SEED CERTIFICATION

N. L. SHILLITO

Department of Agriculture, Christchurch

SEED CERTIFICATION may be described as having three main functions:

- (1) Maintaining a plant type substantially the same as the original selection made by the plant breeder.
- (2) The maintenance of adequate supplies of good quality seed for pasture maintenance and renewal.
- (3) The identification of individual lines of seed and their classification according to a set of standards.

The main criteria used by the New Zealand scheme are the origin of the seed used to sow the area and a field inspection during the growing period. In addition, each line of seed is tested for purity and germination and, as a further check on quality, laboratory and plot tests are carried out where applicable.

For practical commercial purposes, certification provides a reliable basis for trading. If a line of seed meets certification standards, it can be bought and sold in the knowledge that it will be substantially the same as any other line in the same certification class. These standards are now generally accepted and form the basis of both internal and export trading.

What additional uses a certification scheme may be put to, depends on what policy the particular authority concerned adopts in drafting its regulations. Diseases of various kinds can have a very serious effect on the quality and yields of crops and most certification schemes make provision for the rejection of crops of lines of seed which show more than a stated level of infection with certain seed-borne diseases.

Provision can also be made for the rejection of lines which contain certain weed seeds or for a maximum acceptable level of contamination for others.

In the New Zealand scheme, only limited attention has been given to the presence of weeds in certified lines of seed and, in general, standards relate to the total weed content without specifying any particular weed. Table 1 sets out minimum purities and maximum permissible weed contents for the various certification classes and types of seed.

There appears to be a growing awareness of the value of seed certification in the control of certain weeds which are considered to have economic importance. For the last two seasons, growers of certified seed have been told that the presence of nodding thistle (*Carduus nutans*) at field inspection will result in the rejection of the area. The response to this regulation has been most gratifying and only 33 areas were rejected because of nodding thistle in the 1968-9 season.

This implies that a considerable measure of weed control could be obtained if similar conditions were imposed for other serious weeds. However, should the regulations for freedom from weeds be made too stringent, there is always a danger that some growers would be discouraged from growing certified seed. This would defeat the objects of

TABLE 1: MINIMUM PURITY STANDARDS

<i>Kind of Seed</i>	<i>Class</i>	<i>Minimum Purity</i>	<i>Remarks</i>
'Grasslands Ariki' ryegrass	Pedigree & Mother	98%	➤ 0.5% weeds and 1% other crops.
	Standard	97%	➤ 1% weeds and 1% other crops.
Barley	Pedigree & Mother	98%	➤ 0.1% other cereals.
	Standard	98%	➤ 0.3% other cereals.
'Grasslands Hamua' broad red clover	Pedigree & Mother	98%	➤ 0.5% weeds and 1% other crops.
	Standard	97%	➤ 1% weeds and 1% other crops.
Browntop	Certified	97%	
'Grasslands Apanui' cocksfoot	Pedigree & Mother	80%	➤ 1% weeds and 3% other crops including a maximum of 0.5% ryegrass.
	Standard & P.P.	80%	➤ 2% weeds and 3% other crops.
'Grasslands Paroa' Italian ryegrass	Pedigree & Mother	98%	➤ 0.5% weeds and 1% other crops.
	Standard	97%	➤ 1% weeds and 1% other crops.
'Wairau' & 'Chanticleer' lucerne	Pedigree & Mother	98%	➤ 0.5% weeds and 1% other crops including a maximum of 0.5% red clover.
	Standard	98%	➤ 0.5% weeds and 1% other crops.
'Grasslands Turoa' Montgomery red clover	Pedigree & Mother	98%	➤ 0.5% weeds and 1% other crops.
	Standard	97%	➤ 1% weeds and 1% other crops.
Oats	Pedigree & Mother	98%	➤ 0.1% other cereals.
	Standard	98%	➤ 0.3% other cereals.
'Grasslands Ruanui' perennial ryegrass	Pedigree & Mother	98%	➤ 0.5% weeds and 1% other crops.
	Standard	97%	➤ 1% weeds and 1% other crops.
N.Z. perennial ryegrass	Permanent Pastures	97%	➤ 1% weeds and 1% other crops.
Ryecorn	Pedigree & Mother	98%	➤ 0.1% other cereals.
	Standard	98%	➤ 0.3% other cereals.

TABLE 1 — *contd*

<i>Kind of Seed</i>	<i>Class</i>	<i>Minimum Purity</i>	<i>Remarks</i>
'Grasslands Manawa' short-rotation ryegrass	Pedigree & Mother	98%	➤ 0.5% weeds and 1% other crops.
	Standard	97%	➤ 1% weeds and 1% other crops.
'Grasslands Kahu' timothy	Pedigree & Mother	98%	➤ 0.5% weeds and 1% other crops.
	Standard	96%	➤ 1% weeds.
Subterranean clover	Certified	95%	
Wheat	Pedigree & Mother	98%	➤ 0.1% other cereal.
	Standard	98%	➤ 0.3% other cereal.
'Grasslands Huia' white clover	Pedigree & Mother	97%	➤ 0.5% weeds and 1% other crops, other than suckling clover.
	Standard	93%	➤ 1% weeds and 1% other crops, other than suckling clover.
N.Z. white clover Brassica species	Permanent Pastures	93%	➤ 1% weeds and 1% other crops, other than suckling clover.
		99%	

the scheme and must be avoided at all costs. It would be possible to draw up very precise regulations governing the presence of individual weed seeds in certified lines but this would require careful consideration.

I have been asked to deal with the effect of seed certification regulations on the producer. Under existing conditions, the grower of certified seed can obtain seed for sowing in several different ways. First, he can apply for breeders' seed from the Department of Agriculture. Secondly, he can buy certified seed of any other grade except second generation which is not eligible for re-entry. Thirdly, he can retain his own seed and use it to sow areas which will be eligible for entry into certification at the appropriate grade. It must be realized, however, that seed retained will drop a grade at each successive sowing.

