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MONITORING OF INSECT PEST COMPLEX ASSOCIATED WITH PEA IN EASTERN U.P. CONDITION

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ABSTRACT

The pest spectra comprised of nine species observed to attack pea at different stages of crop growth in an overlapping manner. Among them Surface Grasshopper, *Chrotogonus* trachypterous, stem fly, *Ophiomyia phaseoli* (Tryon) leaf miner, *Phytomyza atricornis*, whitefly, *Bemisia tabaci* and aphid, *Acyrthosiphon pisum,* blue butterfly, *Lampides boeticus* and Semilooper, *Plusia orichalcea* has assumed the status of minor pests. Whereas, Gram pod borer, *Helicoverpa armigera* and pea pod borer and *Etiella zinckenella,* were recorded as major pests during two consecutive seasons i.e. rabi, 2022-23 and 2023-24 under K.V.K. cafeteria and Farmer field condition.

Keywords **:** Aphid, farmer field, grasshopper, rabi, kvk, pod borer, pea pea pod borer and stem fly.

Introduction

Pea *Pisum sativum* L., belonging to the family Fabaceae, is an important vegetable grown in the Indian subcontinent, in the milder temperate zones. It is cultivated on 591 ha in India, with production of 6497 mt and productivity of 1375 kg/ha (Anonymous, 2022) It is highly nutritive and contains high proportion of digestible protein (22.5%), carbohydrates (62.1%), Fats (1.8%), minerals (Ca – 64mg/100g, Fe – 4.8mg/100g) and vitamins (Riboflavin–0.15mg/100g, Thiamin – 0.72mg/100g and Niacin – 2.4mg/100g). Pea contributes about 3% in total pulse area and about 5% in total pulse production of India. They have high levels of minerals like potassium, phosphorus, calcium, iron and vitamins viz., vitamin A and C, riboflavin, thiamine, niacin and folate, as well as their digestible fibre content (5.9-12.7 per cent), have been shown to benefit heart health, digestive health, and cancer prevention (Tiwari *et al*., 2019 & Murade *et al*., 2014). India is the largest producer as well as consumer of pulses in the world. Among the *rabi* pulse crops, pea accounts for about 7 per cent of total pulse production in India. The major field pea producing states in India are Uttar Pradesh, Madhya Pradesh, Jharkhand, Assam, West Bengal and Bihar**.** In India, Pea is grown in 5.91 lakh ha with an annual production of 9.10 lakh tonnes and productivity of 1222 kg ha^{-1}. In Uttar Pradesh, it occupies an area of 2.40 lakh ha with a production of 4.03 lakh tonnes and productivity of 1467 kg ha^{-1} (Annonymous, 2022).

Losses due to insect pests are a handicap for its maximum yield. From seedling to harvest, 24 insect pests have been reported (Bijjur and Verma, 1995). Insect pests like pea pod borer, *Etiella zinckenella*, pod borer, *Helicoverpa armigera*, blue butterfly, *Lampedes boeticus*, pea stemfly, *Ophiomyia phaseoli*, cotton jassid, *Emrasca devastans*, pea leaf miner, *Phytomyza atricornis*, aphid, *Myzus persicae* and mite, *Tetranychus telarius*, pod fly, *Melanogromyza obtusa* and tobacco caterpillar, *Spodoptera litura* are serious pests and causes substantial loss to pea crop (Mittal and Ujagir, 2007). On an average, 2.5 to 3.0 million tonnes of pulses are lost annually due to pest complex with a monetary value of nearly Rs. 6,000 crores because of damages caused by insect-pests (Reddy, 2009). Hence, there is a great scope to study on insect

pests complex of pea. An attempt is made here to determine what appear to be the major pests of pea crop.

Materials and Methods

The field trial to study insect pest complex was conducted during rabi, 2022-23 & 2023-24. A plot size of 100 m^2 with Azad P-1 variety was raised in crop cafeteria of K.V.K., Sohaon Ballia and three farmer field of village Basantpur, Ujiyar & Laxmanpur with row to row and plant to plant spacing of 30 x 10 cm, respectively, by following standard agronomical practices and maintained without insecticidal application to study the succession of insect pests associated with pea crop. The crop was sown in November. The incidence of insect pests was recorded right from germination till the harvest of the crop at weekly intervals. Observations were recorded on the population of different insect pests of pea on 10 randomly selected tagged plants.

Results and Discussion

Nine insect pests were recorded during the cropping season at different stages of pea of which 3 belonged to Lepidoptera and Hemiptera, two species of Diptera whereas one species to Orthoptera, (Table 1). It was observed that the pest species infested different parts *viz.*, leaves, shoot and pod. The insect abundance, which occurred consistently ubiquitously and causing appreciable damage, were categorized as major insect pests. Those insects appeared for a short period or in fairly low numbers were categorized as minor pest.

