WEED SEEDS IN AGRICULTURAL SEEDS: A SEED PRODUCER'S VIEWPOINT

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Summary

The main weed problem in herbage seed production is the ingress of injurious grass weeds in grass seed production and impurities like suckling clover (*Trifolium dubium*) and sorrel (*Rumex acetosella*) in clover seed production. The only means of control is by good husbandry methods which are detailed. Chemical weed control has largely solved other weed problems with some exceptions. Increasing infestation of wild oats (*Avena* spp.) is a serious problem on arable land. Generally speaking, present purity standards and field inspection standards are satisfactory. More research is needed into many aspects of herbage seed production. There are good prospects for the expansion of herbage seed exports if the scientist, the farmer and the seed merchant work together to endeavour to hold the cost of seed production.

INTRODUCTION

NEW ZEALAND has basically a grassland economy. By far the major proportion of our export trade consists of animal products produced from grass.

The herbage seed industry is a valuable industry, supplying practically all domestic requirements as well as exporting seeds to the value of approximately \$3 million annually.

There are good prospects for expanding this export trade but seed quality and low production costs are important factors in achieving this expansion. In the past too little attention has been paid to problems affecting herbage seed production and it is pleasing to note the recommendations of the Agriculture Committee of the National Development Conference that considerable expansion of research in this direction should be undertaken. The problem is a real one, as the economics of seed production have reached a stage where growing dirty or low-yielding crops just does not pay.

WHAT ARE THE MAIN PROBLEMS WHICH MAKE IT DIFFICULT TO PRODUCE CLEAN SEED?

(1) Ingress of undesirable species, particularly other grasses, in producing ryegrass, timothy and cocksfoot seed, suckling clover (*Trifolium dubium*) and sorrel (*Rumex acetosella*) in white clover seed. Goose grass (*Bromus mollis*), hair grass (*Vulpia* spp.), and Yorkshire fog (*Holcus lanatus*) are among the most common grass weeds.

Chemical weed control provides no answer to this problem. Good husbandry is the only means of control. Grass weeds constitute by far the greatest problem and this is highlighted by the fact that, after 100 years of seed growing, science has still to provide an answer. In fact, modern methods of harvesting only intensify the problem, as a large proportion

of seeds such as hair grass and Yorkshire fog are blown out the back of the combine harvester on to the paddock during harvesting operations.

(2) As seed-producing areas are mainly arable areas, build-up during the arable rotation of wild oats (*Avena fatua*) and weeds which are difficult to kill such as stinking mayweed (*Anthemus cotula*) rayless chamomile (*Matricaria matricarioides*) ox-eye daisy (*Chrysanthemum leucanthemum*) is also a problem.

(3) All other weeds are important but here the scientist has done an outstanding job and chemical methods of weed control have largely provided a satisfactory means of control.

(4) The main problem of the seed producer is a rising cost structure. Partly as a result of devaluation there has recently been a substantial rise in the cost of harvesting and cultivation machinery, and increases in certification, seed handling, labour, and transport costs.

Clean seed must be grown if New Zealand is to grow it cheaply enough to compete on highly competitive world markets. Skilful integration of seed production with intensive mixed farming is the best method of achieving this, and in such a system weed control is vital at every stage of the rotation.

WHAT MEASURES CAN SEED PRODUCERS ADOPT TO ENSURE THE PRODUCTION OF CLEANER SEED?

(1) Sow clean seed

A fundamental fact which bears repetition is that the easiest way to remove many impurities is never to sow them in the first place.

Very high purity standards are essential in the reproduction of nucleus seed. Hand roguing of areas producing breeders' seed is desirable.

It is possible that a substantial premium paid for very high purity or for such things as freedom from goose grass could give a producer an incentive to do this.

Arrangements for the reproduction of breeders' seed are probably satisfactory at present.

(2) Sow after a summer fallow

This is ideal but to a large degree impractical. In very dirty conditions, a full summer fallow may be necessary, but, in general, with present levels of intensification in mixed farming, a summer fallow tends to become an expensive luxury. However, short summer fallows are still practical in many instances.

As well as this, reasonably long fallows can be provided between arable crops in the course of a rotation by good management. These are necessary for control of couch grass (*Agropyron repens*) as well as other weeds.

The importance of timeliness of operation to ensure that these fallowing periods are provided cannot be overstressed.

(3) Grow a series of arable crops between seed crops

During these cultivations, many seeds of injurious species are destroyed. The only drawback is the intensification of the wild oat problem, and the build-up of weeds which are difficult to kill, such as stinking mayweed.

(4) Never allow seed-heads of injurious grasses to appear in the subsequent life of a seed stand

This is not easy, and involves good management and heavy stocking. The shorter the grass break and the longer the arable break, the easier this is to achieve.

If a crop of white clover is taken in the second year after a ryegrass seed crop, use of paraquat can both ensure higher seed yields and prevent seeding of weed grasses.

(5) Take full advantage of modern methods of chemical weed control

This is important, not only in the seed stand, but during the growing of the intervening arable crops.

Timing of application and correct technical advice are vital.

(6) Hand rogueing has a valuable place

Hand rogueing is well worth while in many instances if labour can be made available. Examples of this are the removal of isolated ryegrass plants from young cocksfoot seed stands, and removal of isolated dock (*Rumex* spp.) heads prior to harvesting ryegrass crops.

(7) Exercise care in threshing

It is important not to damage such seeds as goose grass which are difficult to remove by machine dressing if damaged.

The removal of any impurities during machine dressing always involves some loss of good seed. The more difficult the impurity is to remove, the greater the loss, resulting in a lower yield of seed per acre and a higher cost per unit of seed dressed.

(8) Spray fence lines, drain banks, and similar areas to prevent ingress of injurious species

(9) Spray irrigation supply races

Water is a spreading agency for weeds. Spraying of irrigation supply races bringing water to farms is a matter that should receive attention to prevent spread of weeds and injurious grasses in irrigation water.

(10) Exercise extreme care in feeding seed residues

This should be arranged so that these are fed only on areas reserved for the same type of seed production as the residue being fed.

(11) Arrange rotations

Arrange rotations so that risk of contamination of a herbage seed crop, from volunteer seed from a previous seed crop sown in the same paddock earlier in the rotation, is kept to an absolute minimum.

(12) Pay close attention to manurial practices to endeavour to combat such weeds as sorrel

WHAT MEASURES CAN BE TAKEN NATIONALLY TO ENSURE PRODUCTION OF CLEANER SEED?

Generally speaking, present standards seem to be satisfactory. It is of vital importance that such weeds as nodding thistle (*Carduus nutans*) are completely controlled to prevent their spread to hill country areas and marginal land where control would be very difficult or impossible.

Present arrangements for rejection at field inspection of crops containing nodding thistle should ensure that this is the case.

To prevent the spread of wild oats, crops of grain intended for seed multiplication should all be field inspected and rejected if they contain wild oats. Rejection of herbage seed crops at field inspection which contain wild oats is not practicable at present.

Continued research is needed into the chemical control of some weeds which are very difficult to kill.

Much more research is needed into many aspects of herbage seed production and it is to be hoped that this will be undertaken in the near future.

If we are to expand our exports of herbage seed on highly competitive world markets, concerted effort will have to be made by both the farmer and the seed merchant alike to hold the cost of seed production.