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Efficacy of Selected Insecticides at Different Location Against Pod Borer (*Etiella zincknella* Tr.) on Field Pea (*Pisum sativum* L.)

KEYWORDS: Insecticides, pod borer, Field pea, *Etiella zincknella* Tr.

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ABSTRACT *An experiment was conducted to evaluate the efficacy of selected insecticides at different location against pea pod borer (Etiella zincknella Tr.) in the experimental field of Department of Plant Protection, Sam Higginbottom Institute of Agriculture, Technology and Sciences (SHIATS), Allahabad in Rabi season of 2011-2012 and Dayal Fertilizers Pvt Ltd. Partapur, Meerut in Rabi season of 2012 – 2013. Seven treatments including control with three replications were taken up using RBD. Foliar spray of insecticides viz. malathion @ 0.05%, cabaryl @ 0.15%, chlorpyriphos @ 0.05%, cypermethrin @ 0.006%, deltamethrin @ 0.002, quinalophos @ 0.05% were given at an interval of 3, 7 and 14 days while check plots were sprayed with water. Chlorpyriphos @ 0.05% proved superior against the larval population of pea pod borer as compared to other treatments.*

INTRODUCATION:

Pea (*Pisum sativum* L.) is cultivated as an important vegetable as well as pulse crop throughout the world. It can be grown around the year under variable climatic conditions **(Singh, 2007).** Field pea originated in Europe and Western Asia and is grown throughout the world as a cool season crop. The crop is attacked by many insect-pests, among which pea pod borer (*Etilla zinckenella* Tr.) and stemfly (*Melanogromyza phascoli*) are serious pest in Uttar Pradesh. **Bijjur and Verma (1997)** reported 57 species of insects attacking pea crop with an annual monetary loss of 540 million Indian Rupees. Pea pod borer (*Etilla zinckenella* Tr.) is a major pest of field pea causing as high as 50.9% pod infestation with 77.64% seed damage resulting in 23.9% loss in the grain yield. **Yadav and Chauhan (2000)** observed that *Etilla zinckenella* Tr. caused 3.5% to 30.8% pod damage in pea crop in Uttar Pradesh alone. It is distributed throughout India with particular reference to Uttar Pradesh, Bihar, Madhya Pradesh and Punjab. The damage is caused by the larva **(Mathur and Upadhyay, 2006).**

MATERIALS AND METHODS:

The trial was laid out in randomized block design (RBD) with three replications and seven treatments including check in the experimental field of Department of Plant Protection, Sam Higginbottom Institute of Agriculture, Technology and Sciences (SHIATS), Allahabad in Rabi season of 2011-2012 and Dayal Fertilizers Pvt Ltd. Partapur, Meerut in Rabi season of 2012 – 2013. Each replication consisted of 21 plots of 2×1m each. The pea crop cv. "Rachna" was sown in November with a spacing of 30 × 10 cm. Fertilizers NPK (20:20:20 kg/ha) were applied as per recommended dose. The plots were irrigated twice at 22 and 57 days after sowing (DAS). Foliar spray of six insecticides viz. malathion @ 0.05%, cabaryl @ 0.15%, chlorpyriphos @ 0.05%, cypermethrin @0.006%, Deltamethrin @ 0.002% and quinalophos @ 0.05% as per treatment at the onset of larva infestation. The observations on the larval population were made one day before and 3, 7, and 14 days after spray from 5 randomly selected plants of each plot. The data collected was statistically analyzed.

RESULTS AND DISCUSSION:

From the result presented in tables 1,2, and 3 it is evident that there is no significant differences among the treatments including control in respect of larval population during 2012 and 2013.

After spraying the data on surviving larval population (Table 1) indicated that the differences in larva population of pod borer at 3, 7 and 14 DAS were significant. All the insecticides recorded significantly lower larval population than untreated control. The treatment chlorpyriphos 20 EC @ 0.05% ml/l significantly minimized the larval population at 3rd, 7th and 14th DAS. The mean larval population was observed in chlorpyriphos 20 EC @ 0.05% (3.6, 1.8 & 0.50 larva/5 plants), followed by cypermethrin 25 EC @ 0.006% (3.8, 2.2 & 1.3 larva/5 plants), deltamethrin 2.8 EC @ 0.002 (4.2, 2.9 & 1.4 larva/5 plants), quinalophos 25 EC @ 0.05% (4.8, 3.6 & 2.1 larva/5 plants), cabaryl 85WP @ 0.15% (4.9, 3.9 & 2.5 larva/5 plants), malathion 50 WP (5.1, 4.3 & 3.0 larva/5 plants) as against untreated control of (6.5, 8.5 & 10.5 larva/5 plants).

