QUEENSLAND DEPARTMENT OF PRIMARY INDUSTRIES

DIVISION OF PLANT INDUSTRY BULLETIN No. 755

CONTROL OF JASSIDS (F. CICADELLIDAE) ON POTATOES IN SOUTHERN QUEENSLAND

P. D. ROSSITER

SUMMARY

A granular, systemic insecticide, disulfoton, applied in the planting furrow and four insecticides applied as foliar sprays were tested for efficacy in controlling jassids, principally *Austroasca terraereginae* (Paoli), on potatoes. The most satisfactory pest reductions were obtained when the disulfoton application (2 240 g ha^{-1} a.c.) was followed by DDT spraying. Azinphos ethyl and maldison sprays were ineffective.

Yield differences among treatments were not obtained.

I. INTRODUCTION

A number of jassids species, including *Austroasca terraereginae* (Paoli) and *Austroasca viridigrisea* (Paoli), are commonly associated with potatoes grown in the major production area of southern Queensland, the Lockyer Valley. Insecticidal control is usually not considered to be warranted except during the seedling stage. However, these pests appeared to be more prevalent on the eastern Darling Downs where the growing of potatoes, principally for seed production, has been studied in recent years. For this reason, a trial was designed to investigate control of jassids with spray and granular insecticides at Westbrook during the summer of 1967.

II. MATERIALS AND METHODS

A 9 x 3 randomized block layout, including two check treatments, was employed in an area of Sebago variety potatoes planted on 15 September 1967. Each plot comprised three rows 91 cm apart and 12 m long. There was an untreated guard row between adjacent plots.

The following insecticides were used—

maldison (0·1% spray)—an emulsifiable concentrate containing 103% w/v active constituent.

61826—A

azinphos ethyl (0·05% spray)—an emulsifiable concentrate containing 40% w/v active constituent.

demeton-S-methyl (0·05% spray)—an emulsifiable concentrate containing 25% w/v active constituent.

DDT (0·1% spray)—an emulsifiable concentrate containing 25% w/v p p' DDT.

disulfoton (2 240 g ha^{-1} a.c.)—a granular formulation containing 5% w/v active constituent.

Further details of treatments are given with the tabulated results.

The granular insecticide was spread by hand into the planting furrow. The spray treatments were applied to run-off by knapsack spray unit at fortnightly intervals between 18 October and 12 December.

Jassid populations

A sweep net was used to obtain estimates of jassid populations. Thirty sweeps (10 per row) were made over each plot, before the application of spray treatments on 16 October and 1, 15 and 28 November.

Numbers of jassids were recorded. Most specimens captured were adult and constituted an invading population from surrounding weeds.

Leaf injury ratings

A leaf at each of five uniform positions was examined on each of 20 random plants per plot on 11 December. The positions represented stages in seasonal growth, from old mature leaves at the base of the plant to young leaves near the terminal. Each leaf was rated within the following categories—

0—no injury.

1—a few injury spots only.

2—injury spots noticeable, widely spaced over the leaf or concentrated on a small section of the leaf.

3—numerous injury spots closely spaced over most of the leaf surface.

4—as 3 and with some spots coalesced to give a higher degree of injury.

Ratings were summed for a plot figure of injury for each leaf position.

III. RESULTS AND DISCUSSION

Most specimens collected were identified as *Austroasca terraereginae* (Paoli). A summary of *A. terraereginae* population data is presented in table 1 and plant injury ratings are summarized in table 2.

No significant yield differences were recorded in this trial.

Most satisfactory suppression of *A. terraereginae* populations was achieved with the treatment consisting of a preplant soil application or disulfoton followed by foliar spray applications of DDT. Reasonably good control was achieved with the disulfoton treatment alone or with DDT or demeton-S-methyl sprays.

Azinphos ethyl and maldison sprays were less effective than other treatments. The success of the combined azinphos ethyl and DDT sprays must therefore be attributed to DDT.

