FIELD USAGE OF INSECTICIDES FOR CONTROL OF PORINA CATERPILLAR

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Summary

A survey in Southland showed porina (*Wiseana* spp.) to be a pasture pest of major importance and it was regarded as having a direct bearing on determining stocking rates. From the survey, it was found that no action to control the pest was taken by any farmer until after pasture damage had become visibly apparent. When treatments were applied there was a strong preference for granular formulations. Results following treatment were overall regarded as satisfactory and property owners made an endeavour to assess performance on the basis of larval reduction and pasture response.

INTRODUCTION

FOLLOWING the introduction to the market of diazinon formulations for the control of porina (*Wiseana* spp.), a field survey was carried out in Southland to assess the conditions under which the products were used, what aspects motivated treatment, and what results were obtained from treatment of pastures. Twenty-five properties, all within a 40-mile radius of Invercargill, were visited. It is considered that the properties visited would be representative of the properties in the province using organophosphorus compounds for control of porina.

DESCRIPTION OF AREAS TREATED AND REASONS FOR TREATMENT

On the 25 properties visited there was in each case an awareness of the porina problem and a desire to avoid reduction of seasonal pasture production and/or permanent pasture damage. The areas treated in all cases were sown pastures which could be described as improved or highly improved and it is doubtful whether the capital value of any area treated would be less than £160 per acre. Most of the properties surveyed were smaller than 300 acres and farming practice could be regarded as an intensive operation. Stocking rates of treated areas in all cases exceeded three ewes per acre (winter ewe equivalents) and on 18 properties the stocking rate was five or more ewes per acre. The winter carrying capacity of the areas treated is shown in Table 1.

TABLE 1: WINTER CARRYING CAPACITY (EWES PER ACRE)

Ewes Per Acre					No. of Properties
1-3	.....	.....	.....	.....	2
4-6	.....	.....	.....	.....	15
>7	.....	.....	.....	.....	4
Not recorded	.....	.....	.....	.....	4

Porina was considered as a particularly serious problem as the pest actively feeds at the time of the year when feed is most needed. Stocking rates in this area are largely determined by the level of available feed during August and early September. As a result of its autumn and winter feeding activities, porina has been found to influence directly the availability of feed at the times mentioned.

Property owners were questioned as to the importance of grass-grub (*Costelytra zealandica*) and only three considered it was a problem of any importance. Property owners were most emphatic that porina was a problem of increasing importance and was more serious at the time of the survey than five years previously.

In all cases, farmers had taken soil samples and found larvae in the soil prior to deciding to treat with insecticides, but in one instance the farmer probably misidentified grass-grub as porina. With the exception of one farm, soil sampling was not carried out until severe pasture damage had been observed. The farmers' assessment of larval population is shown in Table 2. Table 3 indicates the month when porina damage was first noticed.

TABLE 2: ASSESSMENT OF LARVAL POPULATION

<i>Larvae Per Square Foot</i>	<i>No. of Properties</i>
0-5	3
6-10	5
11-20	7
>20	4
Not known	6

TABLE 3: INITIAL VISIBLE PASTURE DAMAGE

<i>Month</i>	<i>No. of Properties</i>
April	2
May	5
June	10
July	4
Not known	4

TREATMENT OF PASTURE

Having decided that insecticide treatment was justified, it was necessary for the farmer to decide what material and formulation should be used. From the properties surveyed, it was found that there was a strong preference for granulated formulations, and 23 of the 25 properties surveyed used a granular product. The preference for this formulation can be attributed to four basic reasons. First, there was a belief that spray materials were likely to fail under the wet conditions which prevailed in Southland last winter. Secondly, the granules could be applied by the farmer himself without employing a contractor. Thirdly, pastures in most cases were very wet and farmers were opposed to heavy spray tanks causing further pugging to pastures. Fourthly, where farmers had decided to apply material from the air, they considered they had no alternative but to use granules.

Methods used for applying materials are shown in Table 4.

