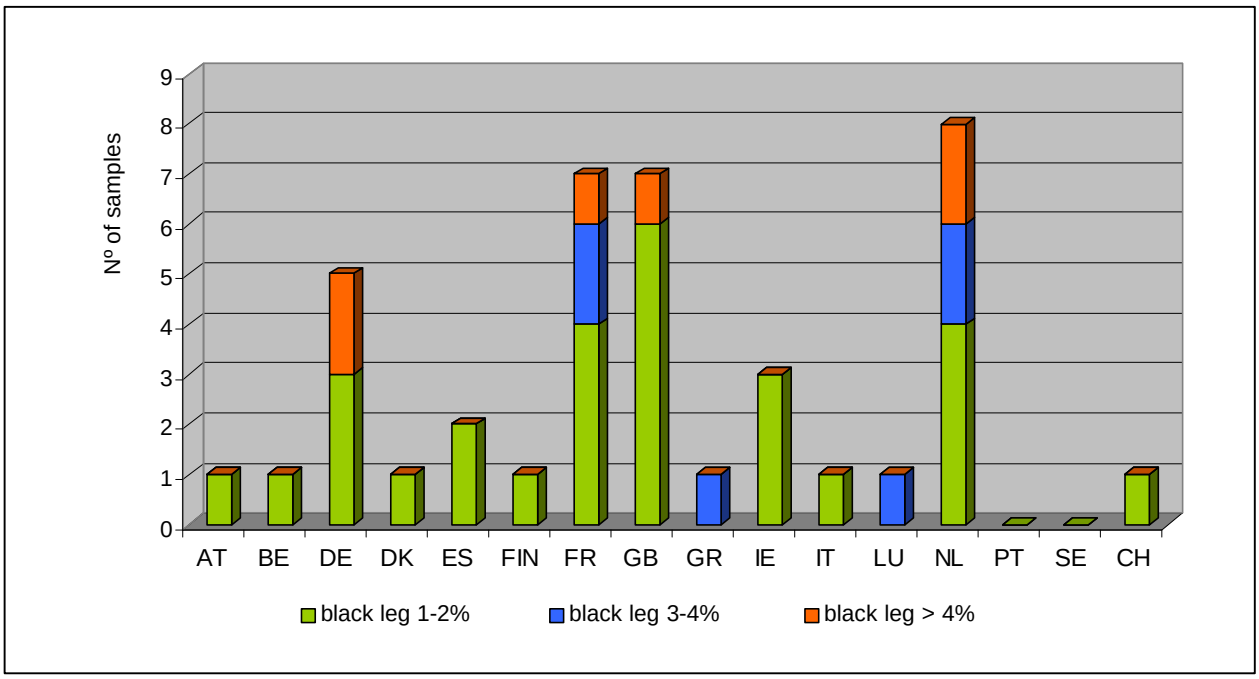


Diagram 7 – Cumulative number of samples with black leg symptoms according to various levels of infection, in the plots of each country

Physical Performance of Seed Certification scheme

Table 73 shows the changes in the area entered for inspection and classified for seed production over the period of the review. The Data for 2002 includes the new Class X which represents 46% of the area entered for certification (and inspected by DAF officers) and 42% of the area classified.

Table 73: Area Entered for Certification, Area Rejected & Area Classified 1992 to 2002

Year	Area Entered for Certification (Area Inspected)	Area Rejected	Area Classified	% Rejected	% Classified
	Ha.	Ha.	ha.		
1992	3512	660	2852	19%	81%
1993	3257	706	2551	22%	78%
1994	3175	328	2846	10%	90%
1995	3499	400	3099	11%	89%
1996	3678	675	3003	18%	82%
1997	2698	620	2078	23%	77%
1998	2521	303	2218	12%	88%
1999	2480	337	2143	14%	86%
2000	2057	276	1781	13%	87%
2001	1746	207	1537	12%	88%
2002	*3051	381	*2670	12%	88%
	*** Includes Class X (1399 Ha.)**		*includes Class X (1132 Ha)		

The area certified and the quantity of seed certified for the domestic and export markets is provided in Table 74**.** While both the area classified and the quantity certified have declined considerably, the quantity of Irish certified seed used on the home market has remained relatively stable at around 10,000 tonnes.

Table 74: Area of Certified Seed Potatoes Classified & Quantity Certified 1991 –2002

Year	Area Classified (ha.)	Quantity of Seed Certified (tonnes)		
		Home Trade*	Export	Total
1992	2,852	10,728	6,655	17,383
1993	2,551	11,346	6,600	17,946
1994	2,846	13,423	7,131	20,554
1995	3,099	12,115	6,014	18,129
1996	3,003	10,786	9,067	19,853
1997	2,078	9,759	7,849	17,608
1998	2,218	9,303	3,407	12,710
1999	2,143	10,625	7,819	18,444
2000	1,781	9,376	3,894	13,270
2001	1,539	11,026	3,014	14,040
2002	1,537	9917	441	10,358

* Seed passported for own use is not included in this figure. In 2002, 5230 tonnes were passported. See Table 74.

Table 75 below shows the distribution of certified seed and 'Class X' by region with a further breakdown in Table 76 showing the relationship between certified seed growers and Class X growers.

Table 75: Regional breakdown of Growers and Area Entered and Classified by Region in 2002

Region	SEED CROPS				CLASS X CROPS			
	Entered		Classified		Entered		Classified	
	Growers	Hectares	Growers	hectares	Growers	Hectares	Growers	hectares
East	30	419	27	389	73	833	65	666
West	42	170	38	163	14	93	14	66
South	76	365	69	349	73	313	65	250
Donegal South/East	51	277	48	244	39	78	35	69
Donegal North/West	63	421	62	392	15	83	15	80
Total	262	1652	244	1537	214	1399	194	1132

This data shows that nationally there are 194 growers of 'Class X' seed of which 67 also grow certified seed. These latter 67 growers account for 325 hectares or 30% of the total 'Class X' area and over a third (584 Ha) of the certified seed area. The East Region (Meath, Dublin, Louth) accounts for over 70% of the Class X area grown with practically most of this grown by 44 commercial ware producers.

Table 76: Regional distribution of seed growers and area grown

Region	Certified Seed Only		Class X Seed only		Certified Seed and Class X seed		All seed	
	No growers	Area classified	No growers	Area classified	No growers	Area classified	No growers	Area classified
North	85	388	22	38	25	355	132	781
South	45	189	51	137	24	277	120	603
East	13	259	44	576	14	220	71	1055
West	34	117	8	56	4	57	46	230
Total	177	953	125	807	67	909	369	2669

The output from the seed certification scheme and Class X for 2002 is presented in Table 77. The Class X output is 9892 tonnes or about 8.7 tonnes per hectare. The output of certified seed, including seed passported for own use, is 10.1 tonnes per hectare.

Table 77: Certified seed and Class X seed output 2002

Region	Certified Seed produced (sealed) Tonnes					Class X output Tonnes
	Home (1)	Export (2)	Passported (3)	Total 1+2	Total 1+2+3	
North	5075	45	1664	5120	6784	1497
South	1898	0	1666	1898	3564	2235
East	2297	396	1572	2693	4265	5502
West	647	0	328	647	975	658
Total	**9917**	**441**	**5230**	**10358**	**15588**	**9892**

Varieties Entered for Certification

The area classified per variety in 2002 is presented in Appendix 11. Of the 26 varieties certified, Kerr's Pink remains the dominant variety while Cara and Record continue to decline. Rooster accounted for 11% of the area certified and while this is an increase on the previous year it is still well below its dominant position in ware production where it accounts for over 31% of the area sown.

Since 1992 the number of varieties entered for the certification scheme has declined from 44 to 26 in 2002. This is outlined in Table 78. The Department of Agriculture and Food has no control over the varieties entered, other than basic compliance with National Listing or listing on the EU Common Catalogue. Holders of Plant Breeder's Rights for protected varieties control the production of those varieties. The presentation of a large number of varieties for classification and certification requires a high level of expertise and certification staff must be continuously updated with respect to new varietal characteristics.

Table 78: Number of Varieties classified as certified seed (1992 – 2002)

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Number of Varieties	44	45	38	36	33	48	39	32	36	32	26

Source: DAF

Classification Classes

The following table shows the area classified in the various classes in selected years. Seed of various classes may enter ware production at any stage, without necessarily going through many generations of multiplication in the certification system. In addition imported seed may enter the system at various stages, depending on how it is classified.

Table 79: Area Classified per Class in Selected Years (Hectares)

Classes	**1997**	**1999**	**2000**	**2001**	**2002**
FS1	67	37	14	14	8
FS2	66	136	87	26	61
SE1	279	383	317	211	157
SE2	149	300	262	277	369
SE3	103	272	373	370	342
E	1261	906	673	502	580
H	154	109	27	135	21
Total Certified Seed	**2078**	**2143**	**1754**	**1535**	**1539**

Source: DAF

The above classes are all certified basic seed (white label). In recent years, demand has increased for SE1 and SE2 seed with less demand for SE3, Elite and Class H seed. This has tended to "short-circuit" the seed production system, removing early generation material from the system, before full "bulking up" of stocks has occurred.

Productivity of Scheme

The Seed Potato Certification Service is provided free of charge. A specified out-turn of marketable seed from the classified crop is not a scheme requirement.

The key measure of productivity in the seed certification scheme is the quantity of potatoes certified per unit area, i.e. tonnes per hectare. Seed potatoes can only be offered for sale by a producer when the bag or container has been sealed and labelled by an officer of the Department. Traditionally, there has been a low level of productivity from the seed certification scheme as outlined in Table 80. The data shows that seed and ware crop have co-existed with seed production being a by-product of the ware crop. In view of the increased output per hectare arising from higher yielding varieties, pest controls, etc., certified seed output per hectare has deteriorated over the past 50 years. The more recent yields of certified seed per hectare represent about 25% of the potential output compared to 25 and 29 tonnes per hectare in Scotland and Holland.

Table 80: Productivity of the Seed Certification Scheme 1950-2000

Year	Certified seed area sown (hectares)	Total quantity sealed (tonnes)	Tonnes sealed per hectare
1950	5977	41864	7
1960	6730	61044	9
1970	5180	42643	8
1980	3807	22157	6
1990	2542	21239	8
2000	1781	13270	7

Source: DAF

Table 81 gives a breakdown of tonnage of seed certified by the main varieties in 1992 and 2002. Output in 2002 varies from under 4 tonnes/ha for Kerr's Pink to over 15 tonnes/ha for Rooster. The Table also shows the change in variety usage and productivity over the period under review. In 1992 Kerr's Pink and Record dominated the market in certified seed

making up over half the total disposals, albeit at a low rate of output of 6 tonnes/ha. While Kerr's Pink continued to be the dominant variety in terms of area certified in 2002 it has been overtaken by Rooster in seed output terms. The data in Table 81 shows that certified seed of Kerr's Pink, Record and most of the other *'free'* varieties are grown predominantly as a dual crop with ware dominating. These varieties are grown on a spot mark basis without any contractual arrangement with ware growers. Rooster on the other hand is a '*protected'* variety, subject to Plant Breeders Rights and all certified seed production is carried out under contract to Irish Potato Marketing Co Ltd, the owners of the rights.

Table 81: Output from seed certification scheme 1992-2002 by variety

Variety	Year					
	1992			2002		
	Area Sown	Tonnes Sealed	Ave t/ha	Area Sown	Tonnes Sealed	Ave t/ha
Rooster	70	130	2	216	3397	15.7
Kerr Pinks	841	4765	6	724	2767	3.8
Record	604	4066	7	169	858	5.1
Golden Wonder	52	1149	22	119	642	5.4
British Queen	211	2170	10	101	945	9.3
Other Varieties	1078	12017	11	209	1749	8.3
Total	2852	17383	6	1538	10358	6.7

Source: DAF

The survey data outlined in Table 82 shows the total potato output of seed producers in 2001 was 44,885 tonnes from the 1537 Hectares of seed area certified. This represents an average output of 29 tonnes of potatoes per hectare.

There is wide variation in output between the varieties grown as shown in the 2001 survey data outlined in Table 82. Over 90% of Cara output is used for seed compared to 26% for Kerr's Pink and Record. Seed output from Rooster is over 19 tonnes per hectare which represents some 55% of the total yield from the crop. All the controlled varieties i.e. those subject to Plant Breeders Rights- Rooster, Cara, Lady Rosetta, Saturna have a higher output of seed than the *'free'* varieties – Kerr's Pink, Record, Golden Wonder.

Table 82: Seed and ware output by variety from area sown to Certified Seed in 2001

Variety	Seed Output Tonnes	Ware and other uses Tonnes	Total potato output Tonnes	Output of potatoes per hectare Tonnes	Output of seed tonnes per hectare (% in brackets)
Kerr's Pink	4939	13717	**18656**	27	7 (26)
Rooster	4320	3490	**7810**	34	19 (55)
Cara	1639	91	**1730**	33	31 (95)
British Queen	1522	985	**2507**	24	15 (63)
Record	1353	3759	**5112**	36	9 (26)
Lady Rosetta	1055	813	**1868**	36	20 (56)
Golden Wonder	985	2341	**3326**	29	9 (30)
Saturna	653	242	**874**	32	24 (73)
Others (24)	1150	1831	**2981**	22	9 (39)
Total (32)	**17616**	**27069**	**44685**	**29**	**11 (39)**

Source : An Bord Glas/DAF Survey

2.5.2.5 Resources and Costs

The main expenditure of the Department of Agriculture & Food in the provision of the seed potato certification service relates to salaries and expenses, together with back-up support for analytical services.

Management Staff

Up to (1997) both the seed and ware potato sectors were serviced by the same technical and professional potato inspectorate. In 1997 it was decided to transfer ware potatoes to the Horticulture Inspectorate due mainly to the increase in EU legislation at retail level for fruit and vegetables. Prior to this, retail duties involved about 5% of potato management staff time.

Other changes in management occurred in 1998 when the seed potato and cereal seed certification schemes came under the same inspectorate staff. In 2002 the Agriculture Inspector (AI) in charge of Foundation stock retired and was replaced by an AAI located at the Tops Centre. Foundation seed then came under the Tops management. These changes are summarised in Table 83.

Table 83: Potato Management Staff in Tops and Seed Certification

Duties	Early 1990s			2003	
	Grade	Time spent on Seed Potato Certification Duties		Grade	Time spent on Seed Potato Certification Duties
	SI	*50% of time		SI	10% of time
Tops	AI	100%		AI	100%
Tops	-	-		AAI	100%
Foundation Seed	AI	100%		-	-
Seed Certification	AI	*95%		AI	12%
Seed Certification	AAI	*95%		AAI	25%
Seed Certification	AS	*95%		AS	30%
Equivalent Professional & Supervisory staff		5.35 staff			2.77 staff

Technical Staff

The number of technical staff employed in the seed certification services is outlined in Table 84. For the purpose of comparisons between the years under review this Table also includes technical staff responsible for the certification of Foundation stock. The total number of technical staff has fallen from 32 in 1992 to 26 in 2002. However, approximately 3 TAO equivalents are transferred to other duties on a part time basis bringing the total number of technical staff operating the scheme to 23 in 2002.

Table 84: Technical Staff Levels* 1992 to 2002

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
District Superintendents (DS)	4	4	3	5	6	6	6	6	6	6	6
Technical Agriculture Officers (TAO)	28	28	28	28	24	24	21	20	21	20	20
Sub-total	32	32	31	33	30	30	27	26	27	26	26
Equivalents (MWUs) transferred to other duties (TAOs)	-	-	-	-	0.5	0.5	1	2	2.5	4.8	3
Net Operational Staff	**32**	**32**	**31**	**33**	**29.5**	**29.5**	**26**	**24**	**24.5**	**21.2**	**23**

*includes Foundation Stock Inspectors

The adjusted number of TAOs in Man Work Units involved in the scheme is shown diagramatically in Diagram 10. As the area of seed entered for certification has declined, technical staff numbers have declined – largely through retirements and temporary transfers out of the group.