61826—B

TABLE 1

NUMBERS OF *A. terraereginae* PER PLOT SAMPLE

Treatment	16 Oct 67		1 Nov 67		15 Nov 67		28 Nov 67	
	Trans. Mean*	Equiv. Mean**	Trans. Mean*	Equiv. Mean**	Trans. Mean*	Equiv. Mean**	Trans. Mean*	Equiv. Mean**
Check (mean of 2)	1·10	11·7	1·50	30·8	1·94	85·8	2·04	108·1
maldison (0·1%)	0·74	4·5	1·34	20·7	1·81	63·3	1·88	75·2
azinphos ethyl (0·05%)	0·98	8·6	1·49	30·0	1·79	60·5	1·84	67·8
demeton-S-methyl (0·05%)	0·89	6·8	1·57	36·2	1·39	23·4	1·48	29·5
DDT (0·1%)	0·75	4·6	1·37	22·6	1·49	29·7	1·46	27·7
azinphos ethyl (0·05%) + DDT (0·1%)	1·03	9·8	1·46	27·9	1·43	26·0	1·44	26·3
disulfoton (2 240 g ha^{-1})	0·46	1·9	0·46	1·9	1·19	14·5	1·37	22·6
disulfoton (2 240 g ha^{-1}) + DDT (0·1%)	0·53	2·4	0·56	2·6	0·99	8·7	1·12	12·3
Necessary differences for significance								
Between treatments 5%	0·52	..	0·31	..	0·33	..	0·27	..
1%	0·72	..	0·43	..	0·45	..	0·37	..
Treat. V check 5%	0·45	..	0·27	..	0·28	..	0·23	..
1%	0·62	..	0·37	..	0·39	..	0·32	..

* log (x + 1) transformation. ** Anti-transformed values.

TABLE 2

MEAN PLOT LEAF INJURY RATINGS

Treatment	Leaf Position					
	Upper	Upper-mid	Mid	Lower-mid	Lower	Treat. Mean
Check (mean of 2)	31·17	33·67	37·50	41·83	43·50	37·53
maldison (0·1%)	16·00	17·00	24·00	26·00	28·33	22·27
azinphos ethyl (0·05%)	17·00	21·67	20·67	23·33	25·00	21·53
demeton-S-methyl (0·05%)	5·00	9·00	7·33	11·67	16·00	9·80
DDT (0·1%)	9·33	9·33	8·00	11·67	14·67	10·60
azinphos ethyl (0·05%) + DDT (0·1%)	4·00	4·67	9·00	13·33	16·00	9·40
disulfoton (2 240 g ha^{-1})	11·00	17·00	14·67	15·67	13·33	14·33
disulfoton (2 240 g ha^{-1}) +DDT (0·1%)	5·33	8·00	7·00	8·67	7·67	7·33
Position Mean	14·44	17·11	18·41	21·56	23·11	..
Necessary differences for significance				5%	1%	
Between treatments Means	..	..	..	5·43	7·45	..
Treatment V Check Means	..	..	..	4·70	6·46	..
Between positions Means	..	..	..	1·87	2·48	..
Between positions within treatments	..	..	..	5·60	7·44	..
Between positions within check	..	..	..	3·96	5·26	..

Leaf injury data indicate that damage was most severe on lower leaves and progressively less severe towards the upper leaves. This suggests that jassids feed on all available leaves and the severity of damage is related to the time of exposure to infestation during crop growth. This trend of jassid activity was evident in all treatments except those where disulfoton granules were applied. In these treatments the damage was fairly evenly distributed over the plant indicating an equal exposure time resulting from the loss of efficacy of the treatment with time.

However, the leaf injury assessed in the disulfoton only treatment was slightly higher than expected. This can be explained by the increasing jassid activity in this treatment during the 2 weeks between final jassid counts and injury assessments while the spray treatments continued to exert control. Otherwise, the two sets of data agreed reasonably well regarding the relative efficacies of treatments.

As there were no significant differences among yields following the various treatments, it may be assumed that jassid populations encountered in this trial did not reach an economic level.

IV. CONCLUSIONS

Jassid control in potatoes may be obtained when necessary by the use of disulfoton granules at 2 240 g ha^{-1} a.c. applied in the planting furrow and supplemented with foliar spray applications of an effective insecticide.

Tuber production, however, does not appear to be affected by jassid activity at the relatively high population levels encountered, so the use of specific control measures would rarely be necessary.

(Received for publication 2 December 1976)

The author is an officer of Entomology Branch, Department of Primary Industries, and is stationed at Toowoomba.