

SURVEY TO LOCATE WILD OAT FREE AREAS IN MID CANTERBURY

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Summary

Careful examination of all crops on a group of farms, expected from an earlier survey to have a low incidence of wild oats (*Avena fatua*), showed a higher than expected incidence (69%) of infested fields. However, clean fields were found and, of those infested, most (97%) had very few wild oat plants and could have been rogued effectively. In at least 42% of the infested fields, the evidence implicated the sown crop seed as the source of the invading plants. It also indicated that all barley and most wheat seed lines sown had contained cultivated oats as an impurity.

INTRODUCTION

Wild oat free grain and pasture seeds are essential in any programme to combat wild oats. This is recognised by various seed certification requirements, including in the case of cereals and some grasses, freedom from wild oats at field inspections. But, though these measures and seed dressing techniques currently used can reduce the level of wild oat seeds in seed lines below the limits of sensitivity of seed certification procedures, (Bould 1975), the only guarantee of absolute purity is to grow the seed in wild oat free paddocks and process it with "clean" equipment. The location of wild oat free areas or areas of minimal infestation is thus basic to any eradication project, as well as desirable in the interest of preventing further build up of the weed.

In the 1976/77 season wild oat survey (Saville *et al* 1979) conducted in the Ashburton County, no wild oats were found in the surveyed paddocks in 86 of the 156 surveyed farms. In addition six farms with crop were marked "no wild oats on property" by the surveyors but were not included in the survey analysis since specific field data was not obtained.

This group comprising 92 farms seemed a logical starting point to search for wild oat free fields and properties in Canterbury, and to obtain an initial estimate of their likely frequency in the County.

METHOD

Farms were visited during January and February 1979 when wild oat panicles had emerged and harvest, apart from ryegrass seed, had not started. Thirty farms out of the 92 were selected on the basis of Rural Delivery (RD) number groupings, five being taken at a time from the RD districts to be visited on a survey day. Farms with RD3 Ashburton addresses were excluded because of distance and shortage of time.

The present status of the previously surveyed fields and the location and immediate past history of presently cropped fields were discussed with the farmers of the selected farms before the crops were inspected.

Inspections were usually done by two people, though a few were

Crop Weeds

inspected by one person and on 2 days three people were involved. Widely spaced sweeps were taken across each field. If no wild oats were found during the initial sweep, search was intensified until it was considered, within the limits of time and manpower, that no wild oats were present. An intensive search took approximately one man-hour to cover 5 ha. When wild oats were found their location with respect to the drill row was noted, and infestations recorded as either being indigenous (wild oats between the drill rows), or assumed introduced with the crop seed (plants only in drill rows). An estimate was also made of the feasibility of roguing the field.

RESULTS

Results are set out in Table 1. Thirty farms were visited, 28 from the previous survey plus two of the "no wild out" farms. Of the previous survey farms, 13 had had two fields surveyed and 15, one field surveyed. Of the latter group 2 of the farms visited this time had no crop. In all 113 fields were inspected, 10 from the two "no wild oat farms" and 103 on 26 farms from the 1977 survey. Six barley crops were not sufficiently mature to be certain that wild oat panicles would not have appeared after the inspection and were omitted from the calculations.

Table 1. Wild oat status of farms and fields inspected in Ashburton County in 1979.

	Farms visit- ed	Fields in- cluded in analysis*	Fields no wild oats found	Fields with wild oats	Fields with wild oats in drill row only
Total	30	107	33	74	31
Not in 1977 survey	2	8	22	6	3
In 1977 survey	28	99	31	68	28
2 crops surveyed	13	53	17	36	14
1 crop surveyed	15	46	14	32	14

* six barley crops visited were omitted as not sufficiently advanced for reliable inspection.

Farms

Only four farms (14%) had crops (10 fields) in which no wild oats were found in any field. Of these four farms one had two crops of oats, making search difficult. The owners of this farm stated that wild oats had been found from time to time but careful roguing had been carried out for many years. Of the other three farms, though no wild oats were found, all fields in crop (7) contained cultivated oats as impurities growing mainly in the drill rows.

