SEED-HARVESTING ANT CONTROL IN THE CLONCURRY DISTRICT

Seed-harvesting ants of the genus *Iridomyrmex* represent a major problem in establishment of pastures of buffel grass (*Cenchrus ciliaris* L.) in many areas of Queensland. Associated problems concern soil pH and water, and nutrients available to the seed at germination.

Methods of seed treatment for pest control have been established in many countries, as have pelleting methods associated with improvement of moisture retention and nutrition of germinating seed. A trial was designed therefore to test the effectiveness of seed treatment, including pelleting, for control of seed-harvesting ants in the Cloncurry area. Basic treatments compared were sowing seed on ploughed land against unploughed land, pelleting with lime or basic superphosphate against no pelleting, and inclusion of lindane or aldrin in the seed treatment against no insecticide treatment.

The site selected was on "Granada" station, near Cloncurry, where facilities and assistance were provided by The Australian Estates Company Ltd. and the Station Manager (Mr. R. Scandrett).

An analysis of a composite soil sample from the area gave:

pH		7·1
Available P_2O_5		400 p.p.m.
Replaceable K		0·9 m-equiv. per 100 g
Morgan Test	NO_3 Nitrogen	Low
	NH_3 Nitrogen	Low
Texture		Light-brown sandy loam

The soils concerned were the deep, well-drained Dugald River alluvials, apparently suitable for buffel grass growth. There was no major slope in the trial area but occasional lower lying areas were indicated by local dominance by *Dichanthium* sp. The vegetation was an open savannah formation in which the major tree species were silver box (*Eucalyptus pruinosa* Schau.), bloodwood (*E. terminalis* F. Muell.), ghost gum (*E. papuana* F. Muell.), *Bauhinia cunninghamii* Benth., and mimosa bush (*Acacia farnesiana* Willd.). Ground species were dominated by *Aristida latifolia* Domin, with *Heteropogon contortus* (L.) Beauv. and *Chrysopogon fallax* S. T. Blake dominating small areas. Other grasses and herbs found in the area included *Dichanthium* sp., *Leptochloa digitata* (R.Br.) Domin, *Enneapogon avenaceus* (Lindl.) C. E. Hubbard, *Perotis rara* R.Br., *Tragus australianus* S. T. Blake, *Panicum majusculum* F. Muell. ex Benth., *Sporobolus* spp., *Iseilema* sp., and *Malvastrum spicatum* (L.) A. Gray. Isolated colonies of local buffel grass were present also.

The trial area measured 15 chains by 12 chains. Colonization strips 6 ft wide were pegged across the area at 1-chain intervals. A plot contained 3 chains of colonization strip, and the middle chain was used as datum area. Ploughing treatments were carried out immediately before planting with a chisel plough equipped with sweeps.

The seeding rate was 0·93 oz (approximately 9,200 seeds) per chain of colonization strip. For pelleting treatments, lime or basic superphosphate was applied to seed wetted with 0·25 per cent. detergent solution to give seed : fertilizer weight ratios of 1 : 6–7 and 1 : 5 respectively. Insecticide treatments with aldrin (10 per cent. active) or lindane (10 per cent. gamma isomer) as dispersible powders were applied directly to the seed or premixed with pelleting material at the rate of 1 part of insecticide to 40 parts of seed by weight.

Seed (Cloncurry strain, 31 per cent. germination) was hand-sown on January 29, 1960, and relevant rainfall records are given in Table 1.