Diagram 10: TAO staff levels (adjusted to MWU) in Seed Certification

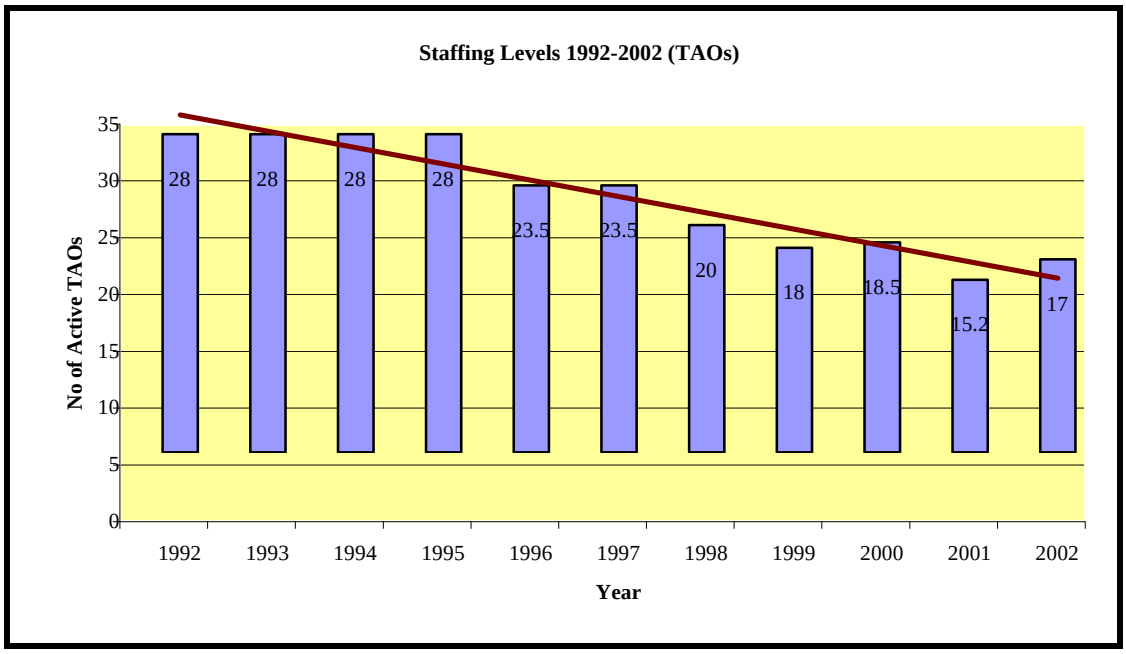


Table 85 provide a distribution of seed potato certification staff on a regional basis over the period of the review. These regions correspond to operational District Superintendent areas. The northern region (Donegal) is serviced by two District Superintendents. The foundation stock staff are also based in Donegal, but operate on a nationwide basis. The staff in Donegal also have responsibility for pre- and post-control plots. This involves half of one DS' time and two TAOs. In addition, one TAO is on long-term transfer to ERAD, but available for crop inspection duties. Staff from this region also assist in certification duties in other areas of the country, as well as being temporarily transferred to other duties such as biosecurity, from time to time.

Table 85: Regional Breakdown of Technical Staff 1992 -2002

	Donegal	South	Northeast	West	Total		Adjusted Total *
					DS	TAO	
1992	21	4	4	3	4	28	32
1993	21	4	4	3	4	28	32
1994	20	4	4	3	3	28	31
1995	21	4	4	4	5	28	33
1996	18	5	4	3	6	24	29.5
1997	18	5	4	3	6	24	29.5
1998	16	5	3	3	6	21	26
1999	16	4	3	3	6	20	24
2000	15	5	4	3	6	21	24.5
2001	15	4	4	3	6	20	21.2
2002	15	4	4	3	6	20	23

* Adjusted total – excluding temporary transfers out of the group. Includes Foundation Seed technical staff.

All 19 current TAO staff assigned to general certification are retained during inspection periods. Historically, the allocation of staff took into account the geographical concentration and spread of seed growers and production area. Some staff from the North and West assist with inspections in the East.
The staff in Donegal comprise of three DSs and 12 TAOs. One DS and one TAO are assigned to Foundation Seed, while two full-time TAO equivalents are assigned to Post-Control work.

Costs

The staff costs of operating the seed certification services are outlined below in Table 86. The total staff costs which include salaries, travel and subsistence and accommodation amounted to €2.32m of which €1.163m or 50% related to the provision of the seed certification services.

Table 86: Staff costs of seed certification services as % of total costs in 2002

Location	No Staff	Total staff Costs	Staff costs of seed certification services	Seed certification costs as % of total staff costs
Donegal N	1 DS 6 TAO	438,932	254,039	58%
Donegal S	1 DS 5 TAO	284,068	210,438	74%
South	1 DS 3 TAO	262,712	164,538	63%
East	1 DS 3 TAO	188,435	177,067	94%
West	1 DS 2 TAO	166,593	123,287	74%
Foundation Stock	1 DS 1 TAO	109,407	84,860	78%
Total Technical Staff	**6 DS 20 TAO**	**1,450,147**	**1,014,230**	**70%**
Total Inspectorate Staff, Backweston	**1SI, 1AI, 1AAI, 1AS**	**561,039**	**108,000**	**19%**
Total Administrative Staff, Maynooth	**1 PO, 1AP, 1HEO, 1EO, 1CO**	**308,761**	**40,686**	**13%**
Total staff Costs		**2,319,947**	**1,162,916**	**50%**

A breakdown between the time and associated staffing costs for the 11 different functions carried out by seed certification staff is presented in Table 87. The proportion of time spent on each function is based on technical staff work output outlined in Table 88.

Table 87: Estimate of technical staff costs associated with the various functions of the Seed Certification Services

Ref	Function	Time	Staff Costs
1.	EC Seed Potatoes Regulations 1980 - 1999	56.9%	€577097
2.	Growers and Packers Act 1984 – 2001	3.1%	31441
3.	Potato Root Eelworm Order 1945	19.0%	192704
4.	Black Scab (Special Area) Order 1933 - 1948	0.4%	4057
5.	Food Standards (Potatoes) Regulations 1977 - 1996	1.3%	13185
6.	Ring Rot / Brown Rot Regulations and Directives	4.4%	44626
7.	Colorado Beetle Order 1945 – 1962	0.4%	4057
8.	Imported Seed (Potatoes) Order 1981	0.9%	9128
9.	Plant Varieties (Property Rights) Regulations 1981	0.4%	€4,057
10.	Plant Health Directive 2000/29EC	0.4%	€4,057
11	.Non statutory services	12.8%	129821
	Total	**100%**	**€1,014,230**

Table 88: Calculation of Technical officers time spent at each of the functions in the Seed Certification services

Reference Number	1	2	3	4	5	6	7	8	9	10	11	Total
Days	107	5	36	1	3	8	1	1	2	1	24	189
Administration	22	2	7			2					5	38
Total time in days	**129**	**7**	**43**	**1**	**3**	**10**	**1**	**1**	**2**	**1**	**29**	**227**
% time	56.9	3.1	19.0	0.4	1.3	4.4	0.4	0.4	0.9	0.4	12.8	100.0

These figures based on a 'Benchmark' district and work time % used to divide up national service costs

The operational costs of the seed certification services for 2002 are outlined in Table 89.

Table 89: Operational Costs of the Seed Certification Services

Details	Costs
PCN Soil Sample Analysis	157,300
Carriage of samples	3,299
Post Control Plots (production Costs)	934
Labels	5,485
Protective Clothing, equipment, etc	22,634
Total	**189,652**

The analysis (and carriage) of soil samples for Potato Cyst Nematode cost €160,599 in 2002 or 85% of the total operational costs. The total number of samples analysed was 8093 at a cost of €19.80 per sample. A breakdown of the samples tested for PCN over the period of the review is given in Table 90. All sampling and analysis is carried out free of charge.

Table 90: PCN samples analysed 1992 -2002

Year	No Samples analysed for Seed potatoes	No samples analysed for ware potatoes	Total number of samples analysed
1992	9985	2728	12713
1994	9121	3203	12324
1996	10666	1943	12609
1998	7907	1699	9606
2000	7547	1416	8963
2002	6314	1779	8093

The average number of samples analysed per hectare of classified seed area in 1992 was 3.5 compared to 4.1 in 2002, i.e. an increase of 17% in the sampling intensity. With the introduction of Class X in 2002 there was an increase in the number of soil samples from the ware crop analysed.

Other Costs

These include the ELISA testing for viruses at the Tops centre and the testing for Ring Rot and Brown Rot in the State Laboratory. These costs are included elsewhere in the report.

2.5.2.6 Evaluation of Seed Certification Services

Examination of the outputs from the Seed Certification Scheme in the context of the changes in the sector between 1992-2002 and consideration of alternative means of achieving the objectives or ceasing the activities

The main outputs of the seed certification service are examined under the following headings:

(i) Seed Certification Scheme
(ii) Plant Health controls
(iii) Registration and Standards
(iv) Market information/surveys

A breakdown of the time allocated to each of these areas in 2002 was as follows	
EC Seed Potatoes Regulations	**56.9%**
Plant Health Controls	**25.5%**
Registration and Standards	**4.4%**
Market Information etc	**13.2%**

(i) Seed Certification Scheme

Apart from a reduction in staff numbers there has been no significant change in the operation of the seed certification scheme over the period of the review. The only major change was the introduction of 'Class X' in 2002 to regulate the use of home grown seed and thereby meet the requirements of the High Grade Seed Area.

Over the period the area certified has fallen by 46% and the quantity sealed under the certification scheme by 40% (Table 91). The export market has greatly declined while import penetration of the Irish market continues to grow.

Table 91: Summary of main changes in seed potato sector 1992-2002

Year	Potato area sown (Ha)	Area certified (Ha)	Tonnes sealed	Seed exports (Tonnes)	Seed imports (Tonnes)
1992	16519	2852	17383	6099	9184
2002	13172	1539	10385	384	15567 (CSO) 6000 Est (DAF)

In terms of productivity, output from the scheme is low by international standards. This has been a historical aspect of the seed certification in Ireland. Certified seed output has never exceeded 10 tonnes per hectare since the scheme commenced in the 50's and in the 70's and 80's was as low as 6 tonnes per hectare. Over the past decade average seed output has been around 7 tonnes per hectare with the average in 2002 at 6.7 tonnes. (If the quantity passported[16] is added, output per hectare was 10.1 tonnes in 2002). Output is considerably lower than in Scotland or The Netherlands which have outputs of 25 and 27 tonnes per hectare, respectively. In Northern Ireland output of certified seed per hectare is about 12 tonnes per hectare. There is considerable variation in certified output between varieties with, for example, the '*protected*' variety Rooster having approximately 15 tonnes per hectare compared to 4 tonnes for the '*free*' variety, Kerr's Pink.

[16] Following a FVO audit it is now obligatory to passport seed for home use. This totalled 5230 tonnes in 2002. In previous years seed was also retained for home use but the quantity was not recorded. It would be expected that there would be a pro rata retention in these years compared with 2002.

At Scottish productivity levels, the total certified seed output from the Irish scheme could be achieved from a little over 400 hectares, a quarter of the current area. Indeed all of the 2767 tonnes of Kerr's Pink which was certified in 2002 could be produced from 110 hectares rather than the 724 hectares used if the level of efficiency was similar to Scotland. The other free varieties like Record, and Golden Wonder have similar low productivity levels. Producers of these free varieties combine seed and ware in the one crop and bulk up the seed crop to achieve maximum weight. In the absence of any contract for their seed, growers of the free varieties have little choice other than this approach in order to protect their income and investments. In this regard, the absence of an adequate price differential for the grower to produce mainly seed is an important factor.

It should also be noted that a high quantity of the seed produced on Irish farms is retained for growing the following years ware crop and does not go through the certification/labelling process. The DAF/Bord Glas survey shows the quantity of such seed in 2002 exceeded 7000 tonnes. Under the Class X requirements which became mandatory for the 2002 growing season, almost 10,000 tonnes of farm saved seed was approved for retention and planting in 2003. The concentration of Class X in the main ware producing areas in the North East indicates that home saved seed contributes a very high proportion of the seed required for the ware crop in these areas. Much of the certified seed used for Class X comes from early generation seed and, accordingly, such seed is of high status even though its inspection is not quite as rigorous as that for certified seed.

Output of staff

In 1992 there were 4 District Superintendents supervising 28 TAOs, a ratio of 1:4 and in 2002 there were 6 DS for 20 TAOs, a ratio of 1:3.3. All the field inspections, sampling, etc., is carried out by the TAOs.

The average area certified by each TAO has fallen from 101 hectares in 1992 to 77 hectares in 2002. However, when TAO numbers are adjusted to take account of work performed in non-potato activities in the Department, the area certified has fallen from 101 hectares to 90 hectares over the period. Furthermore, if account is taken of Class X , the area certified in 2002 was 157 hectares per TAO (adjusted).

The average quantity of seed certified (labelled and sealed) per TAO has fallen from 620 tonnes in 1992 to 518 tonnes in 2002. However, when the 2002 TAO numbers are adjusted to take into account work carried out on non-potato duties, the tonnes sealed per officer are much similar at 621 tonnes in 1992 and 592 tonnes in 2002. The inclusion of Class X and passported seed in 2002 would bring the total quantity of seed inspected to 25,480 tonnes which works out at 1456 tonnes per TAO (adjusted).

While the quantities of seed retained for home use (Class X and passported) contribute substantially to the potato industry, the key criteria in determining the changes taking place in the certified seed potato sector is the area of land classified to grow seed potatoes and the quantity of potatoes which are labelled and sealed from that area. These latter figures are also important for comparisons with the seed certification scheme in other jurisdictions.

Inspection figures for Northern Ireland show that the average area classified per inspector (13 inspectors and 2 senior inspectors) in 2002 was 72 hectares and the average tonnage sealed per inspector was 855 tonnes. Scottish figures are estimated at about 200 hectares of classified area and 5,000 tonnes of certified seed. In the 80's the standard rule of thumb for assigning technical officers to the seed certification scheme was 400 acres or 160 Ha per TAO.

Table 92: Technical staff output Seed Certification Scheme 1992-2002

Year	Area Certified[17] (Ha)	Tonnes sealed	No* TAOs	Area* certified per officer	Tonnes* sealed per officer
1992	2852	17383	28 (28)	102	621
1996	3003	19853	24 (23.5)	128	845
2000	1781	13270	21 (18.5)	96	717
2002	1537	10358	20 (17.5)	90	592
2002 incl Class X	2671**	NA	20 (17..5)	157	NA

*adjusted in brackets

** Class X area of 1132 hectares.

There is considerable variation in output between the different regions in the country and accordingly the cost of certifying the crop varies widely (Table 93).

Table 93: Breakdown of area certified and tonnes sealed under the seed certification scheme in 2002 by region and by technical staff numbers employed

Region	No technical staff		No certified seed growers		Area (Ha)		Tonnes Sealed	
	Total	Adjusted	Tota l No	Average per officer	Total	Average Per officer	Total	Ave per officer
North	15	13	114	8	636	42	5120	341
South	4	3.4	76	19	349	87	1898	475
East	4	4	30	8	389	97	2693	673
West	3	2.6	42	14	163	54	647	215
	26	23	262	10	1537	59	10358	398

Costs of Seed Certification

The total costs of the seed certification service in 2002 was €1,352,568. This represents an average cost of €5160 per grower, €130 per tonne of seed certified or €898 per hectare of land used for growing the certified crop. By including the Tops facility which is an inherent element of the certification programme total costs rise to over €2m. Under this latter scenario the average cost to the state of producing and certifying seed potatoes is €190 per tonne or €1300 per hectare. A breakdown of the staff and operational costs per hectare of certified seed is given in Table 94.

[17] Of the total area entered for the scheme the average area rejected for certification over the period was 16%. In 2002, 1652 hectares was entered for the certification scheme of which 1537 hectares was certified. In relation to Class X 1399 hectares were entered and 1132 hectares authorised.