Fields

Of the 107 fields visited at near optimum time for inspection for wild oats 31% (33) were considered free of wild oats. If the 10 fields on

Crop Weeds

the four 'clean' farms are omitted, then on properties with some wild oats 24% of fields were clean.

Of infested fields 72 of 74 (97%) could have been hand rogued, in most instances being well below the accepted roguable limit of an average of 1 plant /10m².

The wild oats in 43 of the 74 fields (58%) were between the drill rows or in small, low density patches as well as in the rows and were thus assumed to have arisen mainly from seed already in the soil.

General

Of 23 farmers interviewed, 14 said that they carried out roguing. One employed a team of four people while one confessed to not having noticed the plants in time to prevent some of the seed falling. Three farmers were unable to recognize wild oats, one having some plants in all of six crops.

Cultivated oats were observed in all barley and wheat crops. The numbers in barley varied from a few plants /ha to an estimated 1/10m², while in wheat the numbers were also small. The oats were invariably in the crop row and varied from short compact paniced milling oats to taller, more open panicle feed-type oats resembling wild oats.

DISCUSSION

The more detailed inspection of fields on the properties surveyed in 1977 indicates that the original overall inspection underestimated the incidence of wild oats or that wild oats have increased. Then, no wild oats were recorded from 55% of farms with crop, compared with 14% in this inspection. The latter figure would give an estimate of 8% of farms in Ashburton County free of wild oats at present. For fields, the 1977 figures estimated 46% to be clean, compared with 31% for this inspection. The actual percentage free of the weed may be less as our inspection method suggests, reasonably enough, that the number of wild oat plants found in lightly infested fields is proportional to the time spent searching, (a point to be taken into account when developing a roguing programme from "clean" or lightly infested fields). However, since 98% of fields inspected were clean or roguable the inference is that at least 45% of arable fields in the County are clean or roguable.

The presence of wild oat plants only in the drill rows in many of the infested crops is alarming since it indicates that wild oats are being sown with the crop seed. Furthermore, by inference, the number of wild oat-free fields amongst cropped fields is being halved each season, i.e., of 64 fields with no wild oats at sowing, 31 are now infested. This could explain at least in part, the greater number of "clean" fields in the 1977 survey and indicates the need for urgency if an eradication programme is to be introduced.

The incidence of cultivated oats in the barley fields and to a lesser extent in wheat is a cause for concern on two counts. It makes roguing for wild oats more difficult, for, at the low levels of infestation envisaged when maintaining clean fields, no oat panicle could be neglected, even though some cultivated oat variety panicles are reasonably easy to distinguish from wild oats. Furthermore, it implies that present seed handling and certification methods leave something to be desired in terms of efficiency in relation to an eradication programme.

The survey does not give information on the dynamics of the wild oat infestations. Whether they increase or decrease is likely to depend on future management. If the fields are returned to pasture for a period, then the seed population in the soil will be reduced, and in any case the build up delayed. Attrition of soil seed reserves can be helped by growing green

Crop Weeds

feed crops and especially by using a non seed producing crop as the first crop after pasture. A longish grass phase passing to crop via turnips or green feed oats is in fact a feature of the rotations used on many of the farms visited. Furthermore a thorough roguing programme can reduce the population, a contention supported by evidence from three of the properties visited. However, a planned programme including the above features, clean seed and clean equipment will be necessary to prevent invasion of the clean fields and to prevent the lightly infested fields passing beyond roguable limits.

CONCLUSION

The numbers of wild oat free fields and fields with very low levels of wild oats in the Ashburton County are such that, if desired, wild oat free seed could be produced and processed as a basis for wild oat eradication programmes and the maintenance of wild oat free fields.

Eradication of wild oats by roguing would be feasible on most low intensity cropping properties. Since the number of infested fields appear to be increasing, delay in implementing programmes will increase the size of the problem to be tackled.

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