Vol. XVI (1-2), 1979

EFFICIENCY OF SEVIN-COMBINATIONS AGAINST MAIZE JASSID (*ZYGINA* SP.) AND SHOOTFLY (*ATHERIGONA* SP.) ON SPRING MAIZE CROP

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Three insecticides viz., thiodan, phosvel and nuvacron were applied separately as foliar spray at 0.5 lb. (a.i.) added with 1.0 lb. (a.i.) of sevin, per acre. The first application was made 6 weeks after planting and the second application 10 days later. All insecticidal combinations effectively controlled the maize shootfly and jassid but sevin+thiodan gave the best control of the pest insects, followed by sevin+phosvel and sevin+nuvacron, in order of merit.

INTRODUCTION

Maize (*Zea mays* L.), the world's third ranking food crop, after wheat and rice, is annually grown over an area of about 1.56 million acres in Pakistan. It is a short duration crop with high yielding potential and provides good return to the growers with comparatively less effort and investment. Besides supplementing the protein requirements in human diet, it serves as an important source of fodder for cattle. Its grain is extensively used for livestock feed and as industrial raw-material for preparing glucose, cooking oil, etc.

The spring maize crop suffers heavily due to attack of pest insects, more particularly the maize jassid (*Zygina* sp.) and shootfly (*Atherigona* sp.). Rao (1923) and Ritchie (1925) reported that the shootfly larvae produce 'dead-hearts', inflicting sizeable loss to crop grain yield. Cramer (1967) reported an average loss of 10 per cent due to insect pests in the field. Ansari (1975) claimed that 6.36 per cent maize borer infestation and a population of 9.0 jassids per maize plant incurred a combined loss of 2.41 maunds per acre in grain yield. Efforts in the past with some success have been made to control the maize jassid and shootfly using some chemical insecticides. Reynolds *et al.* (1957) showed that the population of southern garden leaf hopper (*Empoasca solana* Del.) was reduced by 66 per cent with the application of 10.0 lb. thimet per 25 lb. of seed. Subsequently, Reynolds *et al.* (1960) reported that phorate and di-syston granules,

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applied topically on leaves, gave excellent and persistent reduction of *E. solana* on the seedling stage of sugar beet. Haq and Rasul (1966) applied endrin at 0.25 lb. (a.i.) per acre on sorghum crop against sorghum jassid and obtained 90.6 per cent mortality, 24 hours after the application. Haq and Ulfat (1966) used dimecron at 0.25 lb. and 0.5 lb. (a.i.) per acre on wheat crop against *Zygina* sp. and obtained 92.80 and 90.70, and 96.36 and 92.73 per cent mortality, 24 and 48 hours after the application, respectively. Subsequently, Haq and Ulfat (1967) obtained 92.19 and 86.50 per cent mortality of *Zygina* sp. with dimecron applied at 0.5 lb. (a.i.) per acre, 24 and 48 hours after the application, respectively. However, the mortality percentage with endrin when used at 0.5 lb. (a.i.) per acre was 89.85 and 82.88 per cent, 24 and 48 hours after spray on wheat crop, respectively. Akram (1970) tried endrin and dimecron in spray formulations while, thimet and di-syston in granular form on maize crop against *Zygina* sp. Thimet applied at 2.0 to 2.5 lbs. (a.i.) per acre proved to be the best, followed by di-syston, dimecron and endrin, in order of merit. Atwal and Singh (1970) in field tests against cotton jassid recorded highest mortality with sevin, applied at 0.2 per cent. Makhdoomi and Rasul (1973) tested efficacy of some chlorinated hydrocarbons against shootfly larvae.

MATERIALS AND METHODS

The crop was sown on February 27, 1976, in a randomized block design in 20 sub-plots, each measuring 50 × 15 feet and having 6 rows of plants 2½ feet apart. Each sub-plot was repeated with an in-between buffer space of 5 feet. There were four treatments, including a check, and five replications. Three insecticides viz., thiodan 35 per cent EC, phosvel 27 per cent EC and nuvacron 40 per cent EC, each applied at 0.5 (a.i.) in combination with 1.0 lb. (a.i.) of sevin per acre as foliar spray. Two applications were made; first at 6 weeks after planting, and the second 10 days after.

Observations on jassid population were recorded 24 hours before, 72 and 96 hours after each application, by sweeping each sub-plot twice with the help of a hand net. Shootfly infestation was recorded by counting the dead-hearts from 5 maize plants selected at random from each sub-plot, 24 hours before and 72 and 96 hours after each treatment. The data thus obtained were subjected to statistical analysis.

RESULTS AND DISCUSSION

The effectiveness of sevin-combinations on the populations of shootfly and jassid on spring maize is given in the tables below:

Table 1(A). *Effectiveness of sevin-combinations against maize shootfly and jassid.*

Insecticides	Average larval population of shootfly per plant 24 hours before treatment	Average jassid population per sweep 24 hours before treatment	*Per cent mortality. Hours after application*			
			72		96	
			Shoot-fly	Jassid	Shoot-fly	Jassid
1st application						
Sevin + Thiodan	1.20	53.90	56.66	98.58	49.50	97.48
Sevin + Phosvel	1.50	54.90	49.66	93.23	44.66	92.49
Sevin + Nuvacron	1.28	57.00	39.81	87.94	46.33	85.68
2nd application						
Sevin + Thiodan	1.00	23.80	68.66	91.90	66.66	91.92
Sevin + Phosvel	0.80	28.60	43.66	89.29	50.66	88.77
Sevin + Nuvacron	1.20	27.30	43.33	86.34	43.33	84.90

Table 1(B). *Pest Mortality* (Mean values in Degrees)

Insecticides	Shootfly	Jassid
Sevin + Thiodan	52.72	77.75
Sevin + Phosvel	43.20	72.87
Sevin + Nuvacron	40.99	68.82
First application	43.65	75.13
Second application	47.61	71.03
72 hours after spray	45.06	73.60
96 hours after spray	45.67	72.56

The above tables indicate that both the first and second applications gave effective control of maize shootfly and jassid. The mortality of shootfly and jassid with sevin+thiodan, sevin+phosvel and sevin+nuvacron was 56.66 and 98.58, 49.66 and 93.23 and 39.81 and 87.94 per cent, respectively, at 72 hours after the first application and 68.66 and 91.90, 43.66 and 89.29 and 43.33 and 86.34 per cent, respectively, after the second application. Similarly, 49.50 and 97.48, 44.66 and 92.49, 46.33 and 85.68 and 66.66 and 91.92, 50.66 and 88.77 and 43.33 and 84.90 per cent mortality was recorded with sevin+thiodan, sevin+phosvel and sevin+nuvacron at 96 hours after the first and second applications, respectively.

Comparatively, sevin+thiodan, gave the best control of maize shootfly and jassid, followed by sevin+phosvel and sevin+nuvacron, in order of merit. Thiodan, a hydrocarbon gave a longer residual toxicity and thus a better kill

of the pest as compared to phosvel and nuvacron which are phosphatic insecticides. The mortality observed after the first application was more which may be attributed due to lesser growth of plants and more pest population in the field at the time of first application. However, no significant effect on mortality was observed 72 and 96 hours after the treatments and therefore, subsequent observations were ignored. Concludingly, it is recommended that in cases of severe infestations the time interval between the treatments be further reduced and the number of sprays be increased to curl the population of the pest insects before it reaches the threshold level.

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