Table 94: Costs of the seed certification scheme

Cost Category	Costs	Cost per hectare certified
Salaries/expenses/office		
• Professional/Technical	1,122,230	729
• Administrative	40,686	30
Sub Total	1,162,916	759
Operational	189,652	139
Total	**1,352,568**	**898**

Staff Costs

Technical staff costs are the major cost in the operation of the seed certification scheme. A breakdown of these costs between the core activities in the seed certification services and other potato duties is outlined in Table 87. Other non-potato duties (ERAD, biosecurity etc) account for over 30% of the costs of the 26 staff employed in the seed certification scheme. The costs of these non –potato activities is examined further in Table 95

Table 95: Breakdown of Technical Staff Costs between Potato schemes and other activities

Detail	All activities (Seed Certification and non-potato activities)	Seed Certification services only	Non-potato activities
Salaries	890,617	800,941	89,676
Office Allowance	17,034	17,034	-
Travel and Subsistence	339,627	196,255	143,372
Overtime	202,869	0	202869
Total	**1,450,147**	**1,014,230**	**435,917**

*This figure is calculated taking each salary and multiplying it by the percentage of time worked on seed cert. duties. It is not possible mathematically to take the figure -(€890,617 and multiply it by (23.16 / 26)) because each individual salary is numerically different.

Certification costs between regions

There is major variation in the costs of the seed certification activities between the regions. An examination of the technical staff costs is presented in Table 96. The average cost per tonne of certified seed (labelled and sealed) in 2002 was €97, ranging from €65 in the east to €190 in the west. The average cost per hectare of certified seed was €659, ranging from €455 in the east to €756 in the west. When Class X is added average costs per hectare fall by 42% to €380 per hectare (ranges from €167 to €594). However Class X inspections are less intensive than certified seed, accounting for about a third of that required for the certified crop. In addition, as outlined in Table 73, a third of the Class X area is farmed by certified seed growers and the inspection of the Class X crops in these cases can be carried out in conjunction with the certified seed crop.

Table 96: Certification costs by Region in 2002 (TAO and DS grades)

Region	Salaries, office and expenses of Technical Staff	Cost per tonne certified seed sealed	Cost per Hectare of certified seed	Cost per hectare of certified seed and Class X
Donegal	464,477	90	730	594
South	164,538	86	471	272
East	177067	65	455	167
West	123,287	190	756	536
Foundation Stock	84860	-		
Total	1,014,230	98	659	380

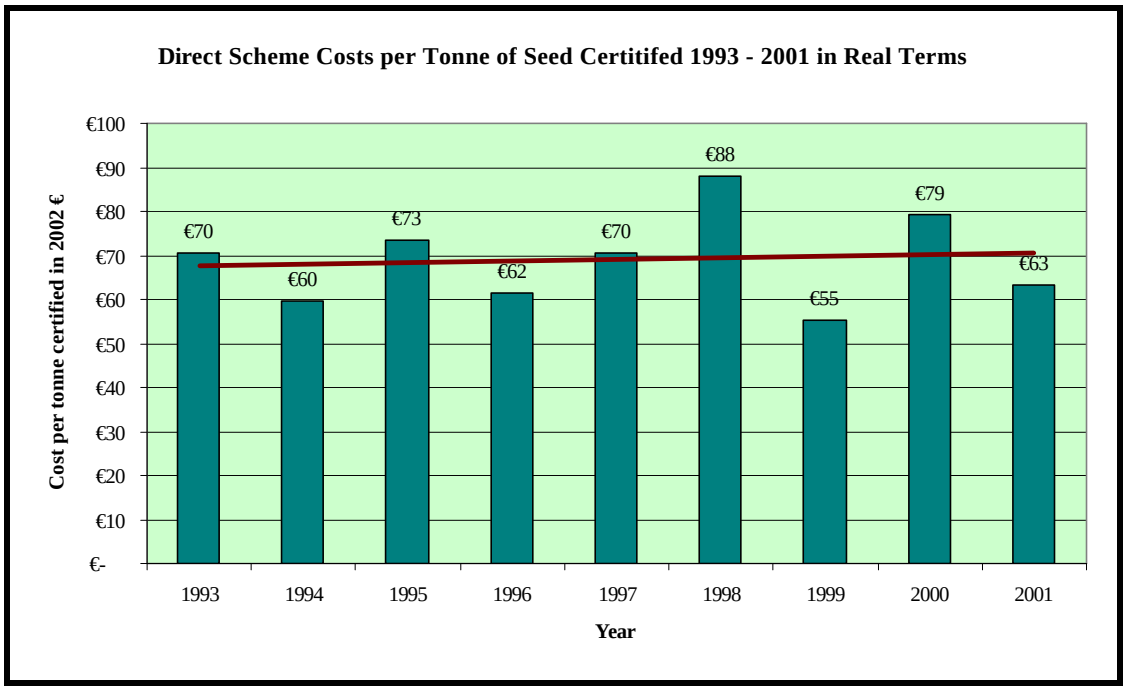
An analysis of the costs of the scheme adjusted for inflation (Table 97 and Fig 7) shows that the average cost of inspection per hectare has risen from €388 per hectare to €508 in 2001 a cost increase of 31 % over the period of the review. The cost per tonne of seed certified over the same time shows that the costs peaked in 1998 and then declined before rising again in 2002.

Table 97: Comparison of output per TAO and Direct scheme costs 1992-2002

Crop Year	Area Inspected (ha)	Quantity Certified (t)	No of TAOs (net) [a]	Unit Area per TAO (ha)	Quantity Certified Per TAO (t)	Direct Scheme Cost Actual € [b]	Direct Scheme Cost in 2002 € [c] (Adjusted for inflation)	Cost per ha Inspected in 2002 € (Adjusted for inflation)	Cost per t Certified in 2002 € (Adjusted for inflation)
1992	3,512	17,383	28	125	621	n/a	n/a	N/a	n/a
1993	3,257	17,946	28	116	641	968,447	1,263,642	388	70
1994	3,175	20,554	28	113	734	961,035	1,224,581	386	60
1995	3,499	18,129	28	125	647	1,069,072	1,329,020	380	73
1996	3,678	19,853	23.5	157	845	998,381	1,221,595	332	62
1997	2,698	17,608	23.5	115	749	1,029,014	1,240,469	460	70
1998	2,521	12,710	20	126	636	948,754	1,116,911	443	88
1999	2,480	18,444	18	138	1025	882,400	1,022,437	412	55
2000	2,057	13,270	18.5	111	717	958,896	1,052,152	511	79
2001	1,746	14,040	15.2	115	924	848,374	887,399	508	63
2002[d]	3051	na	17	179	609	€1,044,316	€1,044,316	342	NA

[a.] Active TAOs excluding staff on temporary assignment out of the Division
[b.] Salaries & Travel & Subsistence expenses only for TAO's
[c.] Costs for 1993 to 2001 adjusted for inflation to 2002 Euro prices using CSO Consumer Price Index
d. Re 2002- area inspected (3,051.) This comprised (1,652) certified seed and 1,399 Class X seed.

Diagram 11: Costs of seed certification scheme 1993-2001



Comparisons between 1992 and 2001/2002 should be considered in the context of two events, firstly, in 2001 the outbreak of Foot and Mouth Disease required the temporary transfer of 4.8 TAO staff equivalents to veterinary/food safety activities and, secondly, in 2002 in addition to the temporary transfer of 2.84 TAO equivalents to other duties Class X was introduced into the seed certification workload. Accordingly, there was an increase in output per officer which in turn impacted on unit costs.

While the average costs in real terms per tonne of potatoes certified has been relatively constant over the period, these costs are nevertheless at a level which would prove prohibitive for growers in a charging for services situation where full costs could have to be recovered.

Cost of Other Duties

Because of an imbalance in the workload between regions some technical officers are transferred from Donegal to the eastern region to carry out seed certification duties during peak periods. In addition, staff are temporarily transferred to other Department schemes or carry out these duties on overtime. A breakdown of the staff costs for potato duties and non-potato duties such as biosecurity, etc., is presented in Table 98.

The payments made to the 26 technical staff invoved in the certification scheme in 2002 was €1,450,147. Some €1.014m was attributable to potato duties with the balance of €435,917 attributable to non-potato duties. Non-potato duties represent 29% of the total payments made.

Eight of the 20 TAOs worked on non-potato schemes for 35.5% of their normal time in 2002. This represents 2.84 Man Work Units (MWU). The cost of salaries, overtime and travelling and subsistence associated with these non potato duties was €435,917 or €153,492 per MWU. This is over three times the cost associated with

normal core potato duties and accordingly, is an expensive deployment of resources. It should also be noted that there was no overtime paid to staff for potato duties which would indicate adequate staffing levels, at least.

Table 98: Breakdown of Technical Staff costs by region for potato duties and other duties (biosecurity etc)

District	No staff	Total Costs of Staff	Costs attribut-able to Potatoes	Costs of other duties				Costs of a TAO (MWU) for other duties
				T&S	O/T	Salary/ other	Total	
Donegal North DS 1	**1 DS** **6 TAO** **(5.02 TAO Adj)**	**424,949**	**254,039**	**53545**	**15,553**	**101812**	**170,910**	174,396
Donegal South DS2	**1 Ds** **5TAO** **(3.97 TAO Adj)**	**282,454**	**210438**	**15,553**	**17366**	**39097**	**72,016**	69,917
South DS3	**1 DS** **3 TAO** **(2.41 TAO Adj)**	**262,710**	**164,538**	**32366**	47182	18624	**98,172**	166,393
East DS4	**1 DS** **3 TAO**	**188433**	**177,067**	**6204**	5162	0	**11,366**	---
West DS5	**1 DS** **2 TAO** **(1.76TAO Adj)**	**165938**	**123,287**	**17829**	**17831**	**6991**	**42,651**	177,712
Foundation Seed	**1 DS** **1TAO**	**109,406**	**84860**	**14028**	**10518**	0	**24,546**	---
Total	**6 DS** **20 TAO** **(17.16 TAO Adj)**	**1433890**	**1014229**	**139525**	**113612**	**166 524**	**419661**	153,492

Years of Service

The technical staff in the certification service have many years experience with almost half over 60 years of age. By 2008, a minimum of eight staff will retire on age grounds and up to 14 will have 40 years service completed. The age profile is outlined in Table 99.

Table 99: Age Profile of Staff

Forty Years' Service		Mandatory Retirement (65 Years)		
Analysis	**Cumulative**	**Analysis**	**Cumulative**	**% of Group**
1-Forty Years-2002	1	**1 in 2005**	**1**	**4%**
1-Forty Years-2003	2	**3 in 2006**	**4**	**17%**
9-Forty Years-2004	11	**4 in 2008**	**8**	**33%**
3-Forty Years-2005	14	**6 in 2009**	**14**	**58%**
7-Forty Years-2009	21	**1 in 2010**	**15**	**63%**
1-Forty Years-2010	22	**1 in 2011**	**16**	**67%**
1-Forty Years-2011	23	**2 in 2012**	**18**	**75%**
1-Forty Years-2012	24	**4 in 2013**	**22**	**85%**
1-Forty Years-2015	25	**2 in 2016**	**24**	**92%**
1-Forty Years-2018	26	**1 in 2019**	**25**	**96%**
		1 in 2022	**26**	**100%**

The age profile varies between the regions as indicated in Table 100 with Donegal staff having the oldest staff members.

Table 100: Regional breakdown of Staff Service

Region	**No staff**	**Staff with current no years service**						
		Less than 35 years	**35**	**36**	**37**	**38**	**39**	**40 and over**
North	13 *	4 *				2	7	
South	4	2					2	
East	4	3				1		
West	3	1						2
Total	24	10				3	9	2

* Includes part time - seasonal worker on seed certification, on loan to another area for remainder of year

Field inspection which involves walking each crop is a relatively physically demanding activity and becomes more demanding when crops are mature and weather conditions unfavourable. For staff with many years service, this becomes an additional consideration in determining workload and output.

Operational Costs

The non-staff costs of the seed certification service in 2002 amounted to €189, 652. A breakdown of these costs is provided in Table 85. Teagasc was paid €160,599, representing

83% of the total, to carry out the analyses of the soil samples for Potato Cyst Nematode (PCN). The carriage of the samples to the Teagasc centre in Kinsealy amounted to €3,299

(ii) Plant Health Controls

The work of Seed Certification staff involved in plant health issues relate to the maintenance of the High Grade Seed Area for the country through the prevention and control of a range of diseases and pests.

High Grade Seed Area

Ireland, Scotland, Northern England (Cumbria and Northumberland), parts of Germany, Parts of Finland and the Azores have been granted High Grade Seed Area (HGSA) status by the EU in respect of seed potatoes. This allows these regions to restrict seed potato marketing to higher grades, i.e. EC1, EC2 and EC3. In the Irish Classification system these are Foundation Stock 1 and 2, Super Elite 1,2 and 3, Elite, and Class H. The purpose of the High Grade Seed Area provision is to prevent the entry and spread of harmful pests and diseases into the country by the planting of inferior seed and seed from these areas becomes more acceptable. Sometimes importers specify sourcing from HGSAs.

The Department of Agriculture and Food introduced measures in Spring 2002 whereby from 2003 onwards only certified basic seed or the direct progeny thereof could be planted. Ware growers who wish to retain farm saved seed potatoes for planting from the 2003 crop must have the crops inspected and classified. These crops must be planted with certified basic seed and meet such requirements as varietal purity and health. Soils of all such crops must also be tested for the absence of PCN. Crops which meet the minimum requirements are given a classification called *Class X*. Class X is not certified seed and cannot be marketed.

The benefits to the potato sector arising from the introduction of Class X include:

- Retention of High Grade Seed Area status
- Potential reduction in national disease reservoir and spread
- Improved traceability for the ware crop
- Improved tuber standards and market acceptability
- Improved productivity of national crop

The Class X area entered and classified in 2002 is outlined in Table 75. The addition of Class X increased the area entered for certification by 85% with Meath, Dublin and Louth accounting for over half of the 1399 hectares classified as already outlined.

The introduction of Class X seed, has led to a reduction in the per hectare inspection costs. Approximately 1/3 of Class X crops are on farms already in the seed Certification scheme, and the remainder are in areas already being serviced. In addition Class X seed is less intensely inspected when compared to other certified crops, with two rather than the normal five field visits for the latter. The additional workload arising from Class X equates to about 30% of that of certified seed, on a per hectare basis.

The introduction of Class X in 2002 has arrested the fall off in workload and the average cost per unit area 'approved' for growing seed potatoes.

PCN and other Diseases

A breakdown of the technical staff costs associated with plant health under the seed potato certification services are presented in Table 87. The total costs amounted to €258,629 involving 25.5% of the workload of seed certification staff. These costs are broken down as follows:

Potato Root Eelworm(PCN)	€192,704
Black Scab	4,057

Ring Rot/Brown Rot	44,626
Plant Health Directive	4,057
Imported Seed Potatoes Order	9,128
Colorado Beetle Order	4,057
Total	**258,629**

Staff costs associated with Potato Root Eelworm (PCN) are the highest at €192,704 with additional €160,000 for testing the samples bringing the total costs of PCN to €353,000. Additional costs for PCN have arisen with the introduction of Class X as the land on which it is grown must also be free of eelworm. The sampling is carried out pre-crop and on a less intensive basis than for certified seed. This service as in the case of PCN testing under the seed certification scheme is provided free of charge by the Department of Agriculture and Food.

In 2002 the total number of PCN samples taken was 8093 of which 6314 samples were for seed crops and 1779 samples for ware crops. Ware or Class X sampling now make up 22% of total PCN sampling.

With the exception of potatoes, the Plant Health Division of the Department is responsible for all the plant health regulations inside and outside the farm gate. In the case of potatoes, the seed potato inspectors are responsible for activities at farm level with the staff of Plant Health Division responsible for ware potato controls outside the farm-gate and Seed Certification Division responsible for seed outside the farm.