Surface Grasshopper, *Chrotogonous trachypterous* (Blanchard)

The Grasshopper, nymph and adult were found mostly in the vegetative stage of the crop; feed on leaves in sporadic form, irregular cutting on the margins of leaves were observed in the field. The insect was recorded minor pest during the period of study.

Pea stem fly, *Ophiomyia phaseoli* (Tryon)

The infestation of this pest found to be economic and assume the status of major pest in the area during the period of study. During the period of study, the maggot of *O. phaseoli* was found to attack on stem from seedling stage and continued up to the end of vegetative stage. The damage is more severe on seedlings than on the grown up plants.

Whitefly, *Bemisia tabaci* (Genn.)

Both nymph and adult stages were documented puncturing cells to draw sap through their feeding sites.. They were found very sparingly distributed with stray economic status during both the years i.e. rabi 2022-23 and 2023-24, in this area.

Pea aphid, ***Acyrthosiphon pisum* (Harris)**

The nymphs and adults suck the sap from under surface of the leaves and tender shoots. It marked its appearance at the vegetative stage of crop growth. It is a pest of minor importance on pea as evidenced by its lower relative abundance.

Leaf miner, *Phytomyza atricornis* (Meigen)

Leaf miner appeared during the vegetative stage of the crop continue damage upto maturity of the crop. The pea leaf miner population appeared in 1st week of December and gradually reached up to maximum level during 1st week of February.

Semilooper, *Plusia orichalcea* (Fab.)

The larvae of this pest bite hole in the leaves and cause severe damage by reducing photosynthesis area. This insect was active from vegetative to pod maturity stage of crop. According to its abundance it is considered as a minor pest on black gram.

Blue butterfly, *Lampides boeticus* (Linn.)

Blue butterfly appeared during the flowering and podding stage and continued till the maturity of the crop. This was not found to be serious insect-pest and categorized under minor insect-pest.

Pod borer, *Helicoverpa armigera* (Hub.)

The *Helicoverpa armigera* larvae were observed feeding on leaves, flowers, pods, and seeds, causing economically significant infestations that categorize this as a major pest during both seasons.

Pea pod borer, *Etiella zinckenella* (Treit.)

The infestation of *Etiella zinckenella* found to be economic and it attained the status of major pest. The incidence of this pest was started from last week of December *i.e.*, during the flowering stage and continue till the maturity of the crop.

The findings are agreed with Shantibala *et al.* (2007) who noticed 19 pea crop pests representing 6 orders and 13 families. Mittal and Ujagir (2007) recorded 32 pests that damaging pea crop. The findings are agreement with Yadav *et al*. (2019) recorded 7 species of insect pests in all stages of the pea and overall observations found that gram pod borer and pea pod borer has attained the status of major pest. Yadav and Patel (2015) tracked 5 overlapping pea pest species across crop development. Tare *et al*. (2023) who recorded major insect pests on pea *Pisum sativum* at different growth stages.

Conclusion

Pea crop was found to damage by nine insect pests. Among these two insect-pests has attained the status of major pest *i.e*. pea pod borer, *Etiella zinckenella* and pod borer, *H. armigera* whereas, the remaining insect-pests attained the status of minor pest. These major insect pests may reduce the yield considerably.

Table 1 : Insect pest complex associated with pea crop during *rabi*, 2022-23 & 2023-24.

S. No.	Common Name	Scientific Name	Order	Family	Damaging stage	Crop stage	Economic status
1.	Surface Grasshopper	*Chrotogonous trachypterous* (Blanchard)	Orthoptera	Acrididae	Nymph and Adult	Vegetative and young pods stage	Minor
2	Stem fly	*Ophiomyia phaseoli* (Tryon)	Diptera	Agromyzidae	Maggot	Seedling and Vegetative	Minor
3	Whitefly	*Bemisia tabaci* (Genn.)	Hemiptera	Aleurodidae	Nymph & Adult	Vegetative	Minor
4	Leaf miner	*Phytomyza atricornis* (M.)	Diptera	Agromyzidae	Maggot	Vegetative	Minor
5	Aphid	*Acyrthosiphon pisum* (Harris)	Hemiptera	Aphididae	Nymph & Adult	Vegetative stage and young pods	Minor
6	Semilooper	*Plusia orichalcea* (Fabricus)	Lepidoptera	Noctuidae	Larva	Vegetative stage	Minor
7	Blue butterfly	*Lampides boeticus* (Unn.)	Lepidoptera	Lycaenidae	Larva	Flowering and podding	Minor
8	Gram pod borer	*Helicoverpa armigera* (Hub.)	Lepidoptera	Noctuidae	Larva	Flowering and Podding	Major
9	Pea pod borer	*Etiella zinckenella* (Treitschke)	Lepidoptera	Noctuidae	Larva	Flowering and Podding	Major

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Conflicts of interest

No conflict of interests.

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