TABLE 4: METHOD OF APPLICATION

<i>Method</i>	<i>No. of Properties</i>
Spinner type prill spreader	13
Plane	6
Box topdressers	2
Spray	3
Bulk topdressed	1
Not recorded	2

(Note: Several properties used more than one method of application.)

Spinner-type prill spreaders were the most common type of application equipment used and performance was regarded as satisfactory. The aircraft used were in all cases fitted with either a venturi spreading device or a rotary prill spreader. With the aerial applications, it was claimed an effective 36 ft swath width was obtained at a flying altitude of 70 ft.

Treatments were applied between the months of May and August as can be seen in Table 5. The size of larvae at treatment is shown in Table 6.

TABLE 5: MONTH OF TREATMENT

<i>Month</i>	<i>No. of Properties</i>
May	3
June	4
July	9
August	6
Not known	3

TABLE 6: LARVAL SIZE AT TREATMENT

<i>Length (in.)</i>	<i>No. of Properties</i>
½-1	3
1-1½	3
1½-2	2
>2	6
¼-4	5
Not known	6

ASSESSMENT OF PERFORMANCE

Seventeen of the 25 properties made a definite attempt to assess product performance. On an overall basis, performance was regarded as satisfactory. Of the 17 who assessed performance, 13 had definite evidence of caterpillars being dead on the ground surface following treatment. Of the four properties where dead larvae were not observed, it is known that in three cases the farmers did not return to the treated area and hence were not in a position to make observations in this respect. Rainfall after treatment appears to have been a significant factor in leading to large numbers of dead larvae on the surface. In some cases it was specifically stated that larvae were not found on the surface until after rain three or four days after treatment.

Of the 17 farms considered, 14 reported either a growth response or a cessation of pasture damage which they attributed to treatment. Only one farmer positively claimed there had been no pasture response but he considered he had obtained good control of larvae. No observations for pasture response were made on the other two properties, but dead larvae were found on the surface in both instances. All 17 farmers observed either dead larvae or growth response.

Ten of the 17 farmers made an assessment of the reduction in larval population by soil sampling and nine were satisfied with the result. The remaining farmer who made careful observations claimed a two-thirds reduction in population four weeks after treatment, but regarded this as unsatisfactory.

DISCUSSION

The property owners in all cases regarded porina as a most important factor in limiting farm productivity but few had attempted to cost the loss of production or damage to pastures caused by the pest. Considering that all the properties had previously experienced severe porina damage, it was surprising that all but one property owner waited until pasture damage was visibly apparent before resorting to soil sampling. Substantial pasture damage must already have been caused before recognition and this would have been even greater by the time that treatments were applied. This aspect is also confirmed by the farmers' assessment of larval size at the time treatments were applied. It can be assumed that a better return to the expenditure on insecticide would have been obtained if earlier recognition and treatment had been carried out.

Several properties found larvae to be widely variable in size and it is assumed that more than one species was present in these cases. The selection of an optimum time for treatment in such circumstances would be difficult.

The survey does not permit a comparison to be made between the performance of granular and spray formulations. However, under the rainfall conditions experienced last winter, there is probably wisdom in the selection of the granular product owing to its longer residual life under such conditions. This has been demonstrated in a number of instances where the surface kill of larvae was not apparent until rain had fallen several days after treatment application.

Farmers probably placed too much emphasis on assessing product performance on the basis of dead larvae found on the soil surface. This could be most misleading as the absence of larvae is not indicative of poor product performance. More emphasis needs to be placed on the assessment of performance in terms of pasture response and cessation of larval damage as these are the two determinants of product performance.

If farmers are to receive the maximum benefit from the use of insecticides for the control of porina, several aspects need to be stressed. Correct and early identification of the pest is necessary and this should be followed up with treatment while larvae are small and before appreciable pasture damage has occurred. The longer the treatment is delayed, the greater the feed consumed by the larvae, the more difficult they are to control, and the likelihood of a rapid pasture recovery diminishes with the onset of the winter.