(iii) Registration and Standards

As outlined in Table 87, Seed Certification staff spend 4.4% of their time enforcing the Growers and Packers Act 1984 (1985, 2001) and the Food Standards Potato Regulations (1977) at a cost of €44,626. The seed potato inspectorate are responsible for implementing this legislation on farms while the inspectorate of the Horticulture and Plant Health Division are responsible for enforcing compliance in wholesale and retail premises.

The Growers and Packers Act 1984 applies to the sale of potatoes and requires all growers and packers to be registered with the Department, have their registration number on the label/bag and maintain records to provide traceability. The Act was amended in 2001 to provide additional information on seed potatoes acquired for planting. Seed potato inspectors spend 3.1% of their time enforcing this regulation at farm level at a cost of €31,441. Inspection costs incurred by Horticulture Division in the enforcement of the Growers and Packers Act and the Food Standards (Potato) Regulations in wholesale and retail premises amounted to €158,506.

The Food Standards (Potatoes) Regulations set down quality standards for ware potatoes for consumption. The seed potato inspectorate carried out 1399 inspections of 28,200 tonnes of ware potatoes in 2002. These were in addition to those of the Horticultural Inspectorate who carried out 808 wholesale inspections and 1610 retail inspections in 2002 (see Table 26).

(iv) Market information/surveys and other duties

Seed certification staff are also involved in non-statutory duties which have been estimated to take up 12.8% of the workload of the staff at a cost of €145,965 or €6,381 per technical officer. These duties relate to the provision of market information, the annual An Bord Glas Survey, potato blight reports, industry meetings and field days and other activities. The Horticulture and Plant Health Division also provides market information in conjunction with Crop Production and Safety Division, the latter which is also responsible for maintaining a grower database as required under the Growers and Packers Act 1984.

2.5.2.7 Changes/Alternatives to the current Seed Certification Services

The European Communities (Seed Potatoes) Regulations 1980, as amended, require the Minister to establish a Seed Potato Certification scheme. The Minister may appoint a body other than the Department of Agriculture and Food as the certifying Authority. In Northern Ireland and Scotland the Ministry of Agriculture is the responsible authority. In The Netherlands an interprofessional body – NAK – comprised of breeders, wholesalers, producers and users of seed is responsible for administering the seed certification service under the supervision of the Ministry of Agriculture.

The Netherlands

The inspection and sealing is undertaken by a team of specialised potato inspectors located at four regional centres. Each inspector has approximately 400-500 hectares of potatoes to inspect in addition to the sealing and labelling duties for the ensuing 10,000 – 13000 tonnes of seed. The basic seed classes are inspected at least three times and the certified seed classes are subjected to two inspections. Obligatory top kills are specified by NAK during the growing season in order to combat virus diseases spread by aphids. The NAK is totally funded by fees and levies it raises for inspection and certification and for services to be provided to the Dutch potato industry. Fees are charged for field inspection, certification, a gangrene test and post-harvest control. The bulk of seed potato production is undertaken on contract for the major seed companies. Most of the varieties produced are protected by plant breeder's rights.

Scotland

Most seed potato production in Scotland is grown on contract for either seed companies with protected varieties or ware /processing buyers for the UK market. There is a small trade in the open 'spot market' selling of some of the free varieties.

The Scottish Executive Rural Affairs Department, is responsible for the seed certification services. There are about 100 certification inspectors many of which are part-time, employed only for the summer field inspection period. Each officer inspects about 150 hectares.

Certification is subject to a scale of charges which are assessed to reflect full cost recovery for the service. Currently the charges for certification are €82 per hectare and €4.25 per tonne for sealing and labelling. In 2002, 12,978 hectares were inspected and 288,604 tonnes sealed and labelled

Northern Ireland

The Department of Agriculture and Rural Development (DARD) in Northern Ireland is responsible for the seed certification services. The total certified seed area in 2002 was 1080 hectares and the quantity sealed/labelled was 12,838 tonnes. The total number of potato inspectors employed is 15 (13 inspectors and 2 senior inspectors) who also carry out other duties in addition to seed certification. These duties involve cereal seed certification, Quality Assured Cereal inspections and plant health controls. The plant health controls include PCN and Wart disease sampling and inspections, inspections of ware growers and potato processors, surveys for RingRot/Brown Rot, rhizomania surveys and bee varroa surveys. The amount of time spent on seed potato inspections is less than 50% for the 15 technical staff involved. DARD does not operate a plant inspection service (Class X) for ware growers under the High Grade Seed Area measure but randomly audits the records of 20% of ware growers to establish their seed sources.

Under the seed certification scheme, fees are charged at a rate of €47 per hectare for field inspection and €4.83 for tuber inspection. A sealing/labelling fee of €0.65 per tonne is charged for 50kg bags and €1.30 per tonne for one tonne containers. The charges are based

on full cost recovery for the scheme. Administration of the scheme is centralised in DARD headquarters.

Ireland

All seed certification services in Ireland are provided free of charge. Applications for entry to the certification scheme are made directly to the local potato inspector. All potato inspectors (technical staff) work from home.

A summary of the certification schemes operating in each of the countries above is given in the following Table 101.

Table 101 Operation of Seed Certification Scheme in Ireland, NI and Scotland

Factor	Rep Of Ireland	Northern Ireland	Scotland
Applications	Direct to technical staff	To central administration	To central administration
PCN Sampling Fees	None	None	None
Crop inspection fees	None	€47/hectare	€82/hectare
Tuber inspection	None	€4.83	None
Sealing and Labelling fees	None	€0.65/tonne-50kg bags €1.30/tonne- one tonne containers	€4.25/tonne
Area classified	1537 hectares	1080 hectares	12978 hectares
Quantity sealed/labelled	10,358 tonne	12838 tonnes	288,604 tonnes

Developments in Northern Ireland and Great Britain

Northern Ireland

In June 2003, the Department of Agriculture and Rural Development (DARD) announced the establishment of a Seed Potato Liaison Group to act as an advisory body on behalf of seed potato growers and merchants. The setting up of the group followed a review of the seed potato sector which was commissioned by DARD in 2001 against a background of continuing decline in the industry. Seed potato interests were formerly represented by a private company, Seed Potato Promotions Ltd, which was established in 1982 and which ceased to trade in June 2002. The company was facilitated by a statutory levy collected from growers and merchants to enable it to:

- Grow and produce stocks, or encourage the growing and production of stocks, of seed potatoes which have a high degree of freedom from disease
- Increase publicity relating to the seed potato industry
- Conduct, or assist the conduct of, research and development work of an experimental nature in connection with the seed potato industry
- Survey and develop markets for seed potatoes

The new Seed Potato Liaison Group will determine how these objectives may be pursued and how the levy may be used to benefit the industry.

The current rates of levy are €7.10 (£5) per half hectare of certified seed potatoes and €1.28 (£0.90) per tonne of certified seed potatoes for export. These rates have been in effect since 1990.

DARD introduced new requirements for seed potatoes in 2001 as an amendment to the Plant Health Order (Northern Ireland) 1993 whereby only basic seed or home-saved seed, grown once from a crop planted with basic seed, can be planted. The legislation is enforced by Quality Assurance Inspectors from DARD who visit and check a number of potato growers, selected at random, during the growing season. Growers have to make available for inspection labels which they have retained, sealing documents and invoices. (This scheme was introduced by DAF in 2002 as Class X)

Great Britain

The British Potato Council (BPC) which was formed in 1997 has overall responsibility for the development of the Great Britain potato industry. Prior to its formation there were two bodies which represented the interests of the industry.

The Potato Marketing Board (PMB) was a producers' organisation which covered the whole of Great Britain and provided a broad range of services most of which were directed at the table potato grower and market. The PMB was funded by levies on the area of potatoes grown, and its principle activity until the early 90's was the administration of the Potato Marketing Scheme whose role was to control the areas planted. With the removal of the area quota restrictions on potato planting, the PMB focused more on other functions such as promotion, information services, and some research and extension services.

The Scottish Seed Potato Development Council was established in 1982 to act as a central body for the Scottish seed potato industry. This inter-professional body, which had both grower and trader representation, had the power to collect levies from all seed producers and to provide a range of services for the sector. The main activity was the promotion of Scottish seed potatoes in England and Wales and overseas markets.

Both of these organisations were wound up on 30 June 1997 and replaced by the British Potato Council. The BPC's main activities are:

- Promoting, undertaking and funding research and development;
- Advertising and promoting potatoes to consumers both in the UK and export market;
- Collection and dissemination of market information and statistics.

The above activities apply equally across the whole potato sector. With regard to the seed potato sector a detailed review was carried out in 1998 by the BPC. This included a review of the domestic seed sector structure, the seed export market and examination of competitive organisations. Following a round of consultations with key stakeholders in the seed sector the following three main objectives were derived:

- Increasing the market share of classified and certified seed from 71% to 80% by 2003;
- Maintaining or increasing the level of 92% self sufficiency in seed measured as 5 year averages;
- Increasing the volume of seed exported by 50% by 2003 from a five year average of 44,000 tonnes/year to 66,000 tonnes/year

An initial screening of markets was carried out in 1998 by BPC staff. This involved examination of markets according to features such as size of market, potential customers

and demand, transport costs, scope for recognition of plant breeders rights, political factors, import restrictions, plant health and variety listing requirements, the nature of competition and cultural/language factors. From this screening exercise 3-4 export markets were chosen and an action plan drawn up. An action plan was also drawn up for the domestic market.

An examination of the targets for seed exports shows that some 66,000 tonnes were exported from Scotland to third countries in 2002 which was an increase of almost 17,000 tonnes on the previous year. Teagasc bred varieties amounted for 25% of such exports.

The primary source of revenue for the BPC is got from levies. These comprise of an area based levy for growers of one hectare or more of potatoes and a tonnage based levy applicable to potato purchasers each time potatoes move through the supply chain up to but not including the retail level.

2.5.2.8 Options and Outcomes

In examining the continued use of public funding on the seed certification scheme the key factors to be considered are the contribution that the scheme is making to the agricultural sector, the cost efficiency with which the scheme is operated and the alternative means, if any, of achieving the scheme objectives.

The cost of operating the seed certification services is of the order of €1.35 million and if the production of Pre-Basic seed is added the costs rise to over €2m or €193/tonne based on a total output of 10,358 tonnes of sealed and labelled seed in 2002. The addition of passported seed (over 5000 tonnes) for home use and Class X (10,000 tonnes, approx.) brings total seed available for home use to over 25,000 tonnes. The total seed requirement in Ireland is of the order of 30,000 tonnes for the ware crop and 4,500 tonnes for the certified seed crop. The balance of 9,500 tonnes has therefore to be imported or sourced elsewhere. The CSO figures for 2002 estimate total seed imports of 15,600 tonnes but the An Bord Glas Survey indicated a much lower import level of 6,000 tonnes.

Irrespective of the conflicting data, it is clear that any further contraction in seed production makes the industry vulnerable to further increases in imports. Seed exports have now practically ceased except for small quantities of high grade material sent abroad for further propagation. Scotland and Northern Ireland are the main sources of imports.

The low quantities of seed produced per hectare in Ireland is an issue which has to be addressed if a sustainable seed certification service is to be maintained in Ireland. Land that has been tested and classified for certification, visited up to 5 or 6 times by inspectors and then has a certified seed potato output of less than 10 tonnes compared to a potential seed yield of 25 tonnes or more is a costly and inefficient use of state resources. As already indicated the low certifiable seed output is a particular feature of the *'free'* varieties. However, the dominant position of the *'free'* varieties is being eroded by the *'protected'* varieties, particularly the IPM controlled Teagasc bred variety Rooster.

The Teagasc centre in Oakpark is a renowned centre for potato breeding. All the Teagasc varieties are controlled by Irish Potato Marketing Ltd under a contractual arrangement with Teagasc. Most of the seed from these varieties is now propagated in Scotland with the area planted in Ireland falling by 63% over the past decade. In 2002 IPM grew 283 Ha of seed in Ireland and 1123 Ha in Scotland. IPM have cited the poor reputation of Irish seed on export markets and the many difficulties it has experienced particularly in Mediterranean countries as the main reason why the company has concentrated in Scotland. According to IPM, the main difficulties relate to tuber diseases, particularly blackleg, which cause the tubers to decay during transport or at the subsequent destination. However, EU comparative trials, as outlined in Diagram 7, do not bear this out as the figure shows that Ireland compares favourably with northern European countries with regard to blackleg infection.

The weaknesses in the sector have been identified in many previous reports. These relate to the small scale of operations, lack of specialisation, the absence of vertical linkages in the supply chain and the absence of binding contracts between seed and ware growers. In effect

practically all of the seed production from *'free'* varieties is carried out on a spot-market basis. Growers, accordingly, hedge their bets and play both the seed and ware market. The high price of ware also contributes to this situation and growers might find it more profitable to sell the potatoes as ware rather than seed.

The development of vertical linkages between the seed grower and ware producers is also hindered by the geographical spread between seed and ware growers. About half of the marketed certified seed is produced in Donegal while most of the ware is produced in the East.

Legislative obligations

Under EU seeds legislation Member States authorities are obliged to provide a certification service but this can be delegated to a competent body as in the case of the Netherlands where NAK carry out certification under the supervision of the Ministry. This approach could also be considered in Ireland with the formation of an interprofessional body representative of seed producers, ware producers, merchants, exporters, breeders etc to operate the scheme. Such a body would also bring focus to the scheme and allow for the development of vertical linkages. This possibility could be examined. In the meantime it is considered that the scheme continue to operate under the Department of Agriculture and Food.

Against the above background, the following changes to the scheme may be considered

Administration and Operation

The Department of Agriculture should continue to operate the scheme, but on a cost recovery basis. The aim could be for a 50% cost recovery, initially, rising to 100% over 5 years. The costs of the scheme should be reasonable to growers, reflect those in competitor markets and, most critically, ensure that the integrity of the scheme is protected. The Department costs apportioned to the scheme should relate only to core activities as provided under the EC Seed Potatoes Regulations 1980 to 2003. Excluding central administration costs these represented approximately 60% or €685,000 of the total costs of the Seed Certification Service in 2002.

The costs associated with PCN sampling and analysis should be fully borne by the grower. The costs associated with other plant health activities, registration and standards, market intelligence, etc should be borne by the State but should be rationalised to provide for greater efficiencies in the use of staff resources.

Charges for Certification

The 2002 costs outlined above of €685,000 work out at €445 per hectare of certified area or €67 per tonne of seed labelled and sealed. Clearly, charges of this magnitude on growers are not feasible and accordingly costs must be brought to acceptable levels. This would involve a major rationalisation of the existing services.

There are a total of 20 TAOs who are supervised by 6 District Superintendents (DS) at local level, and at the Backweston HQ one Area Superintendent (AS) and three professional staff who are responsible for managing the scheme. The total cost of the 26 technical field staff for seed certification duties was €577,000 with Backweston staff costing €110,000. The average cost of each TAO for potato duties was €38,000 and €42,000 for the DS grade.

Currently each Technical Agricultural Officer has an average of nine growers and 59 hectares of certified seed area. The average area certified per officer in the 1980s was approximately 160 hectares, nationally, with some downward adjustment made for remote

regions with small holdings. However with streamlining of the work of the seed certification services, particularly in relation to plant health work and data collection, each officer could be responsible for at least 160 hectares of certified seed area. The staff costs associated with this would be over €400,000. These charges could be phased in over five years starting at 50% initially.

For peak inspection periods during the growing season, other competent staff should be drawn on to assist seed potato inspection staff. In Northern Ireland, the 15 potato inspectors are also responsible for cereal seed inspections during the growing season in addition to other non-potato duties.

As has been shown in other countries the charging of fees for certification that are market cost related, helps in retaining the committed seed grower in the sector. The survival of the Irish seed potato industry will depend on the development of such specialised seed producers. The provision of a free service has handicapped the development of the sector in that the State has supported an inefficient dual cropping system with most growers having less than three hectares of seed and low seed output. As shown earlier in this report larger farms and protected varieties give much higher yields.