Table1
Effect of insecticidal sprays on larval population of pea pod borer (2011-2012)

Treatment	Con (%)	*Mean of larval population 1 day before spray	*Mean of larval population after spray		
			3 day	7 day	14 day
Malathion	0.05	5.5	5.1	4.3	3.0
Cabarly	0.15	5.4	4.9	3.9	2.5
Chloropyriphos	0.05	5.7	3.7	1.9	0.5
Cypermethrin	0.006	5.2	3.9	2.2	1.1
Deltamethrin	0.002	5.1	4.3	2.9	1.4
Quinalphos	0.05	4.7	4.9	3.7	2.1
Control		5.3	6.5	8.5	10.5

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CD (P=0.05)		0.78	0.54	0.64	0.39
S.Ed±		0.36	0.25	0.3	0.18
CV(%)		8.11	6.36	9.2	7.2
Result		NS	S	S	S

*Mean of 3 replication and 5 plants

CD – Critical difference; CV – Coefficient of variation (%) ;

During 2012-2013 (Table 2) all the insecticides recorded significantly lower larval population than untreated control. The treatment chlorpyriphos 20 EC @ 0.05% significantly minimized the larval population at 3rd, 7th and 14th DAS. The mean larval population was observed in chlorpyriphos (2.3, 1.4 & 0.3 larva/5 plants), followed by cypermethrin (2.9, 1.6 & 0.9 larva/5 plants), Deltamethrin (3.5, 2.3 & 1.2 larva/5 plants), quinalophos (4.3, 3.3 & 2.0 larva/5 plants), cabaryl (4.4, 3.5 & 3 larva/5 plants), malathion 4.8, 4.4 & 4.1 larva/5 plants) as against untreated control of (6.8, 9.2 & 10.8 larva/5 plants).

Table 2
Effect of insecticidal sprays on larval population of pea pod borer (2012-2013)

Treatment	Con (%)	*Mean of larval population 1 day before spray	*Mean of larval population after spray		
			3 day	7 day	14 day
Malathion	0.05	5.40	4.8	4.4	4.1
Cabarly	0.15	5.20	4.4	3.5	3.0
Chloropyriphos	0.05	4.80	2.3	1.4	0.3
Cypermethrin	0.006	5.07	2.9	1.6	0.9
Deltamethrin	0.002	4.60	3.5	2.3	1.2
Quinalphos	0.05	4.73	4.3	3.3	2.0
control		5.3	6.8	9.2	10.8
CD (P=0.05)		0.76	0.63	0.75	0.56
S.Ed±		0.35	0.26	0.35	0.26
CV(%)		8.53	8.57	11.5	10.0
Result		NS	S	S	S

*Mean of 3 replication and 5 plants

CD – Critical difference; CV – Coefficient of variation (%)

On averaging the two year data (Table 3), it was observed that 3, 7 and 14 DAS. The treatment chlorpyriphos 20 EC @ 0.05% significantly minimized the larval population at 3rd, 7th and 14th DAS. The mean of two year larval population was observed in chlorpyriphos (3, 1.6 & 0.4), was better than all the other treatments followed by cypermethrin, Deltamethrin, quinalophos, cabaryl, malathion as against untreated control of (6.7, 8.8 & 10.7).These findings are in agreement with **Sinha and Sharma (2010), Balasubramanian *et al.* (2001), Ujagir (1999),** and **Bijjur and Verma (1997).** They also reported that chlorpyriphos was the most effective insecticide for minimizing the larval population on pea pod borer.

Table 3
Effect of insecticidal sprays on larval population of pea pod borer (Averages of 2011-2012 and 2012-2013)

Treatment	Con (%)	*Mean of larval population 1 day before spray	*Mean of larval population after spray		
			3 day	7 day	14 day
Malathion	0.05	5.5	5.0	4.4	3.5
Cabarly	0.15	5.3	4.7	3.7	2.8
Chloropyriphos	0.05	5.3	3.0	1.6	0.4
Cypermethrin	0.006	5.1	3.4	1.9	1.0
Deltamethrin	0.002	4.9	3.9	2.6	1.3
Quinalphos	0.05	5.2	4.6	3.5	2.1
Control		5.2	6.7	8.9	10.7
CD (P=0.05)		0.69	0.46	0.51	0.29
S.Ed±		0.32	0.21	0.24	0.13
CV(%)		8.53	8.57	7.6	5.3
Result		NS	S	S	S

*Mean of 2 Averages data yerar (3 replication and 5 plants)

CD – Critical difference; CV – Coefficient of variation (%)

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