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Study on Insect Pests of Moth bean (Vignaaconitifolia) during Kharif Season in Taranagar tehsil of Churu (Rajasthan)

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Abstract: Moth bean is important pulse crop in India due to its nutritional value. Its grain contains protein, fat, carbohydrate, vitamin and minerals therefore human uses it in various ways in food. Moth bean crop cultivated as kharif and summer season in India. Various species of insect pests are infested to moth bean crop and cause very harmful effect to crop and farmer. These pests decrease productivity and quality of moth bean. During this investigation the experiment was conducted for the study of insect pests on moth bean crop during kharif season. This experiment was conducted at a farm in Taranagar. Taranagar is a tehsil of Churu district in Rajasthan. In this experiment, RMO- 40 variety of moth bean was grown in a plot size of 10m × 10m with 20 cm row to row and 15 cm plant to plant spacing was used. These insect pests were Aphis crassivora, Empoascamotti, Bemisiatabaci, Holotrichiaconsanguinea, Phyllotretacruciferae, Amsactamoorei, Ophiomyiaphaseoli and Odontotermesobesus. The incidence of these insect pests were started from seedling and continued till the maturity of the crop.

Keywords: Insect Pests, Moth bean, Whitefly, Jassid, Aphid.

Introduction: Moth bean (Vignaaconitifolia (Jacq.) known by several local names (Kheri, Bhioni, Matki, Math, Madike, Kunkuma etc.) in different linguistic regions of India. It is important crop of arid and semi-arid regions.The area of mothbean in India is roughly 1.11 million hectares, with an annual production of 0.31 million tones and a productivity of 277 kg/ha (Anonymous, 2018) Gujarat, on the other hand, has a 0.32 million hectare area and produces 0.15 million tonnes annually (Anonymous, 2016-17).

It is cultivated from India. In India, it is cultivated mainly in Rajasthan, Haryana, Gujarat, Maharashtra and Uttar Pradesh. The state of Rajasthan contributes about 75-80% of the national production. In the arid zone of Rajasthan, it is the only pulse crop cultivated during Kharif in the Churu, Bikaner, Barmer, Jaipur, Jalore, Jhunjhunu, Nagaur, Jodhpur, Sikar and Pali districts. Moth bean is a source of food, fodder, feed, green manure and used as pasture hence, serves as a multipurpose crop.

Green pods are delicious source of vegetables. Being pulse, it is a cheap source of vegetable protein for balancing the nutritional deficiency. Despandey and Rao (1954), and Pant and Tulsiani (1963) observed that in India, pulses contribute as much as 26 percent of the total protein and around 11 percent of the total calorie intake. The moth bean seed contain about 10.30percent moisture, 25.66 percent protein, 2.78 percent fat, 0.41 percent mineral matter, 3.90 percent fiber and 61.76 percent carbohydrate. Moth bean is comparatively richer in proteins. It is also a good source of leucine and lysine amino acids. Dry seeds of moth bean are used for preparation of a number of delicious confectionery items (mangori, papad, and bhujia- namkins).

But this important crop is very much damaged by various pests and pests may be of various kinds as – insect rodents, mammals. FAO estimates that annually up to 40% of global crop production is lost to pests. The insect pests that attack moth bean can be classified based on their appearance in the field as it relates to the phenology of moth bean plant. They are thus stem feeders, pod feeders, foliage feeders and Storage pests. Large number of foliage feeders belonging to orders lapidoptera and coleoptera feed on the foliage of moth bean and many other related legumes. Most of these insects are highly polyphagous and feed on wide variety of legumes and non- legumes.

The crop is damaged at various stages of plant growth by a number of insect pests, such as white grub, Holotrichiaconsanguinea ; termite, Odontotermesobesus ; jassid, Empoascamotti ; whitefly, Bemisiatabaci ; galerucid beetle, Madursiaobscurella ; thrips, Caliothripsindicus ; stem fly, Ophiomyiaphaseoli ; red hairy caterpillar, Amsactamoorei ; flea beetle, Phyllotretacruciferae and pod borer, Catechrysopscnejus which have been reported to cause moderate to serve damage starting right from germination to maturity and there by posing a serious threat to its cultivation (Bindra and Singh, 1969 ; Puttaswami et al., 1977 ; Parihar, 1979; Satyavir, 1980 and Pareek et al., 1983). Satyavir et al. (1984) reported that jassids and whiteflies also act as vector of yellow mosaic virus apart from causing direct damage by desaping. Singh and Singh (1978) studied that the tactics of appropriate intercropping are gaining momentum in the overall strategies of pest management through its physical as well as biological influence on the succession and population build up of insect pests.

India is an agricultural country. The country needs to produce more and more to keep pace with the ever - increasing population. Today India has become self - sufficient in food grains production due to the effect of Green Revolution. From a food importing country it has become a food exporting country. The intensive use of inputs has created several problems related to sustainability of agriculture. Soil, water and air are getting polluted. The farming system these days need drastic change owning to the change in human needs.

Aims of the study:

•To investigate the impact of sowing date on the prevalence of mothbean insect pests.

• Against Assess the degree of resistance of various mothbean entries to its main insect pests.

• In semi-arid region of Rajasthan, search for National advisory of mothbean insect pests.

• The impact of intercropping on the prevalence of mothbean insect pests.