The handling of applications with the payment of appropriate fees should be centralised in the administration Division (Maynooth). All land parcels on which certified seed is grown should be entered on the Department's Area Aid computer system and be accessible to growers. Following the Mid Term Review of the Common Agriculture Policy it will be necessary for financial control purposes for all potato areas to be recorded as they will not be eligible for area payment entitlements.

Plant Health Controls

The retention of the High Grade Seed Area is of critical importance to the development of the Irish seed potato sector. The introduction of the home saved seed '*Class X*' category in 2002 is an important development in this regard. However, the controls in place to ensure that ware growers use only Basic seed or the direct progeny thereof, produced by the same grower, must be proportionate to the risks involved. The most critical issue is that only certified basic or pre-basic seed can be marketed in the country. The enforcement of the home saved seed rule could be mainly carried out by auditing of records retained by the ware grower to show that there is compliance with the provisions of seed potato and plant health legislation. In addition, these audits should also involve checks during the growing season, all of which should be based on risk analysis criteria. These checks could be carried out by the Horticulture and Plant Health Division Inspectorate in conjunction with the audits required under the Registration of Growers and Packers Act and Food Standards Regulations. As this is a plant health issue there should be no charge levied.

PCN Testing

The sampling and analysis for Potato Cyst Nematode or potato root eelworm is provided free of charge for certified seed growers and ware growers growing home saved seed (Class X). In 2002 the technical staff costs for the 26 officers responsible for taking the samples amounted to €192,700, representing 19% of total technical costs. In addition the cost of carriage and analysis of the samples (Teagasc) was €160,600 bringing the overall costs to €353,300 or €116 per hectare certified. The total area of 3,051 Hectares inspected is made up of 1,651 Ha entered for the seed certification scheme and 1,399 Ha entered for Class X.

The sampling and testing for PCN for certified seed crops and Class X seed should in future be carried out at the grower's own expense. The PCN sampling could be carried out by the Teagasc Tillage Advisory Service or other competent agency or body. The Teagasc Tillage Advisory Service has a staff of 28 advisers located in all the main potato growing areas of the country and currently charge for the services which they provide to growers. The analysis of the samples could continue to be carried out at a Teagasc laboratory. The integration of the

sampling with the testing in Teagasc would allow for economies to develop resulting in a considerable reduction on the current costs which amount to over €350,000.

Ring Rot and Brown Rot controls

Seed Certification staff spend 4.4% of their time at a cost of €50,000 in keeping the Irish potato crop free of these serious diseases, not yet found in Ireland. Horticulture and Plant Health Division is responsible for plant health and the current arrangements should be examined in that context. However, changes to the current arrangements would not effect any significant savings.

Other Plant Health activities

The enforcement of Orders relating to Black Scab, Colorado Beetle and imported seed take up 1.7% of the time of seed certification staff at a cost of €19,000. These activities should be examined in the context of the work of the Plant Health Inspectorate.

Registration and Standards

Seed certification staff spend 4.4% of their time at a cost of €45,000 in the enforcement of the Growers and Packers Act and The Food Standards (Potatoes) Regulations. The main responsibility for the enforcement of this legislation rests with Horticulture and Plant Health Division who carry out inspections at wholesale and retail level but not on potato farms. In 2002 seed potato officers carried out 1399 inspections of 28,000 tonnes of ware under the Food Standards Regulations. This quantity was the ware component of the seed potato output of the 262 certified seed growers. Most of the inspections were carried out in conjunction with seed certification duties and amounted to an average of 5.3 inspections per farm or one inspection for every 20 tonnes of ware sold. These potatoes may be subjected to further inspections at wholesale and retail level by officers of the Horticulture/Plant Health Division. In addition growers who are registered with the Bord Glas Quality Assurance Programme are audited twice per year by their inspectors to ensure compliance with the programme.

In view of the fact that most potatoes are now marketed through merchants and wholesale premises with exacting standards being sought by the retail multiples, inspections under the Food Standards Potato regulations should be concentrated in wholesale premises with random inspections of growers to check compliance. Inspections under the Growers and Packers Act should also be based on a similar strategy. The Horticulture and Plant Health Division should have responsibility for the enforcement of these Regulations along the whole supply chain. (See section 2.1)

Market Intelligence

In 2002 non-statutory services comprised 12.8% of the time of Seed Certification staff costing €146,000. Most of the activities in this area were in the collection and provision of market information, potato blight warnings etc. While this is a time consuming and costly activity it is not core work of Seed Certification staff. Accordingly, alternative ways of providing this service requires consideration. In addition to the Seed Certification Division there are five different groups assembling market information – Horticulture/Plant Health Division who are responsible for collecting wholesale prices, Crop Production and Safety Division who report prices to the EU Commission, Bord Glas who have a statutory remit in the area and Teagasc who also collect information in order that they can fulfil their mandate.

The streamlining and reorganisation of the market intelligence function is clearly required on both efficiency and cost fronts. As there are no EU obligations to report potato prices to the EU Commission Bord Glas should have the central role in the collection and dissemination of such information. They should be supported in this role by the technical staff of the Horticulture and Plant Health Division who would provide weekly prices at selected centres in the course of their inspections under the quality standards regulations.

The Registration of Growers and Packers Act provides the legislative basis for collecting all the necessary data on potato growers in the country. This database should be updated annually by Crop Production and Safety Division and provide all the information currently provided through the annual surveys. This information could be complemented by the Teagasc Advisory staff who maintain their own database on all growers for their own purposes.

Other issues

The introduction of levies on potato sales to support the marketing of potatoes should be considered.

A summary of the options and outcomes for the seed certification services is given in Table 102.

Table 102: Options and Outcomes for Seed Certification Services

Service	Options	Financial Implications
Seed Potato Certification Scheme	-DAF to continue to administer scheme -Applications to be centralised -Full cost recovery of inspections -Class X: enforce through inspection/audit in conjunction with Registration and Standards Controls (below) using risk analysis criteria.	Inspection costs of core certification work reduced from €577,000 to €400,000 and half of this recouped in fees in the first year and all in 5 years **Total Savings €577,000**
Plant Health Controls	PCN(eelworm): growers responsible for costs of sampling and analysis of the areas to be sown with certified seed and class X.	Costs of PCN analysis of €160,000 eliminated. Staff costs associated with sampling included in the certification charges above. Savings of € 193,000. **Total savings €353,000**
Registration and Standards	Enforcement of the Growers and Packers Act to be responsibility of Horticulture Division with inspection concentrated at wholesale premises. Food Standards Regulations: Seed potato inspectorate to discontinue inspections at farm level. Inspections to be mainly concentrated in wholesale premises and conducted by Staff of Horticulture/Plant Health Division. Synergies to be developed with other inspection agencies regarding retail inspections.	Savings on staff time of €45,000 **Total Savings €45,000**
Market information and other activities	Market information to be centrally co-ordinated by Crop Production and Safety Division, Horticulture and Plant Health Division in conjunction with An Bord Glas. Teagasc to supply information on blight warnings in conjunction with DAF	Savings on staff costs of €146,000 **Total savings €146,000**
		Overall costs of seed certification services reduced from €1,352,000 to €231,000 **Total Savings €1,121,000**

2.6 Plant Breeders Rights

2.6.1 Legal Basis

The legal basis for the operation of Plant Breeders' Rights on potato varieties stems from EU and National Legislation. EU legislation is based around Council Regulation 2100/94 and associated Amending / Implementation Acts: 1768/95; 1238/95; 1239/95; 329/2000 and 2605/98.

National Legislation is based upon the 'Plant Varieties (Proprietary Rights) Act' of 1980 (24 of 1980) and its Amending Act, 41 of 1998, and all associated Statutory Instruments: 493 of 2000; 492 of 2000; 491 of 2000; 490 of 2000; 489 of 2000; 332 of 1993; 78 of 1993; 369 of 1992; 35 of 1992; 31 of 1991; 199 of 1990; 46 of 1988;
46 of 1986; 284 of 1985; 137 of 1984; 19 of 1984; 409 of 1981; 23 of 1981; 22 of 1981and 190 of 1981.

2.6.2 Objectives

The objectives of the Office of the Controller of Plant Breeders' Rights are to:

- Grant proprietary rights to suitable applicants who wish to market commercial varieties of any genus or species in Ireland.
- Maintain a register of varieties in which rights have been granted in Ireland.
- Publish the bi-annual 'Official Journal of National Plant Variety Rights', which is distributed to interested parties nationally and internationally.
- Collect renewal fees that accrue on varieties that have Plant Breeders Rights' granted.
- Liase with the European Plant Breeders Rights Organisation, (CPVO) and the International Plant Breeders Rights organisation (UPOV).
- Liase with counterparts in other member states and internationally on issues relating to Plant Breeders' Rights.

2.6.3 Plant Breeders' Rights Procedures

An applicant completes a technical questionnaire on the variety that he/she proposes to the Office. This questionnaire is species specific and is based on UPOV guidelines. The applicant also submits a completed application form along with the appropriate administration fee of €253.95. A DUS certificate is also required, outlining that the variety is Distinct, Uniform and Stable, authorised by a CPVO recognised competent authority for that species.

Once the appropriate documents have been received, the Office of the Controller of Plant Breeders' Rights can then publish a proposal for naming the variety. This proposed name is published in the bi-annual 'Official Journal of National Plant Variety Rights' and also the international network via UPOV and CPVO. Any objections to the proposed name of the variety are submitted back to the Office of the Controller of Plant Breeders' Rights, who can defend the name of the variety or approach the applicant for other names. If a new name is required, this again is proposed by the Office of the Controller of Plant Breeders' Rights, though the same channels.

Two months from the date of publication of the proposed variety with no objections, the Office of the Controller of Plant Breeders' Rights can then grant Plant Breeders' Rights on the variety to the applicant, subject to receiving the appropriate grant fee €127. Grants are valid for 30 years in respect of varieties of Trees, Vines and Potatoes, and 25 years for all other species. Annual renewal fees of €317.43 are required for varieties with national protection which are published in the 'Official Journal of National Plant Variety Rights'. For varieties with EU protection and dormant rights in Ireland there is a fee of €63.49

The Senior Inspector in charge of the Seed Testing Division in the Department of Agriculture and Food is the Controller of Plant Breeders Rights in Ireland. Administrative support is provided by Crop Production and Safety Division.

There are a total of 78 varieties across a number of plant species which have been registered for Plant Variety Rights in Ireland of which 46 are potato varieties. There is in addition two potato varieties with applications awaiting grants and nine varieties with applications awaiting further documentation or names.

Teagasc has rights to 19 of the potato varieties registered which are listed below (Table 103 along with the date on which the rights were granted and expire.

Table 103: Teagasc Potato Varieties subject to Plant Breeders Rights

Variety	Date on which Plant Breeders Rights granted	Date of expiry of Rights	
Anna	01/04/1991	31/3/2021	B*
Avondale	01/07/1983	30/6/2013	A**
Balmoral	01/04/1989	31/3/2019	A
Banba	01/04/2001	31/3/2031	B
Barna	01/04/1991	31/3/2021	B
Burren	01/10/1993	30/9/2023	B
Cara	01/04/1982	31/3/2012	A
Cultra	01/07/1986	30/6/2016	A
Druid	01/07/1993	30/6//2023	B
Emma	01/04/2001	31/3/2031	B
Orla	01/04/1997	31/3/2027	B
Red Cara	01/07/1983	30/6//2013	A
Rooster	01/07/1990	30/6//2020	B
Shannon	01/04/1995	31/3/2025	B
Slaney	01/07/1990	30/6//2020	B
Tulla	01/04/1991	31/3/2021	A

*Varieties with EU protection and dormant rights in Ireland
** Varieties with national protection

2.6.4 Outputs and Outcomes

A summary of the outputs and outputs of the programme is provided in Table 104

Table 104: Summary of Outputs and Outcomes of Scheme on Plant Breeders Rights

Plant Breeders Rights	. Proprietary rights granted . Register of varieties maintained . Bi annual Official Journal published . Fees collected . Liaison with European Plant Breeders Rights Organisation and International Plant Breeders Rights Organisation	. Forty six varieties with valid grants on National Plant Variety Rights . Two varieties awaiting grants . Nine varieties with application pending . Long term presentation of Plant Breeders Rights	The number of applications for and the granting of Plant Breeders Rights varies from year to year. Applications may now be made at EU level.

2.6.5 Resources

The staffing resources and costs involved in the above schemes are outlined in Table 105

Table 105: Staff Costs for Plant Breeders Rights

	No Staff and Grade	Total staff Costs	% of time this Scheme	Staff Costs this scheme
Inspectorate staff Backweston	1 SI (2%) 1 AI(7%)	€187,634	4%	€8,101
Administrative Staff	1PO, 1AP, 1HEO, 1E0, 1CO	Negligible	-	-
Total				€8101

2.6.6 Evaluation

Out of the total number of plant breeders rights registered in Ireland potatoes make up 46 of the varieties out of the total of 76 registered. The costs associated with the scheme in 2002 was €8000

The Department holds the Office of Controller of Plant Breeders Rights.

Outcomes

The scheme for Plant Breeders Rights is governed by national, EU and International regulations. The scheme is administered efficiently by the staff of the Seed Certification Division at the Backweston Centre at an estimated cost in 2002 of €8000.

Chapter 3

Schemes and Services provided by State Agencies

3.1 Teagasc

Teagasc is the national body with responsibility for providing advisory, research, and development services geared to the Irish agriculture and food industry and rural communities.

3.1.1 Research and Development Programmes

The potato breeding programme undertaken at the Teagasc Research Centre in Oakpark, Carlow, consists of breeding improved potato varieties for the domestic and seed export markets. The complimentary sub-programmes involve the propagation of virus-tested seed stocks of new seedlings and the assessment of their disease resistance. Other research on potatoes is also carried out. The research programme may be summarised as follows:

- Breeding varieties for the seed export trade in UK and Mediterranean countries (a number of new seedlings from the programme showed excellent promise, some selections out-yielded the standard variety Cara by over 20%).
- Control of late blight: Decision Support Systems (DSS) for the control of potato late blight were evaluated in trials at Oak Park Research Centre over a 3-year period. New fungicides being developed by industry gave superior control of blight than existing products. Fungicides, which enhance the natural resistance of the potato to late blight, showed excellent promise.
- Effects of liquid and solid fertiliser formulations on yield and quality of ware potatoes.
- The effects of elevated concentrations of carbon dioxide and ozone on potato yields.
- Breeding disease resistance, screening and seed propagation of new potato varieties.
- The effects of seed treatment and harvest date on the yield and quality of ware potatoes and potatoes for processing.
- Epidemiology and control of Pink Rot of potatoes.
- Storage of tubers for the fresh chip trade.

Breeding Programme

Potatoes have been bred at the Oak Park Research Centre centre since 1962. Since 1972 Oakpark has a contractual agreement with Irish Potato Marketing, Ltd (IPM) Ltd., a subsidiary of Donegal Creameries Plc, through which IPM are the sole marketing agents worldwide for Teagasc bred varieties. These varieties are protected by plant breeders rights through which IPM collect royalties. To-date over 30 varieties have been released from the programme with over 15 of these varieties still in commercial use.

The process of breeding, testing and multiplying a new potato variety from the making of the initial cross until the new variety can be commercially grown, takes about 15 years. Apart from the laboratory facilities in Oakpark, most of the selection and propagation is carried out at isolation facilities in the Wicklow mountains. This isolation facility covers an area of about 10 hectares and is made up of plots varying from single plant plots to 1-15000 plant

plots. All plants from Year 4 onwards are sampled and tested serologically for the potato viruses - PVX, PVS, PVA, PVM, PVY, and PLRV-using the ELISA technique. Visual inspections are carried out at weekly intervals and the health status is confirmed by Seed Certification Services of the Department of Agriculture and Food.

