The role of field inspection in seed certification

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ABSTRACT. The New Zealand Seed Certification Scheme has operated for almost 50 years, 12 as a member of the OECD Herbage and Oil Seed Scheme. The objective is to ensure that seed of high cultivar purity is available to the grower having regard to the criteria laid down for the inspection of seed crops. These include the origin of the seed, paddock history. isolation, a field inspection of the growing crop at the optimum time for the detection of contamination with other cultivars and species and certain specific diseases and weeds.

Key *words:* New Zealand. seed certification, field inspection.

INTRODUCTION

The theme of this conference is the production of herbage seed, its research and practice, so I will confine this paper to herbage seed only and the role certification has to play in its production. I am pleased that the committee responsible for organizing the programme has arranged a session which includes reference to certification and the recognition of its importance to the production and quality standards of herbage seed generally. I think that to a certain extent certification has been taken for granted and its importance to the seed industry overlooked.

Perhaps this could be taken as a compliment to people such as J. W. Hadfield and J. H. Claridge, of the then Department of Agriculture, for initiating the scheme back in the late 1920s, and as evidence of the fact that it has operated effectively with all people concerned, with the seed industry having a part to play.

BACKGROUND

The original objective was to establish an organization which would ensure the distribution of grass and clover seed of superior stram, and to stimulate the wider domestic use and greater production of these seeds. At the same time the Department of Agriculture wished to foster an export trade by uniformly classifying the various seed lines (Hadfield, 1929).

Prior to the establishment of a certification scheme there was wide variation in seed lines being sold, particularly in the case of perennial ryegrass (*Lolium perenne* L.). Many of these lines were heavily contaminated with annual and Italian types (*Lolium multiflorum* Lam.) so that pastures did not persist (Levy and Davies, 1929). The scheme was introduced in the 1929-30 season and covered areas of perennial ryegrass and white clover (*Trifolium repens* L.) . The following year the scheme was extended to cover cocksfoot (*Dactylis glomerata* L.) , red clover (*Trifolium pratense* L.) and Italian ryegrass. Areas were selected having regard to age, origin of the seed and the determination of strain as assessed by a sample trial grown by the then Plant Research Station at Palmerston North.

In the case of perennial ryegrass the scheme applied to the strain which had evolved naturally in the Hawke's Bay and Poverty Bay regions. Inspections were carried out when the crop was in ear to check for the presence of awning, and the results compared with a similar inspection carried out on an area sown with a trial sample. Initially, with white clover it was necessary only to register the area. provided it was more than 4 years old. In the 1931-2 season this was changed and certification was based on the result of a plot test, the criterion being type, not age.

Since the scheme was first introduced as a means of protecting the consumer, manv other countries have enacted legislation establishing standards of seed puritv and germination. The New Zealand scheme still operates on a purely voluntary basis and there are no Acts or regulations governing its operation. The use of certified seed is not compulsory, and the

standing instructions which govern the scheme are regularly amended and updated to meet changing conditions. The scheme aims at providing the consumer with seed of high cultivar and physical purity after having satisfactorily met the standards laid down for the inspection of crops. For herbage cultivars to be eligible for certification, they must be shown by official evaluation to have reached an acceptable level of performance and be of value to New Zealand farming.

INTERNATIONAL SCHEMES

When in 1967 New Zealand joined the OECD Herbage and Oil Seed Scheme, our own certification system, was such that only minor changes were necessary to enable us to conform to the rules laid down. New Zealand has since joined two further OECD schemes which include beet and cereal seed. The aim of these seed schemes is to facilitate international trade, and so there are many advantages in membership for countries like New Zealand which sell large quantities of seed overseas. Not only do other member countries recognize the scheme and accept our seed, but it also allows New Zealand to multiply overseas seed for re-export.

Traditionally, the majority of our seed exports have been to European countries, particularly the United Kingdom, France, Germany and Ireland. In order that our certified seed may have continued access to these countries. the methods by which we certify our seed have to be acceptable to the EEC. As the result of a recent visit by the EEC Seeds Commission, reciprocity has now been achieved.

NEW ZEALAND SEED CERTIFICATION SCHEME

Certification in New Zealand takes into account the following criteria:

(1) Origin of the seed — The seed must be of an origin that makes it eligible for further certification.

(2) Paddock history — Certain time intervals must be observed between seed crops of different species and different cultivars of the same species. For grasses there must be a time interval of two harvest seasons, and for herbage legumes three harvest seasons. However, successive crops of the same cultivar and certification class may be sown on the same area without any time interval.

(3) Isolation — Minimum isolation distances must be observed between cross-pollinating species. For areas 2 ha or less, 200 m isolation is required, and for areas larger than 2 ha, 100 m.

(4) Freedom from specific diseases and certain specified weeds; e.g., areas of prairie grass (*Bromus willdenowii* Kunth.) are rejected if found to contain head smut (*Ustilago bullata* Berk.) at field inspection. Also, any area containing nodding thistle (*Carduus nutans* L.) is rejected, and in the case of wild oats (*Avena fatua* L.), herbage grasses are reduced in class to 1st Generation.

(5) Purity of the resultant crop as determined by laboratory examination on an officially drawn sample.

The breeder of any cultivar eligible for certification is responsible for maintaining adequate supplies of basic seed to meet commercial requirements; so there is a flow of seed coming from the breeder or his agent being multiplied through the grades at all times. Basic seed is intended for further multiplication to produce 1st Generation, which is the main trading grade, and most of the seed exported is of this class.