Material and methods: The field experiment was conducted during kharif season for the study of insect pests of moth bean crop. The site of experiment was a local farm in Taranagar, district- Churu, Rajasthan (India). This site is located in hyper and partial irrigated agro-climatic zone of Rajasthan (Hussain, 2015). The infestation of insect pests on moth bean crop was observed on variety RMO-40. Moth bean cultivated in a plot size of 10m × 10m with 20cm row to row and 15cm plant to plant spacing. The crop under investigation was uncovered to natural infestation and also free from insecticides throughout the experiment. The observation of insect pests on crop was initiated from seedling and continued till to crop harvesting. During this experiment insect pests were collected by hand net, light trap and aspirator. After the collection, pests were transfer into

killing bottle for the kill. The dead insect pests were mounted and preserved with the help of entomological pin and setting board. After this, identified to the collected insect pests by the help of taxonomic key and identified insect pests are stored temporary in insect collection box.

Results and discussion: According to study of insect pests of moth bean during kharif season recorded that many insect species were infested on moth bean crop. These insect pest were aphid (Aphis craccivora), jassid (Ampoascamotti), whitefly (Bemisiatabaci), White grub (Holotrichiaconsanguinea), Flea beetle (Phyllotretacruciferae), Red hairy caterpillar (Amsactamoorei), Stem fly (Ophiomyiaphaseoli) and Termite (Odontotermesobesus). These insect pests cause a lot of harm to plants by sucking sap and eating leaves.

Fig. 1: White fly

Fig. 2: Jassid

Fig. 3: White grub

Fig. 4: Flea beetle

Whitefly: A serious pest of moth beans, whiteflies serve as a vehicle for the Yellow Mosaic Virus. The second week of September is often when whitefly incidence peaks. The cell sap in particular is sucked from the surface of the leaves by the nymphs and adults.

Jassids: This pest is present from the crop's vegetative stage until harvest. Both adults and nymphs consume the cell sap. The adult is a little bug that eats leaves. Jassids come in manygenerations throughout the year. In cases of severe infestation, the leaves turn dark, curl, and eventually dry out before falling to the ground.

White grub: The moth bean is among the crops that are severely harmed by the white grub, which is a significant beetle. Following rainfall, beetles emerge from the soil and feed on a variety of host foliage trees. Before returning to the soils to deposit their eggs, the beetles mate. Grubs only produce one generation per year. Between July and October, the grub consumes the roots.

Conclusion: Many insect pests are infested to moth bean. Hemipterans pests reported from three family viz. Cicadellidae, Aphididae and Aleyrodidae. Coleopterans pests reported

from two species viz. Chrysomelidae and Scarabaeidae. These insect pests cause lot of harm to crop by sucking sap and eat leaves of plants. Therefore, these insect pests are cause lot of economically losses to farmer.

References:

Anonymous (2016): Annual Progress Report. All India Network Research Project onArid Legume, Indian Institute of Pulses Research, Kanpur-208 024.

Anonymous (2018): Annual Progress Report. All India Network Research Project on Arid Legume, Indian Institute of Pulses Research, Kanpur-208 024.

Bindra, O.S. and Singh, H. 1969: Pea stem borer, Melanogromyza (Agromyza) phaseoli Tryon. (Diptera, Agromyzidae). Pesticides, 3 (7): 19-21.

Despandey, P.D. and Radhakrishna Rao, M.V. 1954: Nitrogen complex and amino acid composition of (i) Emerenthusgangaticus and Phaseolusaconitifolins. Indian J. Medical Res., 42 : 77-83.

Hussain, M. (2015): Agro-climatic Zones and Economic Development of Rajasthan. International Journal of Humanities and Social Science Invention. 4(2): 50-57.

Pant, R. and Tulsiani, D.R.P. 1963: Total soluble carbohydrates and reduction substances of some leguminous seeds. Current Sci.,37 : 74-75.

Parihar, D.R. 1979: Out break of Katra, Amrasctamoorei in the Rajasthan desert. Annals of Arid Zone, 18 (1/2). . 140-141.

Pareek, B.L., Sharma, R.C. and Yadav, C.P.S. 1983: Record of insect faunal complex on Moth bean, Vignaaconitifolia (Jacq.) Marechal in semi-arid zone of Rajasthan. Bull. Ent., 24 (1) : 44-45.

Puttaswamy, Gowda, B.L.V. and Ali, T.M.M. 1977: Record of pests infesting Moth bean, Phaseolusaconitifolia (Jacq.) a potential pulse crop. Curr. Res., 6 (4) : 69-71.

Satyavir, 1980: Seasonal incidence of insect pests of Mothbean and cowpea crops.

Satyavir, 1983a: Efficacy of some important insecticides for the control of B. tabaciGenn, a vector of the yellow mosaic disease on Moth bean. Indian J. Plant Prot., 11 (1) : 31-32.

Satyavir, Jindal, S.K. and Lodha, S. 1984: Screening of Moth bean cultivars against jassid, white fly and yellow mosaic virus .Annals of Arid Zone, 23 (2) : 99-103.

Singh, R.N. and Singh, K.M. 1978: Influence of intercropping on succession and population build up of insect pests in early variety of red gram, Cajanuscajan (L.) Millsp. Indian J. Ent. 40 (4) : 361-375.