Seed of the selected seedlings are sent for trial to different countries, while the remainder is used for further propagation, disease resistance screening and demonstration. While National List Trials are being carried out by the Department, a breeders stock is handed over to IPM, so that, when a new variety is named, National Listed and obtains Plant Breeders Rights, adequate seed stocks are available for initial commercial assessment at farm level. In year 8 of the breeding programme, meristem- tip cultures of all seedlings are handed over to the Department (Tops Centre) to provide the initial propagation material for future multiplication under the Seed Certification Service. Using the same technique, old potato cultivars are cleared of virus infection and added to the collection of virus free stocks of cultivars.

Objectives of the Breeding Programme

- Breed a red skinned white fleshed alternative variety with high dry matter to replace Kerrs' Pink and compliment Rooster in the Irish trade.
- Breed high yielding maincrop and early maincrop varieties with resistance to potato cyst eelworm *Globodera pallida.*
- Develop high dry matter disease resistant varieties for the home Ware trade.
- Breed high dry matter early and early maincrop varieties suitable for the processing trade.
- Breeding 1st and 2nd early potatoes suitable for the U.K. and Irish markets.

Outputs and Outcomes of the Breeding programme

Of the 17 Teagasc bred varieties available, five of these were grown for seed and ware in Ireland in 2002. A breakdown of the area grown for each of these varieties is presented in Table 106 They now account for 18% of the seed area and 32% of the ware area grown nationally. Rooster accounts for 76% of the Teagasc varieties sown for seed and 97% of those sown for ware.

Table 106: Teagasc Bred Varieties 2002

(Hectares)

Variety	Area Classified For Seed Production	Area Grown For Ware
Ambo	-	-
Anna	-	-
Avondale	-	-
Barna	-	-
Burren	-	-
Cara	61	95
Camelot	-	-
Christina	-	-
Colleen	2	13
Druid	2	2
Glenroe	-	-
Malin	-	-
Orla	2	2
Red Cara	-	-
Rooster	216	4,177
Shannon	-	-
Slaney	-	-
Total Teagasc Varieties	**283**	**4289**
Othe Varietiess	1,256	9,142
Totals	**1,539**	**13,431**

The areas of Teagasc bred varieties grown in Ireland for seed have declined considerably in the 90's as outlined in Table 107 IPM market approximately 30,000 tonnes of seed potatoes from these protected Teagasc varieties annually to 30 countries worldwide. Over 80% of IPM's production is grown in Scotland.

Table 107: Teagasc varieties sown compared to total seed area sown 1992/2002

Year	Total area of seed (Ha)	Total Area of Teagasc bred varieties (Ha)	Teagasc bred varieties as % of total area
1992	2851	768	27%
1994	2847	446	16%
1996	3003	816	27%
1998	2217	422	19%
2000	1754	317	18%
2002	1539	283	18%

Some of the reasons given by Teagasc for the decline in the export trade of its varieties are outlined in Section 1.4.

Resources

The total operational costs of the breeding programme in 2002 was €776,134 of which 70% (€543,000)was recouped from IPM through royalties and grants. The balance of the operational costs (€233,000) including the capital costs are carried by the State. Teagasc aim to recover all operational costs by 2007 from its agent.

In 2002 the following staff resources were attributed to the programme:

Research officers 2.35 Full Time Equivalents
Technicians 3.45
Industrial Grades 5.10

The following key linkages are in place between Teagasc and the Department:

- All Teagasc bred seed grown for foreign and domestic trials are grown on land sampled for Potato Cyst Nematode (PCN) by Department of Agriculture staff. The growing seed crop is inspected weekly by Dept potato inspectors. Produce is also inspected prior to export and plant passport issue. These services are provided free.
- Teagasc provides the Department with a soil analysis service for potato cyst nematode testing. In 2002 this analytitcal service cost the Department approximately €160,000.
- All Teagasc varieties are national listed in Ireland and undergo VCU and DUS trials with DAF. DAF carries out this service free of charge.
- Entry to the seed certification scheme for Teagasc varieties is via delivery of meristem tip cultures to the Tops farm for subsequent multiplication and certification.
- DAF (Tops) and Teagasc are joint maintainers of Teagasc varieties.
- DAF and Teagasc jointly maintain the Irish potato variety collection in conjunction with IPGRI who co-ordinate activities of similar collections in the EU.
- DAF provide facilities to Teagasc for disease resistance testing of Oak Park varieties. Most notable of these is wart disease for which the resistance status of a variety must be known before it can be released.
- Teagasc perform all quality cooking and processing evaluations for DAF national and recommended list trials.

- Through the seed certification DAF supplies statistics of the area and quantity grown of Teagasc varieties. This assists in the collection of royalties by IPM and in the analysis of varietal performance

Comment

The Terms of Reference of the Expenditure Review of the potato sector does not include an evaluation of Teagasc schemes or other schemes carried out by other state agencies. However, the breeding programme is intrinsically linked with the Department's schemes and officers of the Department provide services to Teagasc. The costs of these services are not included in the figures above.

The Teagasc potato breeding programme has been examined by Boyle[20] *et al* in which the costs and benefits of the research programme over the period 1962 – 1998 have been evaluated. On the basis of the assumptions used in the analysis, the report concludes that '*the greatest fraction of the estimated research benefits from 1981 onwards is due to the royalties accruing to the programme as a consequence of the generation of new varieties. It will be noted that, while we estimate a rate of return in excess of 5%, which is the rate recommended by the Department of Finance as being appropriate for public sector projects, this is substantially below the high rates generated for agricultural research in the international literature. In addition, a return in excess of 5% is due to the inclusion of the economic activity generated by the marketing and distribution sector (IPM) and it has to be acknowledged that a number of strong assumptions were employed to get usable estimates'*.

3.1.2 Advisory Service

Objectives
The overall objective of the Teagasc potato advisory service is to improve technical efficiency and the adoption of best management practices with the aim of growers achieving an average yield of 40 tonnes per hectare and maximising their income from the crop. The provision of a continuous supply of potatoes to the market throughout the year is a key feature within this objective.

Outputs and outcomes
Teagasc potato advisers are involved in all aspects of seed and ware production and deliver the service to producers through one-to-one consultations, farm visits, discussion groups, newsletters, exhibitions, conferences, etc. The outcome of these activities is the transfer of modern technology from Irish and overseas research and development activities to Irish growers. These activities cover cultivations, planting, pesticides, harvesting, storage and issues relating to selection of varieties, herbicide programmes, dessication, brushers, washers, etc. The potato advisory service assists farmers in preparing and submitting applications for the potato grants storage.(See Section 1.3)

Resources
The programme is delivered through one full time National Potato Specialist and 27 locally based potato crop advisers. The crop advisers also cover other tillage crops with the time spent on potatoes equivalent to an estimated five full time units) The potato advisory service is supported by other Teagasc advisory specialists and research staff. The total direct costs to the state – salaries, travel and subsistence – for the 5 full time equivalents is €300,000. There is a charge levied on grower clients for the services provided.

[20] The Costs and Benefits of Agriculture Research in Ireland (November 2002)

3.1.3 Other activities

The Teagasc recording system tracks the initial outbreak of potato blight in the different growing areas with the aim of helping growers to implement effective blight control programmes. All potato growing areas are monitored by the specialist potato advisers in Teagasc as well as the potato inspectors of the Department of Agriculture and Food. Teagasc also collaborates with Bord Glas in a number of projects including relation to the National Potato Census, National Yield Estimation and the fresh chip project.

3.2 Bord Glas

The statutory remit of An Bord Glas is to develop, promote, facilitate, encourage, co-ordinate and assist the production, marketing and consumption of horticultural produce.The remit also provides for consultations in relation to the horticultural content of Teagasc's annual programme of activities. In addition, the Board's mandate includes a consultative role in relation to:

- The establishment and enforcement of grading and quality standards for horticultural produce;
- The formulation and implementation of policy on state investment;
- The formulation of curricula for higher education.

Objectives

The Bord Glas strategic objectives as set out in the 2000-2006 Development Plan are as follows:

- Support measures to increase investment in the industry in terms of efficiency and capacity capital investments. The expansion of the glasshouse infrastructure for the protected crops sector is a special priority for investment.
- Maintain and extend effective supply chain linkages in order to facilitate business opportunities.
- Develop co-ordinated industry policies in association with other State agencies.
- Develop and extend business competencies to match the changing needs of the industry.
- Support existing and new business opportunities and initiatives that lead to the maintenance and growth of domestic market share for horticultural produce.
- Establish and maintain quality assurance standards for the horticultural industry in order to sustain consumer confidence in horticultural produce.
- Provide a comprehensive range of independent market intelligence on industry developments, needs and priorities, in order to assist with its planned development.
- Promote the positive benefits associated with horticultural produce with a view to maintaining and stimulating demand.

Whle the programme indicators are totally within the control of Bord Glas, there are broader national indicators which are affected by a number of other organisations and influences outside of Bord Glas. These national policy indicators include domestic output and retail sales and these in themselves provide valuable comparitative indicators of the state of the horticultural industry on an annual basis. Chapter 1 of this report describes the key national indicators for the potato sector over the past decade.

In the attainment of its strategic objectives for the potato sector, An Bord Glas expended €359,440 in 2002 in the following Development Programmes:

1. Promotions (€155,220)
2. Market Intelligence (€88,620)
3. Quality(€41,650)
4. Business Development (€46,000)
5. Industry Development (€29,250)

The objectives of each of the programmes are summarised below:

Promotions

An integrated and generic promotions campaign assists in maintaining and increasing consumer confidence and demand for horticultural produce. Promotional activities are based on maintaining and increasing consumer confidence in domestically produced fruit, vegetables and potatoes, thereby promoting increased consumption. Key objectives of the Promotional Programme are:

- Increase consumer awareness of key Bord Glas promotional message from 40% to 60%
- Increase to 75% the proportion of population who consume four or more servings of fruit, vegetables and potatoes per day.

The following are key activities in the promotions programme:

- National Potato Week - in association with the IFA and Potato merchants
- National advertising - billboard, bus shelters, buses in Dublin
- In-store tastings
- PR Photo launch - new season potatoes
- Promotional Literature - Recipe leaflet
- Potato Catering guide
- All Ireland Potato Championship Sponsorship
- National Potato Conference Sponsorship

MARKET INTELLIGENCE

Providing information on industry needs and new market opportunities will facilitate the continued development of the horticulture industry. There is a growing need to provide relevant and timely information which will enable policy makers and industry players to plan and manage industry and business development. This information will also be essential to ensure that future industry strategies are well founded and progressive.
The programme aims to provide a one-stop shop for the horticultural industry. It provides information on all aspects of the industry, including information on;

- Production patters
- Market dynamics
- Consumption trends

The following are key activities of Market Intelligence programme:

- National Potato Census
- Potato yield digs (main crop & 2nd earlies)
- Monitor retail prices (Taylor Nelson Sofres)
- Farm Gate Prices, stock levels etc
- Market Research - qualitative and quantative

-Quality Programme

- Implement the Bord Glas Quality Assurance Scheme

QUALITY PROGRAMME

Quality has become a critical issue within the horticultural industry. Consumers demand produce which has been grown, handled, packaged, stored and transported to the highest standards of quality and hygiene in a clean and environmentally friendly manner. Consumers are becoming increasingly concerned about food safety and traceability. The Bord Glas Quality Assurance Programme aims to address these issues and ensures the correct standards are in place.

The key element of the programme is the independent inspection and certification of producers and packers by the National Standards Association of Ireland (NSAI) which is accredited to EN45011 by the National Accreditation Board (NAB).

The following are key activities of the programme**:**

-Quality auditing and Certification
-Residue testing
-Prepared sector Quality Programme
-Quality video for potato production

BUSINESS DEVELOPMENT PROGRAMME

The Business Development Programme is a comprehensive package providing training and support for Irish horticultural enterprises. Continuing education, training and support is a fundamental key in obtaining and retaining the competitive edge in today's dynamic business world. Keeping abreast of changes within the industry and embracing appropriate new techniques is essential for the viability of any business. The programme has been devised to positively impact on an individual enterprise's ability to compete effectively in an increasing demanding marketing place.

The following are key activities in the programme

- Business Management Training Programme
- Business Support Programme

INDUSTRY DEVELOPMENT

The Industry Development programme seeks to address issues of critical importance, which can have a positive impact on the overall development of the Irish Horticultural Industry. The programme provides an opportunity to examine and resolve issues of common concern and to ensure that activities across the sector are fully harmonised.

The following activities are carried out under the Business development Programme

- the displacement of potato imports for fresh chips
- Waste management
- Monitoring labour markets
- Developing value added programme

Resources

Each of the five Development Programmes is managed by a dedicated Development Marketing Executive (DME) with the support of administrative personnel. It is estimated

that the total Bord Glas manpower resources allocated to the potato sector is equivalent to one full time DME.

The total staff costs are estimated at €54,984 and operational costs at €359,440.

3.3 The State Laboratory

The Department avails of the services of the State Laboratory to test potatoes for quality and safety.

Under Article 2(2) of Council Directive 93/85/EEC on the control of potato ring rot and Article 2(3) of Council Directive 98/57/EC on the control of brown rot, EU Member States are required to submit details and results of annual surveys of these organisms. The State Laboratory conducts this analysis during the early months of the year on behalf of the Plant Health Division of the DAFRD.

Samples are tested for both diseases using immunological and molecular biology procedures.

Further disease control measures for these organisms include the monitoring of imported potatoes (ring rot and brown rot) and the monitoring of wash water from potato processing factories and irrigation water from rivers (brown rot). The latter is done during the summer months when climatic conditions are more favourable for disease propagation.

Each 'sample' comprises 200 potatoes. The number of survey potato samples is typically in the range of 500 to 550 per annum. The number of imports
requiring testing varies from year to year: 110 were tested in 2001 and approx 65 were tested in 2002. 21 samples of water from processing factories were tested n 2002.

The State laboratory does not currently charge for this service.

CHAPTER 4

RELATIONSHIP/COMPATABILITY OF THE SCHEMES IN THE POTATO SECTOR WITH THE DEPARTMENT'S STATEMENT OF STRATEGY 2003 - 2005

The Mission Statement of the Department of Agriculture and Food outlined in the Statement of Strategy 2003 – 2005 is *'To lead the sustainable development of a competitive, consumer focused agri-food sector and to contribute to a vibrant rural economy and society*'.

In the attainment of this mission the Statement of Strategy emphasises the importance of the development of a successful agri-food sector to our national prosperity and to rural communities. It points out that to achieve this goal we must produce safe food and in so doing maintain a high standard of animal and plant health. The Statement recognises that much of the support schemes are provided at EU level and that much of the legal framework for trade is agreed at international level. On the domestic front, the Statement recognises that the maintenance of the maximum number of farm households, the protection of the environment and support for sustainable agriculture are a vital part of the Department's work. The need for the Department to deliver a quality service to its customers and to provide this service efficiently and effectively are key components of the Statement.

On the budgetary situation the Statement points out that *'all Government Departments will be required to operate within a tight budgetary framework over the period covered by the Statement — — and a rigorous approach will be needed to ensure that all schemes and services operated by the Department provide real value for money and are operated efficiently and effectively'*. The Statement adds that *'The Department is fully committed to the need to ensure value for money in the management of resources, the need to focus on service and outputs and the need to analyse and evaluate new and existing programmes'*.

In the achievement of the above there are six main goals:

1. Agri food development and trade: *Develop an internationally competitive agri-food sector and support and facilitate trade in agriculture and food products*;
2. Food safety, animal health and welfare, plant health: *Ensure the highest standards of food safety and consumer protection, animal health and welfare and plant health*
3. International framework *Achieve: the optimum framework for the agri-food sector, rural economy and the natural environment at EU and the wider international level and enhance Norht/South co-operation*
4. Rural Economy and Environment: *Promote the development of the rural economy and of environmentally friendly and sustainable systems of agriculture and food production*
5. Schemes Delivery and Financial Management: *Operate all our schemes and programmes in an efficient and effective manner, and ensure the highest standards of corporate and financial management and accountability in all our activities.*
6. Operational Capabilities *Develop: our human and physical resources and our operational capabilities and ensure the delivery of quality service to our customers, both internal and external*

Each goal has a key number of strategies and these form the basis of each Divisions Business Plan in the delivery of the Department's programmes.