In the first category is the man who wants to produce seed of the highest quality — the specialist seed producer. The breeders' seed he obtains is the first increase of nucleus material from the plant breeder. This grower has no selection of lines to choose from as all seed from a cultivar distributed each year is put into a blend and thus has a common origin. Therefore, it is most important that the Department takes every precaution to ensure that breeders' seed is of the highest possible standard.

The Department has recently been criticized for the presence of undesirable weed seeds in lines of breeders' seed. This is fair enough. The Department accepts responsibility for the standard of this seed and admits that the criticism, in some cases at least, was well warranted.

However it is only fair to point out that the Department is only the agent in the production of breeders' seed and relies on the skill and knowledge of growers and seed processors. This being so, some of the responsibility for impurities must rest with the grower and the merchant responsible for machine dressing. The grower, therefore, must make every effort to grow the crop on ground which does not contain seeds of undesirable weeds and prepare it for sowing so as to eliminate germinating seedlings. Maximum weed control should be aimed at in the growing crop by grazing management and chemical sprays. Harvesting machinery should be thoroughly cleaned down before threshing the crop. Growers must aim at producing clean seed in the paddock. They are paid a substantial bonus for contract-grown seed and have an obligation to make a special effort to produce seed of the highest quality. Machine-dressing operations must also aim at the highest possible purity — not just slightly above the minimum acceptable standard.

In 1969, amendments were made to the agreement covering the growing of contract seed and the Department hopes that this will improve the position. Seed can now be rejected in the terms of the agreement if it contains the following weed seeds:

Nassella tussock (*Nassella trichotoma*), rawgwort (*Senecio jacobaea*), ox-eye daisy (*Chrysanthemum leucanthemum*), hoary cress (*Cardaria draba*), *Carduus* spp., *Rumex* spp. other than sheep's sorrel, *Hordeum* spp. and storksbill (*Erodium cicutarium*). The Department can now also refuse to take delivery of any line on which the total weed seed content exceeds 0.2% and lines of white clover which contain more than 0.1% of suckling clover (*Trifolium dubium*) or more than a trace of sheep's sorrel (*Rumex acetosella*). These new conditions, it is hoped, will lessen the chances of undesirable weed seeds occurring in lines of breeders' seeds.

In the selection of contract growers, checks are now being made on the standard of seed they have produced in commercial certification over the last few years. A grower can acquire a reputation as a top seed producer on the basis of consistently high yields. His purity standards, however, may not be satisfactory for breeders' seed.

It is hoped to establish closer liaison with firms carrying out the machine dressing of contract-grown lines. The Department must make sure that those concerned with the production of breeders' seed realize its importance in the success of the scheme as a whole.

If these measures are successful, a better product can be expected for release as breeders' seed. This, in turn, should make it possible for the top growers to market high quality lines in the basic class. The next consideration must be the buyer in the second category who tags basic or first generation seed for further multiplication. In most cases, this class of buyer has a choice of lines and can select the one which best meets his requirements. It cannot be over-emphasized that the buyer of seed should always examine the P. and G. (Purity and Germination) certificate. This is particularly important where it is intended for further seed production. The fact that the line has passed certification does not necessarily mean that it is entirely satisfactory for sowing seed areas. It is not practical under the current system to have the standards of commercial certification so high that a large number of lines would be rejected for impurities which do not affect their suitability for use in sowing pasture. No attempt will be made to list all the weeds which should be avoided. In many cases this will be largely a matter of opinion but most growers undoubtedly have a fairly clear idea of what weeds they consider undesirable.

At present, therefore, a seed producer must himself select the best line available according to his requirements.

Several types of growers can be included in the third category. One may have a farm which by good management has been kept virtually weed-free. Rather than risk introducing new weed seeds on to the property, the owner prefers to use seed of his own growing. If he wishes to sell surplus seed, he has to start off with a certified line and retain its identity through certification or accept a lower price for uncertified seed. If he decides on the former, then he must from time to time replace his seed as it will automatically be degraded after each resowing, and so ultimately become ineligible for re-entry. There are, however, two exceptions to this general rule. Both white clover and perennial ryegrass are eligible for entry into laboratory certification indefinitely and if successful will be classified "Permanent Pasture". Obviously, however, the grower who retains his own seed restricts his production to the lower grades and this type of seed production can be recommended only in special circumstances.

Another type of grower in this class might have a large area of light land not particularly suitable for seed production but prefer to grow his own seed requirements. He would probably purchase a small quantity of high grade seed and use the produce of this to sow areas intended for grazing.

As a general principle, however, the growers of herbage seed in New Zealand purchase certified seed which they sow and enter for certification with the object of producing certified seed for sale either for further multiplication in the case of the higher grades or for pasture renewal in the lower grades.

To summarize: Whether we realize it or not, and although the certification scheme is sometimes accused of not paying sufficient attention to them, weeds do in fact have a very definite influence on the outlook of most herbage seed producers.

The elimination of weeds from lines of certified seed is a very desirable object. Just how practical complete freedom is, is not certain. Undoubtedly, some weed seeds are most undesirable as contaminants and a special campaign aimed at these individually might be the answer.

Whatever the decision regarding certification, seed growers have an obligation to the farming community as a whole to do their utmost to produce weed-free seed.

However, this in many cases is not practical unless methods of control can be established. This organization can contribute substantially by emphasizing the need for more research on this subject. Seed production has become a back number in the allocation of research effort, and this session should do much to develop an awareness of the urgent need for work to be carried out on many aspects of herbage seed growing.