SOWING DATE AS AN APHID-VIRUS CONTROL TECHNIQUE

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Summary

Modern pest control practices suggest the use of natural controls wherever possible, since they are often efficient and usually costless to the grower. The manipulation of sowing date as a control measure for aphid-virus problems is discussed and it is shown to have application to autumn-sown wheat in New Zealand, and possibly to plantings of main-crop carrots. It does not normally have any application when a crop can be planted only in the face of increasing flights of aphids.

THERE are now known to be a number of undesirable side-effects involved in the use of chemical pesticides, and this has led to an emphasis on natural control of pests whenever this seems feasible. One of the suggested natural controls is to alter the established sowing date of crops so that the problem is avoided. This is not always possible agronomically, but, where it is, such a procedure can be efficient and is, of course, costless to the grower. It is a technique that is not applicable to all crops, or to all districts, since local practices are frequently based on many years of experience.

However, where an insect pest is attacking a crop which could be sown at a different time, it may be a very worthwhile approach to a pest problem.

Its application to aphid-virus problems in New Zealand is limited, since most crops are planted in the spring. An examination of aphid flight patterns (Lowe, 1967) shows that crop aphids fly regularly in high numbers from about mid-September to mid-December, and again during March, April and May. Spring-planted crops, such as potatoes, are emerging shortly before or as flights commence. During the spring flights they are young and succulent and make ideal hosts for flying aphids. It is for this reason almost certain that they will be infested, and the only possible hope of keeping them free of aphids appears to be the use of long-lasting insecticides which will continue to be effective during the first two or three months the plant is above ground. There is no possibility of altering the sowing date for such a crop.

Crops sown in the autumn, however, have the advantage that the flights begin to drop off in numbers from about the end of April. If the date of sowing the crop can be adjusted to a later period, then there is a chance of avoiding the problem altogether while the plant is in its young, susceptible stage.

The crop which lends itself in New Zealand to such a manipulation is that part of the wheat crop (about 65%) which is autumn-sown in the South Island. This is best illustrated by looking in detail at the flight pattern of the cereal aphid (*Rhopalosiphum padi* L.) (Fig. 1). In this figure, eight years of flights at Lincoln have been divided into three classes, depending on when the autumn flights ceased. In five of the

Fig. 1: Autumn flights of the cereal aphid at Lincoln grouped according to their time of cessation.

eight years, flights were practically over by the end of May. In two other years (1962–3) flights continued into the first half of June, while in 1966 there were some flights as late as early July.

For many farmers, especially those on the lighter wheat-growing soils of Canterbury, there seems to be no reason why late sowing of wheat cannot be practised, and for this reason the current recommendation for these growers is that they can avoid the problem of aphid infestation by sowing wheat after June 1. Such sowings will not emerge until June 15 to 20, by which time flights will be over in most years. This does not entirely dispose of the problem, but it is a costless procedure which will in most years be effective.

Such a recommendation is accompanied by the warning to growers that in an occasional circumstance it may not be effective, and so it will still be necessary for farmers to exercise vigilance and obtain competent advice on aphid control in order to keep barley yellow dwarf virus from reducing yield.

Another crop which may benefit from this type of technique is carrots. A widely-established belief in Canterbury is that main-crop carrots should not be sown before mid-December, as early planted crops are frequently stunted and unprofitable as a result of aphid infestation and infection with carrot motley dwarf virus. The flight patterns of the carrot aphid (*Cavariella aegopodii* Scop.) show that the reason for this contention is probably very sound, since high numbers of this aphid are on the wing in spring, and the flights are finished by December. Carrots sown mid-December emerge after flights are over and in the absence of aphids and virus make excellent autumn growth.

Most crops sown in the spring in New Zealand are not able to be manipulated in this way, as they either need the longer growing period obtained by spring planting (*e.g.* potatoes) or must be brought to harvest during the summer (*e.g.* barley). In these cases other measures—*e.g.*, chemicals—must be used to maintain control, or resistant crops planted where they are available (*e.g.*, brassicas).

REFERENCE

Lowe, A. D., 1967: *Proc. 20th N.Z. Weed & Pest Control Conf.*: 184.