The compatability between the programmes in the potato sector and the relevant goals/strategies in the Statement of Strategy 2003-2005 is summarised in Table 108.

Table 108: Compatability of Schemes with the Statement of Strategy (2003-2005)

Goal No	Strategy	Scheme/ programme	Compatability of scheme with statement of strategy
1.4	Promote market orientation, productivity and innovation in agriculture and food	NDP grant aid scheme Variety Evaluation Scheme	NDP scheme has been a very effective instrument in the modernisation of the potato sector and providing for market orientation. A stable industry has emerged, supplies of quality potatoes are available all year round and there is less dependency on imports for the fresh market. The identification of superior varieties under the scheme has contributed to increased productivity at farm level and the most suitable varieties for the table and for processing.
1.5	Support the Agri-food industry in its efforts to retain and expand export markets	Seed Certification Scheme	Exports of certified seed have fallen to 440 tonnes in 2002. Imports of seed potatoes have increased. Scottish exports of Teagasc bred varieties continue to increase reaching 16,000 tonnes in 2002.
1.6	Operate and promote services to ensure high quality standards in food products	Registration and Standards for potatoes	Inspections of ware potatoes under the Food Standards (Potato) Regulations ensures that only high quality potatoes are placed on the market. The registration of growers and packers ensures that there is full traceability in place.
1.8	Operate and support services to ensure basic inputs to the agri-food sector are of the highest quality, including crop variety testing, seed certification and testing and animal breeding.	Variety Evaluation scheme Seed Certification Scheme	The scheme contributes to the selection of the most suitable and profitable varieties for the Irish market. The scheme ensures that high quality seed potatoes are available for Irish growers.
1.9	Support Teagasc, An Bord Bia, Bord Glas in the discharge of their statutory functions and ensure effective implementation of their work programmes	Potato Standards Seed Certification Scheme Variety Evaluation Scheme	The Department has supported the Quality Programme introduced by an Bord Glas which has promoted high quality standards for potatoes. Co-operation between the Department's Seed Certification Division and Teagasc Oakpark regarding potato breeding programme Co-operation between the Department's Variety Testing Division and Teagasc Oakpark in the selection and evaluation of varieties
2.13	Operate an efficient and effective plant health service including implementation of the annual inspection plan	Plant Health Control Scheme	The services provided under the Plant Health Control scheme ensures that the high health status of Irish potatoes is maintained. The measure is effective.
4.2	Develop and implement policies, schemes and services that help to sustain the rural economy and facilitate structural change	Grant aid scheme	The scheme has contributed to the development of some 800 specialised potato farms with modern facilities with a market output of €100m (2002).
4.15	Develop measures to ensure the survival and appropriate use of plant and animal genetic resources for food and agriculture	Seed Certification Scheme (Tops)	The national collection of potato varieties is maintained at the Tops Centre. Teagasc also maintain a collection of varieties at the Oakpark research Centre.
5.9	Undertake regular evaluations of key spending areas through the expenditure review programme and the mid-term evaluation of the NDP and CAP rural development plan measures.	All potato schemes	The findings in this report indicate considerable scope for improving the cost effectiveness of most of the potato schemes. There is a need for more immediate and effective measures, other than expenditure reviews, to ensure that all schemes are providing value for money and are continuously adapted and adjusted to the changing policy environment within which they function.

From this Table it is seen that there is a high degree of compatability between the programmes carried out in the potato sector and the goals/strategies in the Statement of Strategy with the exception of Goal 1.5 which refers to the expansion of export markets. The changes in exports and imports are dealt with extensively in the report. On the issue of cost effectiveness of the programmes there is scope for improvement in most of the potato schemes. There is also a need for more immediate and effective measures, other than expenditure reviews, to ensure that all schemes are providing value for money and are continuously adapted and adjusted to the changing policy environment within which they function.

CHAPTER 5

Recommendations, Financial Impact and Indicators

5.1 Recommendations

1. The Food Standards (Potatoes) Regulations and the EU Fruit and Vegetable Standards Regulations should be included in a Service Contract with the FSAI. Inspections should be based on risk analysis with participation in Bord Glas Quality Programme factored into the risk. DAF officers should mainly concentrate on wholesale premises while enforcement of the potato labelling legislation in retail outlets should be part of the general labelling enforcement under the FSAI. Horticulture and Plant Health Division should be responsible for all DAF inspections, including inspection of growers under the Food Standards Regulations and the Registration of Potato growers and Packers Act.

2. Horticulture and Plant Health Division should have overall responsibility for plant health controls for potatoes including those currently carried out by Seed Certification Division. Plant Health Controls for potatoes are obligatory under EU regulations and essential for the maintenance of the country's high plant health status.

3. Grants for Capital investments in the potato sector should continue but be mainly targeted at value added projects. The existing administrative arrangements are satisfactory and should be maintained.

4. The Potato Variety Evaluation scheme should continue under DAF in Backweston on a cost recovery basis.

5. Production of minitubers and pre-basic seed, currently carried out at the Tops Centre, should be carried out by private operators and growers. The role of the State should be in providing the germplasm from which virus-free stock can be propagated by private operators and growers. Tops or Teagasc Oakpark could provide the germplasm. Most of the other activities in Tops could also be carried out at the Teagasc Oakpark Research Centre.

6. The Department of Agriculture and Food should continue to operate the seed certification scheme. There should be full cost recovery on field charges for the seed certification service. The following operational changes will be required:
   - Each Technical Agricultural Officer would be responsible for certifying at least 160 hectares of certified seed. Inspection fees should be charged starting at 50% and rising to 100% over five years.
   - The current field classification scheme for non-certified home grown seed (Class X) should be replaced in the main by a risk based audit inspection programme of growers and their records. Inspections would be carried out by officers of the Horticulture and Plant Health Division in conjunction with their inspections relating to the Registration and Standards Regulations.
   - The sampling and testing for Potato Cyst Nematode (PCN) should be carried out at the grower's own expense.
   - The collection of market information should be centralised in Crop Production and Safety Division/Horticulture and Plant Health Division (Maynooth). A data base should be developed to capture all information relevant to the potato schemes operated by the Department.
   - Application forms and fees for the seed certification scheme should be centralised in Crop Production and Safety Division. All potato areas should be included in the Department's *iMap* database.

7. The Office of the Controller of Plant Breeders Rights should continue in the Department of Agriculture and Food. Fees and administrative charges should be subject to annual review.

Other Recommendations

8. Teagasc should endeavour to maximise the contribution of its potato breeding programme to the Irish economy and provide a comprehensive research, advisory and information service for the seed potato sector.
9. Bord Glas should have primary responsibility for the collection and dissemination of market intelligence. The participation of growers in the Bord Glas Quality Scheme should be a pre-condition of state support.

5.2 Financial Impact

The financial impact of the various options and recommendations are summarised in Table 29 (Registration and Standards), Table 34 (Plant Health), Table 39 (Grant Assistance), Table 48 (Potato Variety Evaluation), Table 70 (Tops Centre), Table 102 (Seed Certification services) and section 2.6.6 (Plant Breeders Rights)

The overall costs of the programmes and financial impact of the recommendations are outlined in Table 109. The total costs of the schemes provided by the Department in 2002 is estimated at €2.49m. This is broken down between staff costs (€2.2m), operational costs (€0.28m). The inclusion of the Capital grant aid of €0.72m which was provided to the sector in 2002 brings the total costs to €3.21m.

The staff and operational costs of the programmes provided by Teagasc and Bord Glas amounted to €1.49m (Table 110) but when income of €540,000 received by Teagasc for variety rights is included, these costs fall to €0.95m. Accordingly, the total staff, operational and grant costs of all the State programmes amount to €4.2m.

The Capital costs associated with the Department and Teagasc schemes are additional to these costs. The value of the capital resources associated with potatoes at the Tops and Backweston Centres is estimated at €3m (see Table 23).

The implementation of the recommendations in the Report could effect savings to the Department in staff and operating costs of the order of €1.6m to €1.8m. However, there would be some capital and operational cost increases in Teagasc if that body took on the duties currently carried out in the Tops Laboratory. There may also be a need for a grower subsidy for pre-basic seed production for a limited period should the Department withdrew from this activity, as recommended.

Table 109: Costs of Department schemes in 2002 and Financial Impact of Recommendations

Scheme	Staff Costs			Operational Costs	Total Costs	Financial Impact of recommendations on 2002 costs
	Inspectorate/ Technical/ Industrial	Admin	**Total**			
Registration and Standards	117,820	40,868	158,688	-	158,688	Costs of inspections reduced to €100,000 (includes inspection of growers previously carried out by Seed Certification Division)
Plant Health Controls	119,165	8,151	127,316	-	127,316	No change
Grant Assistance	20,614	22,131	42,745	-	42,745	No change*
Variety Evaluation	130,038	8,100	138,138	15,300	153,438	Cost of scheme reduced to €75,000 (est) through charges and efficiencies.
Tops Centre	535,395	40,686	576,081	75,003	651,084	Cost** of scheme reduced between €100,000 - €300,000
Seed Certification	1,122,230	40,686	1,162,916	189,652	1,352,568	Cost of scheme reduced to €250,000
Plant Breeders Rights	8101	Negligible	8,101	-	8,101	No change
Total	2,053,363	160,622	2,213985	279,955	2,493,940	**Est reductions €1.6m to €1.8m**
% of Total	82%	7%	89%	11%	100%	

*NDP capital grants of €722,383 paid in 2002
**excludes capital savings in Tops

Table 110: Cost of schemes carried out by Teagasc and Bord Glas in 2002

Service	Staff Costs	Operational Costs	Total	
Teagasc Research Advisory	 300,000		 776,134** 300,000	Capital investment in facilities and additional staff would be required if Tops Laboratory/glasshouse activities were transferred to Oakpark.
Bord Glas	54,984	359,440	414,424	A minituber production subsidy may be required in the initial stages.
Total			1,490,558	

** excludes capital costs

5.3 Performance Indicators

The compatability of the schemes in the potato sector with the Statement of Strategy are outlined in Table 111. The Statement of Strategy provides a list of performance indicators against which all Department schemes and services should be measured. Arising from this Review it is considered that more specific indicators, particularly from a financial perspective, would be of assistance to management in planning programmes and prioritising work in a tight budgetary framework. It is also important from a policy perspective regarding the development of the potato industry. A list of the key performance indicators appropriate to each of the six schemes examined in the report are therefore outlined. The following indicators, *inter alia,* could be considered appropriate to the schemes in the potato sector.

Table 111: Performance Indicators for Potato Programmes

Scheme	Indicators
Registration and Standards	• No inspection carried out • Cost of inspections and cost efficiency • No breaches of Regulations • No prosecutions • No Participants in Bord Glas Quality programme • Results of external audits
Plant Health Controls	• No inspections/samples • Cost of Inspections/sampling and cost efficiency • Incidence of plant diseases • Results of external audits
Grant Assistance	• Level of grants awarded • Number and type of project assisted • Returns on investments of individual projects • Overall performance of the sector and sub-sectors – value of output, exports, imports etc • Costs of administering the schemes
Variety Evaluation	• No varieties evaluated • Uptake of varieties in seed production and ware production in Ireland and in GB and Northern Ireland • % of costs recovered from charges
Tops Centre	• outputs from centre • costs of outputs
Seed Certification	• Area and quantity of seed certified • Cost of scheme and fee income • Quantity and value of seed exports and imports
Plant Breeders Rights	• Income from scheme • Cost of operating scheme

ANNEX 1 - Bibliography

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Annex 2 - No of potato growers and area by County

	1992		1994		1996		1998		2000		2002	
	No of Growers	Area	No of Growers	Area	No of Growers	Area	No of Growers	Area	No of Growers	Area	No of Growers	Area
Ulster	436		430		348		258		178		138	
Donegal		2481		1948		1986		1693		1396		1395
Monaghan	35	98	29	65	30	66	25	39	8	12	4	8
Cavan	17	66	12	40	5	27	5	19	3	12	2	8
Total	488	2645	471	2028	383	2079	288	1751	189	1420	144	1411
Connacht												
Galway	50	129	57	131	48	130	42	130	34	127	31	118
Mayo	8	35	7	46	9	60	10	89	8	51	5	33
Sligo	20	54	8	11	18	63	15	70	15	73	12	62
Leitrim	-	-	-	-	-	-	-	-	-	-	-	-
Roscommon	16	30	15	30	13	20	12	33	4	13	6	16
Total	94	248	87	218	88	273	79	322	61	264	54	229
Munster												
Clare	21	61	12	33	9	30	15	34	16	24	10	28
Cork	282	2064	282	2046	247	1974	180	1288	137	1079	120	1168
Tipperary	57	291	42	264	57	307	48	284	38	277	32	333
Waterford	20	113	24	161	39	158	22	102	16	89	14	99
Kerry	28	138	16	106	20	170	19	172	15	156	11	138
Limerick	14	113	17	123	26	159	8	65	5	32	3	30
Total	422	2780	393	2733	398	2798	292	1945	227	1657	190	1796
Leinster												
Dublin	150	2700	149	2553	147	2691	117	2448	86	2065	74	2019
Kildare	35	262	34	230	42	328	31	335	27	284	23	305
Offaly	66	185	62	240	53	230	33	160	33	129	33	122
Westmeath	27	82	25	130	28	55	17	55	14	40	13	57
Meath	96	3924	89	4616	88	5557	74	5259	59	3938	54	3960
Carlow	14	181	16	169	23	165	17	152	9	135	9	141
Wexford	105	885	114	969	163	998	116	731	103	769	91	839
Laois	27	95	46	92	18	66	14	68	17	68	13	46
Wicklow	37	514	50	488	38	369	33	310	28	281	30	263
Longford	4	4	-	-	-	-	-	-	-	-	-	-
Louth	147	1235	142	1575	140	1911	110	1780	70	1652	64	1736
Kilkenny	64	779	46	639	59	647	42	518	33	470	40	506
Total	772	10846	773	11701	799	13017	604	11816	479	9831	444	9994
Overall Total	1776	16,519	1724	16,680	1668	18,167	1263	15,834	956	13,172	832	13,430

ANNEX 3 - Breakdown of Seed Growers and Area by County

	1992		1994		1996		1998		2000		2002	
	No of Growers	Area	No of Growers	Area	No of Growers	Area	No of Growers	Area	No of Growers	Area	No of Growers	Area
Ulster												
Donegal	491	1,700.3	429	1,558.3	345	1450.8	202	1068.61	126	762.52	110	635.96
Monaghan	4	10.8	3	5.64	3	17.1	1	4.0	3	5.0	2	4.0
Cavan	0	0	0	0	0	0	0	0	0	0	0	0
Total	495	1711.1	432	1,564	348	1467.9	203	1072.61	129	767.52	112	639.96
Connacht												
Galway	28	46.30	28	42.50	23	67.8	13	43.4	14	25.7	12	36.6
Mayo	10	17.60	5	31.67	4	59.51	8	82.57	5	41.5	4	5.2
Sligo	11	14.50	7	7.80	4	5.0	2	4.0	1	27.9	1	14.6
Leitrim	0	0	0	0	0	0	0	0	0	0	0	0
Roscommon	13	15.90	8	9.90	6	7.6	3	1.7	4	4.6	3	3.2
Total	62	94.30	48	91.87	37	139.91	26	131.47	24	99.7	20	59.6
Munster												
Clare	2	1.2	1	1.80	1	1.6	1	2.0	1	1.2	1	2.0
Cork	50	137.50	44	264.70	42	347.9	51	272.4	41	226.1	34	151.6
Tipperary	8	16.90	1	1.0	3	16.6	2	52.4	4	43.0	6	64.4
Waterford	0	0	0	0	0	0	1	10.4	2	5.6	4	20.5
Kerry	15	8.8	5	4.80	3	35.4	3	27.0	3	25.0	2	9.0
Limerick	2	2.60	4	14.00	17	58.39	0	0	0	0	0	0
Total	77	167.00	55	286.30	70	459.89	58	344.2	51	300.9	47	247.5
Leinster												
Dublin	4	27.20	3	10.00	4	70.0	4	14.0	1	31.0	0	0
Kildare	8	56.60	8	59.80	5	27.0	6	22.6	3	19.1	2	9.0
Offaly	16	38.50	15	63.65	13	67.2	11	48.0	13	54.3	10	36.4
Westmeath	4	9.50	5	11.80	3	5.8	4	8.2	2	2.2	3	4.2
Meath	9	170.70	3	78.00	6	57.0	4	54.0	3	33.0	2	25.0
Carlow	6	41.60	4	35.60	4	69	4	68.3	3	19.2	3	24.2
Wexford	41	148.60	29	97.50	37	1701	18	80.6	18	95.9	17	94.6
Laois	2	8.00	1	1.90	2	3.2	3	7.6	4	7.8	3	3.6
Wicklow	13	74.00	5	8.40	8	21.1	5	18.1	4	12.7	4	9.8
Longford	3	0.60	1	0.3	0	0	0	0	0	0	0	0
Louth	22	214.80	19	399.74	12	376	13	294.51	11	309.7	17	341.3
Kilkenny	4	89.30	6	136.00	6	66.1	3	55.5	3	27.5	5	40.5
Total	132	879.40	99	902.69	100	934.05	75	671.41	65	612.42	65	590.64
Overall Total	766	2,851.8	634	2,844.9	555	3001.75	362	2219.69	269	1780.54	244	1537