All herbage cultivars within the scheme are inspected at least once during the growing season, and in some cases twice. The first inspection is generally the main one when the most emphasis is on assessing the cultivar purity. If it is necessary to carry out a further inspection, this is generally to check on isolation and for the presence of specified weeds, such as wild oats or nodding thistle. Where it is considered that an area can be rogued satisfactorily the grower may be given this opportunity, which necessitates a further inspection.

Prior to about 5 years ago, field inspections of herbage crops, with the exception of the red clovers, were concentrated in the period when flowering was taking place, generally late November-December. This meant that a considerable area had to be covered in a relatively short period of time. It had been felt for

some time that field inspections carried out at this time were not always satisfactory, and although it suited the inspection of perennial ryegrass it was difficult to assess any likely contamination in annual and short-rotation ryegrasses and cocksfoot. The relative emergence and flowering dates for the main cultivars of ryegrass vary and it was considered that field inspections should have more regard to this fact. Not only did this allow for a more accurate assessment of contamination to be made, but it also helped to spread the work load on the officers responsible for carrying out the field inspections.

RYEGRASSES

'Grasslands Ruanui' perennial ryegrass is the first to emerge in late spring, followed closely by 'Grasslands Nui' perennial ryegrass and 'Grasslands Ariki' ryegrass. 'Grasslands Tama' Westerwolds ryegrass, 'Grasslands Manawa' shot-rotation ryegrass, (*Lolium* x *hybridum* Hausskn.) and 'Grasslands Paroa' Italian ryegrass emerge as a group about 10 to 12 days later. In order to'gain further information it was decided that the later flowering annual and short-rotation types be inspected at an earlier stage. For example, Tama ryegrass was looked at in early spring when it was considered that diploid types would be recognized more easily by their growth habit. Farmers were asked to co-operate by closing areas of Tama and Ruanui rvegrass that they intended saving for seed, for a short period only, in early spring. An attempt was then made to determine if it was practical to inspect areas at this stage. Approximately 100 areas of Ruanui and Tama were inspected, and as a result it was established that a satisfactory inspection of Tama could be carried out, but not of Ruanui. Although some contamination, where it did exist, was observed in Ruanui, difficulty was experienced with self-sown cereals growing in the crop, as in many cases permanent pasture is sown following a cereal. Therefore, in the case of Ruanui, it was considered that the present method of inspection at flowering time gave the most accurate assessment of contamination. At this stage the later flowering types tend to be taller and more upright and are readily distinguishable, but the reverse is not the case when trying to determine perennial ryegrass contamination in seed crops of, say, Manawa and Paroa.

In Tama, most of the contamination observed was found where paddocks had been fairly hard grazed at the time of inspection. In many instances the contamination appeared to be the result of insufficient cultivation where old existing plants of perennial types were still present between the rows. These would have been much more difficult to pick up at a later stage, and it was generally felt that it was practical to inspect Tama without the necessity of closing paddocks to stock. A similar experience was found with cocksfoot seed areas, where although many remain ungrazed throughout the year, contamination with ryegrass is more easily seen at an early stage.

Short-rotation and Italian types are best inspected in November while they are still in a leafy stage. At this time the emerging inflorescences of most of the perennial types under certification in New Zealand may be readily observed.

CLOVERS

Red clover inspections are carried out early in spring when they are just starting to make growth. Provided growing conditions are satisfactory, differences in growth habit can be detected and inspections are based on this: e.g., 'Grasslands Hamua' is earlier than both 'Grasslands Turoa' and 'Grasslands Pawera'. In Canterbury, although growing conditions are not always suitable for red clover inspections, few errors are subsequently picked up when seed lines are plot-tested at Palmerston North, where differences are relatively easily recognized. With the three red clovers plus the two white clover cultivars 'Grasslands Huia' and 'Grasslands Pitau' now eligible for certification, difficulties can be experienced in distinguishing different cultivars within each species under field conditions.

Added to this is the problem of contamination of areas by hard seed. Additional new clover cultivars such as Pitau white clover and Pawera red clover coming under certification have made the problem of finding suitable

TABLE I: AREAS OF HERBAGE SEED CROPS ENTERED FOR CERTIFICATION, 1975-6 — 1978-9 (HECTARES)

	1975-6	1976-7	1977-8	1978-Y
Clovers	25 590	24 740	25 849	28 679
Ryegrasses	13 460	18 731	17752	17 891
Cocksfoot Dogstail Lotus Lucerne Prairie grass Timothy	4 903	4 343	4 876	5 254
Totals	43 953	47 814	48 477	51 824

areas for the multiplication of pure seed much more difficult. In an effort to overcome this problem, areas proposed for breeders' seed are soil sampled and an assessment of the degree of contamination with buried seed is made. This, combined with the paddock history, the confirmed origin of the seed, and a field inspection backed up with plot tests, covers the certification of these areas.

CONCLUSION

In conclusion, an indication of the scope of the herbage scheme may be of interest. The average area entered over the past 5 years is approximately 48 000 ha, the majority of the seed being produced in Canterbury.

As for the future there is no doubt that we will be required to certify many more cultivars — not only those bred in New Zealand, but also overseas cultivars for multiplication and re-export. This year there is approximately 500 ha, including cereals, in this category.

As I indicated earlier. everybody concerned with the industry, be they the grower. the breeder, the merchant or the MAF, has a part to play in the continued efficient running of what is a purely voluntary scheme. The fact that this co-operation continues is an endorsement of the original scheme as conceived by its initiators.

REFERENCES

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