TABLE 1

RAINFALL DURING PROGRESS OF TRIAL

Month	Dates and Amounts of Rain (in.)									
December, 1959	Date ..	18								
	Rainfall	1·69								
January, 1960 ..	Date ..	10	11	12	13	25	26	27	28	29
	Rainfall	·25	·62	·68	·88	·71	·98	·15	·10	(Planting)
February, 1960 ..	Date ..	9	10	11	19	20	21	22	23	24
	Rainfall	·09	2·03	1·02	1·69	·11	·70	·02	·73	·11
March, 1960 ..	Date ..	17	18	28						
	Rainfall	·31	·16	(Assessment)						

At assessment, regrowth from old stools of *Chrysopogon fallax, Heteropogon contortus,* and *Aristida latifolia* was common on ploughed plots, as were the native annuals *Perotis rara* and *Dactyloctenium radulans* (R.Br.) Beauv. Isolated plants of naturally occurring buffel grass were present in or near the plot. Results of the assessment are presented in Table 2.

Under the conditions of the trial, field establishment did not exceed 20 per cent. of viable seed. Though apparently low, such establishment will provide satisfactory buffel grass stands.

Concurrent with field work, germination tests on a different batch of seed were made in the laboratory and nursery, and results are given in Table 3. Laboratory germinations are means of 2 tests of 200 seeds each, and nursery germinations are means of 3 replications of 200 seeds per plot planted as a randomized block layout.

TABLE 2

SEEDLING ESTABLISHMENT OF BUFFEL GRASS PELLETED WITH BASIC SUPERPHOSPHATE OR LIME, AND ALDRIN OR LINDANE

Cultural Treatment	Pelleting Material	Insecticide	Buffel Grass Seedlings per Chain of Colonization Strip			
			Block 1	Block 2	Block 3	Mean
Unploughed	Nil	Nil	0	0	0	0
	Lime	Nil	8*	20*	0	—
	Basic superphosphate	Nil	0	0	0	0
	Nil	Aldrin	0	0	0	0
	Lime	Aldrin	1	1	0	1
	Basic superphosphate	Aldrin	4	28*	1	11
	Nil	Lindane	0	0	1	0
	Lime	Lindane	196*	0	0	—
	Basic superphosphate	Lindane	0	0	1	0
Ploughed	Nil	Nil	1	5*	5	—
	Lime	Nil	33*	38*	51	—
	Basic superphosphate	Nil	62	2	57	40
	Nil	Aldrin	276	166*	353	314
	Lime	Aldrin	814	729	203	582
	Basic superphosphate	Aldrin	404	74	35	171
	Nil	Lindane	6*	1	22*	—
	Lime	Lindane	680	488	209	459
	Basic superphosphate	Lindane	509*	534	411	472

* Naturally occurring buffel grass in or near the plot.

TABLE 3

LABORATORY AND NURSERY GERMINATION OF BUFFEL GRASS, CLONCURRY STRAIN

Pelleting Material	Insecticide	Laboratory Germination (%) (Tested 10 days after treatment)			Nursery Germination (%) (Planted 28 days after treatment ; counted 51 days after treatment)
		Water	KNO_3	Days	
Nil	Nil	56	57	21	61
Lime	Nil	0	0	21	21
Basic superphosphate	Nil	1	4	21	23
Nil	Aldrin	17	14	21	31
Lime	Aldrin	0	0	21	20
Basic superphosphate	Aldrin	1	3	17	33
Nil	Lindane	6	2	21	50
Lime	Lindane	0	0	21	18
Basic superphosphate	Lindane	4	2	21	23
Kaolin	Aldrin	1	1	21	47
Kaolin	Lindane	3	3	21	37

Germination of lindane-treated seed is abnormal under laboratory conditions and may be slower, but where such seed is planted in the field, establishment is affected less seriously. Aldrin does not cause visible abnormality.

In summary, primary establishment of buffel grass was satisfactory in treatments including ploughing and pelleting with inclusion of insecticide. As a standard control measure is desirable for both low and high available phosphate areas, a recommendation has been made that all buffel grass seed planted in areas in which seed-harvesting ants are active should be pelleted with basic superphosphate and lindane (Champ and Sillar 1961).

REFERENCE

CHAMP, B. R., and SILLAR, D. I. (1961).—Seed harvesting ant control for buffel grass. *Qd Agric. J.* (In press).

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