FIELD EVALUATION OF BAITS FOR PORINA CONTROL

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SUMMARY

A kibble wheat bait which carried 4.5 ml fenitrothion/kg bait effectively controlled porina (*Wiseana* spp) (Lepidoptera:Hepialidae) when applied at 50 kg/ha (0.225 kg/ha fenitrothion) using a hand seed spreader in hill country. At two of three sites spring pasture responses greater than 50% were recorded on treated areas.

INTRODUCTION

The development of insecticidal baits for porina control in hill country has had a long history, beginning with the use of Paris Green on bran baits by Dumbleton and Dick (1941). This technique was superceded by the organochlorine insecticides after World War II. Kelsey (1965) experimented with DDT on a kibble wheat bait which was very effective but was not commercially developed as DDT dust mixed with superphosphate was a more convenient method of porina control.

Baits persist longer (Haack *et al* 1982) than spray or granules giving a major advantage for control of a pest that feeds only sporadically (Esson 1970). The research reported in this paper was designed to evaluate the effectiveness of kibble wheat baits for porina control in trials in hard hill country in the southern North Island.

METHODS

Bait formulation

Each kilogram of kibble wheat ($\approx$ 350 grains/g) was mixed with 2 ml vegetable oil and 4.5 ml fenitrothion. The baits were formulated in a concrete mixer in 20 kg lots.

Application

Ten 0.45 ha blocks were treated on steep slopes on three farms at Coonoor in southern Hawkes Bay by three people walking around the contour in parallel and with another person acting as marker, particularly checking overlap. Baits were applied at 50 kg/ha (0.225 kg fenitrothion/ha) using Cyclone hand seed sowers on 17.7.81.

Porina sampling

Porina burrows were counted under ten 30 cm x 30 cm boards (Savage and French 1981) per trial block before treating and again 1-8.9.81. Also, four 1 x 0.5 m areas per plot were left untreated. Porina populations in these plots were estimated by digging each one up at the same time as the second board counts were made.

Pasture response

On 30.9.81 on three sites ten, 0.25 m² pasture cages were placed on the treated area and 10 on adjacent non treated areas (see Table 1 for details of sites). The pasture in each cage was cut with hand shears and the cages placed on a new area after it was trimmed. Dates on which the pasture was cut are shown in Table 2.

RESULTS

Insecticidal effects

The percentage decline in porina numbers ranged from 42% to 83% (Table 1). The data from the control plots were all $\pm$ 5 porina/m² of the initial board sample thus it was assumed this indicated little natural mortality.

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TABLE 1: Initial and final porina populations and percent population decline for 10 sites treated with kibble wheat baits.

Site	Aspect	Initial Pop ⁿ /m ²	Final Pop ⁿ /m ²	% Decline
1*	NW	53	12	78
2	NW	18	3	83
3	NW	19	11	42
4	NW	32	9	72
5	NW	43	10	77
6	S	42	8	81
7*	W	30	9	67
8	W	27	9	67
9	E	52	17	68
10*	S	6.3	2.8	56

* Sites used for pasture measurements (see Table 2)

Pasture response

Three representative sites were used for this part of the project. Pasture production from the three sites is shown in Table 2. No production differences between treated and untreated sites were measured at site 7 although a visual difference was apparent. At site 1 substantial production increases occurred in both spring and summer. At site 10 a substantial production increase was found in spring.

TABLE 2: Comparison of dry matter production (kg/ha) $\pm$ standard errors from treated and untreated sites. Site numbers correspond to those in Table 1.

	Date cut	Untreated	Treated
Site 1	6.11.81	387 $\pm$ 56	1162 $\pm$ 80 **
	9.12.81	952 $\pm$ 96	1180 $\pm$ 80
	14.1.82	1228 $\pm$ 116	1620 $\pm$ 120*
Site 7	6.11.81	324 $\pm$ 60	363 $\pm$ 60
	9.1.82	2000 $\pm$ 192	1680 $\pm$ 120
	24.3.82	924 $\pm$ 36	1088 $\pm$ 68
Site 10	6.11.81	448 $\pm$ 56	720 $\pm$ 104**
	9.1.82	1360 $\pm$ 120	1680 $\pm$ 232

DISCUSSION

The level of control of porina achieved in this trial is compatible with the 70-80% control that can be expected with conventional insecticidal control methods (Haack *et al* 1982; Perrott 1966; Taylor 1970). The level of pasture response at two of the three sites in spring occurred soon after lambing and at a time of severe feed shortage. The lack of a statistically valid response at site 7 is difficult to explain. At the rate used in this research the cost of treatment, including aerial application would not differ significantly from the cost of conventional spray or granule application of fenitrothion at 1.0 kg/ha. However, since this research was begun, Haack *et al* (1982) have shown in small plot field trials that 30 kg/ha of 528 baits of wheat/g dwf treated with 4.3 g fenitrothion/kg provided effective control. Assuming that this lower rate is as effective as the rate used in this study for porina control in hill country aerial application of bait would cost \$22/ha (including the cost of the bait), compared to spraying costs of \$30/ha. This saving is significant when one considers the low profitability of pastoral

agriculture in the southern North Island hill country where porina is a consistent problem. Surface application of bait using the farmer's own equipment could be as low as \$10-11/ha if the cost of the farmer's time and machinery are ignored. These costs are based on a 1982 price of kibble wheat of \$0.325/kg.

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