

Population variation of Brinjal shoot and fruit borer, *Lucinodes orbonalis*. G. in relation to soil, cropping pattern and topography in Bihar

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ABSTRACT : Brinjal is cultivated in about 30,000 hectares of land in Bihar spread between 22⁰ - 29⁰ longitude and 84⁰-89⁰ latitude - LECINODES ORBONALIS G. is very serious pest of Brinjal plant.

Bihar is divided into three distinct agro-ecological zones showing the various degree of Borer infestations. Higher mean infestation (29%-34%) was observed in North and South Bihar plains having limy-alkaline and black-grey neutral soils respectively where regular intense-cropping pattern exist. However, South Bihar plateau with red-acidic soil coupled with alternate-scattered cropping pattern should lower mean infestation 18.15%. According to topography indirect bearings of infestation of it influences fertility of the soil and cropping pattern of the area.

Keywords- Topography, Ecological zone, *Lucinodes orbonalis*. *Solanum melongena*.

INTRODUCTION :

Brinjal (*Solanum melongena* L.) is a vegetable enriched with essential elements of food and consumed by every section of human population (Choudhary, 1985). It is grown on 29,900 hectares of land in Bihar (Singh, 1985) spread between 23°-28° longitude and 83°-88° latitude (Anonymous, 1973). More than 150 insect pests have been recorded feeding on brinjal which if left unchecked often result 100% crop loss (Tewari, 1986). Out of them *L. orbonalis* occupies the place of most destructive pest to brinjal cultivation (Mahto et al, 1983) throughout Bihar. In view of the seriousness of the problem, the present investigations were carried out to identify the endemic areas in Bihar and pattern of distribution in relation to soil, cropping pattern and topography to determine the integrated control measure.

MATERIAL AND METHODS:

Bihar is divided into three distinct Agro-ecological zones viz. (i) North Bihar Plains, (ii) South Bihar Plains and (iii) South Bihar Plateau. Survey and collection was made for two years from March, 2011—to February, 2012 covering all the zones of Bihar viz., Muzaffarpur 2012, Vaishali, Samastipur, Darbhanga, Sitamarhi, Saran, East Champaran, Madhubani, Saharsa, Begusarai and Katihar in North Bihar Plains; Patna, Nalanda and Arra in South Bihar Plains and Gaya, Deoghar, Bhagalpur, Palamu and Ranchi districts in Plateau region.

RESULT AND DISCUSSION :

The mean of two years of survey was recorded as 29% in North Bihar Plains, 34% in South Bihar Plains and 8.15% Min South Bihar Plateau. This result was computed with topography (Height from sea level/Annual Normal Rainfall), Soil and cropping pattern of the specific regions to show the pattern of distribution and identify the endemic areas (Table-I)

Table : IPopulation Variation of *L. orbonalis* G. in relation to Topography, Soil and cropping pattern

Zone	Topgraphy		Soil	Cropping pattern	Mean Infestation
	Mean Height from sea-level (metre)	Mean Annual Rainfall (mm)			
North Bihar Plains	54.81	12.37	Limy/Nonlimney Alkali	Intense & Regular	29%
South Bihar Plains	63.33	1019	Grey/Black, Neutral	Intense & Regular	34%
South Bihar Plateau	423.56	1525	Red Acidic	Scattered & Arcernate	18.15%

Limy/Non-limy & Alkaline soil of north Bihar plains and Grey/Black Neutral soil of South Bihar plains have been found favourable for the population build up of the borer. Red/Acidic soil prevailing in South Bihar Plateau seem to be unfavourable for the borer owing to possibility in change of usual chemical nature of the brinjal shoot and fruit. Further the cropping intensity in Bihar (1.34) is higher than the national average (1.19) in general (Anonymous, 1985). In case of Brinjal, borer incidence was found higher in areas having regular and intensive cropping (central north plains and south plains) while it was observed lower where alternate and scattered pattern of cropping is in practice (South plateau). Topography showed indirect bearing on infestation as it influences the fertility of the soil and cropping pattern. Patel et al, (1948) and Shrivastava (1968) recorded higher infestations in plains of Bengal, U.P. and Rajasthan. Such coincidence in observation lead to conclude safely that the distribution of the brinjal shoot and fruit borer is fairly high and in continuation in the plains of Northern India. Intensification of brinjal plant also influenced to migrate in other areas in search of host plants where they have not been able to reach the optimum breeding potentiality as evident from lower infestation. This may be due to the prevailing ecological conditions of the new area as well as cropping pattern.

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