ANNEX 4 - Breakdown of Ware Potato Varieties Grown by County (1992 and 2002)

Variety	Rooster (Ha's)		Pinks (Ha's)		Records (Ha's)		Golden Wonder (Ha's)		British Queens (Ha's)	
Year	**1992**	**2002**	**1992**	**2002**	**1992**	**2002**	**1992**	**2002**	**1992**	**2002**
Carlow	8	115	31	2	31	-	50	21	13	2
Cavan	-	3	48	4	19	-	-	-	-	1
Clare	-	2	28	10	19	11	0.40	-	7	3
Cork	2	127	1,002	597	106	-	439	123	118	170
Donegal	59	407	854	667	666	52	42	27	117	57
Dublin	6	827	227	146	354	27	7	12	1,115	505
Galway	-	15	17	12	83	80	0.81	1	13	9
Kerry	-	22	90	70	0.40	10	13	4	11	23
Kildare	4	177	34	23	170	72	5	14	35	15
Kilkenny	19	169	172	98	184	24	244	106	58	66
Laois	-	4	0.81	1	74	30	3	5	3	5
Leitrim	-	-	-	-	-	-	-	-	-	-
Limerick	-	8	66	11	5	1	26	4	11	5
Longford	-	-	3	-	0.81	-	0.81	-	-	-
Louth	13	558	752	665	125	17	8	7	103	183
Mayo	-	6	13	4	13	20	-	-	5	1
Meath	14	1,305	778	722	1,867	247	57	59	184	103
Monaghan	-	-	84	6	4	-	1	-	4	1
Offaly	-	26	11	-	86	64	34	12	21	14
Roscommon	-	4	4	3	16	6	3	1	6	2
Sligo	-	11	45	50	-	1	-	-	6	-
Tipperary	2	67	38	37	133	149	58	43	16	23
Waterford	-	31	37	38	-	-	21	10	29	13
Westmeath	-	13	12	1	55	34	9	8	1	2
Wexford	-	192	250	149	36	7	116	149	148	200
Wicklow	3	87	168	54	19	1	11	6	146	68
Totals	**130**	**4,177**	**4,765**	**3,371**	**4,066**	**854**	**1,149**	**613**	**2,170**	**1,470**

ANNEX 5 - DAF Staff assigned to Potato Schemes and other Schemes in 2002

			Scheme							Total Potatoes		Total Other	
Scheme	Grade	Number of Staff	R .& S. (MWU)	P.H. (MWU)	Grants (MWU)	Tops (MWU)	Seed Certif-ication (MWU)	P.B.R. (MWU)	P.V.E. (MWU)	(MWU)	% of Total	(MWU)	% of Total
Plant Health & Registration / Food Standards	SI	1	0.1	0.02						0.12	12%	0.88	88%
	AI	1	0.11	0.1	0.03					0.24	24%	0.76	76%
	AS	1	0.11	0.11	0.05					0.27	27%	0.73	73%
	AAI	4		0.12	0.2					0.32	8%	3.68	92%
	SAO	13	1.43	1.43						2.86	22%	10.14	78%
Total:		**20**	**1.75**	**1.78**	**0.28**					**3.81**	**19%**	**16.19**	**81%**
Potato Variety Evaluation Programme	SI	1							0.03	0.03	3%	0.97	97%
	AI	1							0.75	0.75	75%	0.25	25%
	AAI	1							0.3	0.3	30%	0.7	70%
	TAO	1							0.9	0.9	90%	0.1	10%
	Ind. Grade	6							0.25	0.25	4%	5.75	96%
Total:		**10**							**2.23**	**2.23**	**22%**	**7.77**	**78%**
Seed Certification	SI	1					0.1	0.02		0.12	12%	0.88	88%
	AI	3				1.0	0.12	0.07		1.19	40%	1.81	60%
	AS	1					0.3			0.3	30%	0.7	70%
	AAI	2				1.0	0.25			1.25	63%	0.75	63%
	DS	8				2.0	6.0			8.0	100%	0	
	SSA	1				1.0				1.0	100%	0	
	SA	1				1.0				1.0	100%	0	
	TAO	21				1.0	17.16			18.16	86%	2.84	14%
	CO	1				1.0				1.0	100%	0	
	Ind. Grade	4				4.0				4.0	100%	0	
Total:		**43**				**12.0**	**23.93**	**0.09**		**36.02**	**84%**	**6.98**	**16%**
Crop Production & Safety Division	PO	1	0.02	0.01	0.01	0.02	0.02		0.02	0.10	10%	0.9	90%
	AP	1	0.1	0.04	0.04	0.1	0.1		0.02	0.4	40%	0.6	60%
	HEO	1	0.06	0.04	0.04	0.06	0.06		0.02	0.28	28%	0.72	72%
	EO	1	0.15	0.025	0.025	0.3	0.45		0.05	1.0	100%	0	
	CO	1	0.15	0.025	0.025	0.3	0.45		0.05	1.0	100%	0	
Total:		**5**	**0.48**	**0.14**	**0.14**	**0.78**	**1.08**		**0.16**	**2.78**	**56%**	**2.22**	**44%**

ANNEX 6 - Evaluation List Of Recommended Maincrop Potato Varieties 2002

Yield and Quality Characteristics
(Trial Results, 1998-2001)

	Kerr's Pink	Rooster	Saturna	Maris Piper	Cara*	Hermes
Marketable yield (t/ha)	37.3	48.3	32.9	39.2	55.8	45.2
% of controls**	**87**	**113**	**77**	**92**	**112**	**106**
Dry matter %	23.4	22.2	23.6	21.7	19.0	22.1
Eating quality	7.8	7.3	7.2	7.0	6.4	7.1
Disintegration on cooking	4	3	2	4	2	3
24 hr discolouration	9	9	9	9	8	7
Crisp colour	5.3	5.4	5.4	4.1	4.4	5.8

ANNEX 7 - Quantities of Pre- basic seed sown in 2001 to produce FSI seed

Grower ID	Variety	Tonnes of Pre-basic planted	Area certified as FS 1	Area downgraded
A	King Edward	1.05	Ware	0
	Pentland Dell	1.95	Ware	0
B	Duke of York	0.85	0.2	0
C	Home Guard	2.40	0.6	0
D	Rooster	4.2	1.1	0
	Cara	1.54	0.4	0
	Shannon	0.10	Discontinued	0
	Druid	1.35	0.35	0
	Malin	1.28	0	0.34
	Avondale	1.20	0.1	0
	Colleen	1.15	0.28	0
	Orla	2.18	0.64	0
E	Kerrs Pink	2	0.8	0
	Golden Wonder	1	0	0.4
F	Home Guard	1.6	0.4	0.5
G	Kerrs Pink	1.3	0.4	0
	Record	1.05	0.4	0
	British Queen	1.7	0.6	0
	Desiree	0.6	Discontinued	0
	Estima	0.75	0	0.2 Discontinued
	Home Guard	0.5	0	0.2
	Golden Wonder	1	0.35	0
	Maris Piper	1.65	0.6	0
	King Edward	0.76	0.2	Discontinued
H	Record	1.1	0.4	0
	Kerrs Pink	1	0.4	0
	British Queen	1.35	0	0.5
	Lady Rosetta	0.20	0.2	0
I	Record	1.1	0.4	0
J	Kerrs Pink	0.6	0	0.6
K	Kerrs Pink	2.0	0.8	0
	British Queen	2.1	0.6	0
	Golden Wonder	2.05	0.8	0.8
	Maris Piper	1.7	0.2	0
L	Saturna	2.3	0.8	0
M	British Queen	3.05	0.6	0
N	Pimpernel	1.1	0	0.6
	Champion	0.13	0	0.1
O	Record	1.65	1	0
P	Pentalnd Ivory	0.95	0.30	0
Q	Arran Victory	0.25	0.1	0
R	Dunbar Rover	0.43	0.2	0
S	Kerrs Pink	0.6	0.2	0
Tonnes of Pre-basic Sealed		**56.82**		
Area Certified and Area Downgraded			**14.02**	**4.04***

*sold from Tops for ware

ANNEX 8 - Production and planting of Pre-Basic Seed 1999- 2001

Variety	***Pre-basic 1 seed produced In 1999*** ***Tonnes***	***Prebasic 2 seed produced in 2000*** ***Tonnes***	***Pre-Basic 2 seed sold for to Foundation stock growers in 2001*** ***Tonnes***	***Quantity of prebasic 2 seed eligible for FS class in 2001*** ***Tonnes***	***Quantity of Pre-basic 2 seed downgraded in 2001*** ***Tonnes***	***Quantity of pre-basic 2 seed discarded/used for ware etc*** ***Tonnes.***
Arran Victory			0.25	0.25		
Avondale			1.20	1.20		
British Queen		9.0	8.20	6.85	1.35	
Cara			1.54	1.54		
Champion			0.13		0.13	
Colleen			1.15	1.15		
Desiree			0.60			0.6
Druid			1.35	1.35		
Duke of York			0.85	0.85		
Dunbar Rover			0.43	0.43		
Estima			0.75			0.75
Golden Wonder		6.5	4.05	1.0	3.05	
Home Guard		4.75	4.50	2.4	2.1	
Kerrs Pink		10.25	7.50	7.5		
King Edward			1.81	0.76		1.05
Lady Rosetta		0.25	0.20	0.2		
Malin			1.28		1.28	
Maris Piper		3.8	3.35	3.35		
Orla			2.18	2.18		
Pentland Dell		2.5	1.95			1.95
Pentland Ivory			0.95	0.95		
Pimpernel			1.10		1.1	
Record		5.0	4.90	4.90		
Rooster			4.20	4.2		
Saturna		3.25	2.30	2.30		
Shannon			0.10*			
Total	**8.0**	**80.0**	**56.82**	**43.36**	**9.01**	**4.45**

ANNEX 9

Foundation Seed Production from Pre-Basic Seed Planted in 2001

Variety	***Pre-Basic 2 seed sown 2001***	***Classification of crop harvested in 2001*** ***FSI Sealed*** ***Other Sealed***	***Classification Of crop harvested in 2002 FS II (sealed)***	***2002 FS II (unsealed-as dug)***	***2002 Other (sealed)***	***Marketing*** ***Tonnes***
Arran Victory	0.25	0			4	0
Avondale	1.20	7				7 FS I discarded
British Queen	8.20	20.4	63	150	80 SE I	
Cara	1.54	0			45 E	45 E exported (IPM)
Champion	0.13	0				
Colleen	1.15	6.0	24			
Desiree	0.60	5				5 FS I discarded
Druid	1.35	0.5			44 E	44 E exported (IPM)
Duke of York	0.85	0			5 E	
Dunbar Rover	0.43	0			12 E	
Estima	0.75	3.5 (SE I)				3.5 SE I discarded
Golden Wonder	4.05	0			24 SE I	
Home Guard	4.50	20 5.0 (SE I) 5.0 (E)		5		
Kerrs Pink	7.50	0	24	388		
King Edward	1.81	0		38		38 FS 2 discarded
Lady Rosetta	0.20	0	6.5	16.5		
Malin	1.28	0 8.0 (E)				
Maris Piper	3.35	0	24	76		
Orla	2.18	3.83			8.5 SE I	
Pentland Dell	1.95					1.95 PB 2 sold for ware production from Tops
Pentland Ivory	0.95	0			1 SE I	
Pimpernel	1.10	0			6 SE I	
Record	4.90	2	73.7	140		
Rooster	4.20	0	136.5	52		
Saturna	2.30	13.85			96 SE I	
Shannon	0.10	0				0.1 PB2 discarded pre planting
Total	**56.82**	**78.58** **21.5**	**351.5**	**865.5***	**321.5**	**144.55**

***Estimated 'as dug' figure**

ANNEX 10

Crop Inspection Standards under the Seed Certification scheme

CLASS	OFFTYPES & VARIETAL IMPURITIES	TOBACCO VEINAL NECROSIS	LEAF ROLL & SEVERE MOSAIC			MILD MOSAIC VIRUSES	BLACKLEG
			PVY	LEAF ROLL	OTHER		
FOUNDATION 1	0	0	0	0	0	0	0
FOUNDATION 2		0	0	0	0	0	0
SUPER ELITE 1	10	0	0	0	0	10	50
SUPER ELITE 2	10	0	0	0	0	10	50
SUPER ELITE 3	10	0	0	0	0	10	50
ELITE	10	20					100
		100					
CLASS H & CLASS X	20	50					100
		100					

ANNEX 11

Classification of Certified Seed Sown in 2002 by Variety and Area (Hectares)

Variety	Foundation (EEC1)		Super Elite (EEC2)			Elite (EEC2)	Class H (EEC3)	Totals
	Year 1	Year 2	Year 1 (SE1)	Year 2 (SE2)	Year 3 (SE3)			
Arran Victory	0.10			0.20		0.10		**0.40**
British Queen	0.90	11.05	18.30	26.05	6.70	38.10		**101.10**
Cara		2.20	0.10		17.75	40.80		**60.85**
Catriona				0.10		0.30		**0.40**
Champion					0.20			**0.20**
Colleen		1.60	0.30					**1.90**
Desiree						0.75		**0.75**
Druid		2.10						**2.10**
Duke of York			0.40	0.20		0.35	0.20	**1.15**
Dunbar Rover						0.80		**0.80**
Golden Wonder	0.96		5.80	8.00	13.00	79.10	11.70	**118.56**
Home Guard	1.00	0.20	5.70	1.15	1.20	9.50		**18.75**
Irene				0.20		0.40		**0.60**
Kerr's Pink	0.50	23.30	77.75	187.90	173.10	254.75	6.70	**724.00**
King Edward		1.80						**1.80**
Lady Rosetta		1.60		13.30	27.40	2.40		**44.70**
Maris Piper	0.70	3.10	5.30	9.20	5.90	21.80		**46.00**
Orla	0.30	0.11	0.40			1.20		**2.01**
Pentland Ivory			1.00					**1.00**
Pimpernel					1.00			**1.00**
Record	2.10	3.00	14.45	37.60	61.10	50.20	2.40	**170.85**
Rooster	0.80	6.55	27.20	67.99	34.45	78.79		**215.78**
Sante						0.65		**0.65**
Saturna	0.80	4.00		17.30	1.00			**23.10**
Sharpe's Express						0.40		**0.40**
Up to Date	0.20							**0.20**
Totals	**8.36**	**60.61**	**156.70**	**369.19**	**342.8**	**580.39**	**21.00**	**1,539.05**