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A Study on the Pest and Their Management in the Hanumangarh Region (Rajasthan)

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ABSTRACT: The author has done studies related to crop pests and their management in the Hanumangarh region. Many pests damage the crops grown here. The author reported different types of pests in this study such as red cotton bug, mealy bug, locust, grasshoppers, caterpillar etc. Farmers use many types of pesticides to control these pests. Most farmers use more and more chemicals for pest management.

KEYWORDS: Hanumangarh, insect, pest, crop, pesticides, farmers.

INTRODUCTION: Insects are very special types of creatures found in nature. These insects are included in the Arthropoda phylum of the animal kingdom. Insects are universal organisms, which are found everywhere in the environment. These insects have very special adaptations, so these insects are found in all habitats like water, land, air etc. The body of insects is divided into three parts – the head, thorax and abdomen. These insects are known as hexapods, meaning they have three pairs of legs. Most are capable of flying and have two pairs of wings. Antennae, compound eyes, mouthparts, ocelli, etc. are found in these insects. Insects are very beneficial to our ecosystem.

For a balanced ecosystem in a place, it is very important to have a rich biodiversity. These insects do a very important job as pollinators and decomposers in the environment. We also get many beneficial products from some insects. In this way, insects are beneficial in many ways.

On the other hand, some of these insects also damage crops in agricultural areas, they are called pests. These pests are very dangerous for crops. Due to these pests, the production of crops is also adversely affected. Sometimes the attack of these pests is so dangerous that they destroy the entire crop.

Many insects are found in pest form. In most of insects there are four stages in their life cycle: egg, larva, pupa and adult. Along with the adult insects, their larvae called caterpillars also cause great damage to the crops. Their larvae i.e. caterpillars only do the work of eating and they are called eating machines. These caterpillars devour the leaves of the crops. These pests reduce the production by eating different parts of the plants like leaves, flowers, fruits etc. Many crops are produced in hanumangarh region due to the rich irrigation system. Crops like rice, mustard, narma, wheat, cotton, BT Cotton, moong, millet, etc. are cultivated here.

Many pests damage these crops in this area. To control these pests, the farmers of this region adopt several methods. Most farmers use pesticides for these pests. In this research work, the author has studied the pests and their management in the Hanumangarh area.

STUDY AREA: Hanumangarh (Rajasthan) region has been selected for this study. This region is located in the northern part of Rajasthan. The study area Hanumangarh is a district of Rajasthan. Hanumangarh has situated between 290 5'N to 300 6'N latitudes and 740 3' to 750 3' longitude. Hanumangarh district experiences extreme heat in summers and extreme cold in winters. There are many variations in temperature in this region. Here the temperature fluctuates from 0°C to 50°C.

This area is mainly based on agriculture. Many crops are grown here. This region is also famous as cotton belt. The agriculture here is mainly dependent on canal water, but some areas are still dependent on rain. Agriculture and Horticulture activities in the Hanumangarh area are based on Indira Gandhi Canal Project (IGNP). Rainfall is mostly confined to the monsoon season. Rainfall in this region is also irregular. The Ghaggar River also flows in this area which flows during the rainy season. The downstream area of Ghaggar is known as the Nali.

MATERIAL & METHODS: The study was carried out in the Hanumangarh region of Rajasthan. The author completed the work for this study through insect photography, visits to agricultural sites, observations, insect collections method, farms visit, and talk with farmers. In this work, many instruments like insect nets, killing bottles, insect boxes, microscope, mobile etc. were used as per requirement. Some insects were collected by hand picking method from crops and insect nets were used for some. The captured insects were preserved in insect boxes and identification keys were used to identify them.

RESULT AND DISCUSSION- Agriculture work is done on a very large scale in the Hanumangarh region. Many crops are produced on a large scale in this area. Here are the main crops and the pests which are found in this area given in Table-01 and Table-02 respectively. Due to more activities related to agriculture and horticulture, pest attack is also more here. In the season, many pests are seen in the fields. Some of the major

pests are locusts, termites, aphids, grasshoppers, red cotton bugs, mealy bugs, red hairy caterpillars and many other caterpillars.

Table-01

S.N.	Name of Crops (Agriculture)	Name of Fruits /Vegetables (Horticulture)
1.	Wheat	Sugarcane
2.	Cotton	Ber
3.	BT Cotton	Kinnow
4.	Mustard	Potato
5.	Bajara	Tomato
6.	Ground nut	Spinach
7.	Barley	Reddish
8.	Rice	Carrots
9.	Gram	Cauliflower
10.	Guar	Khajoor
11	Taramira	Mosambi
12.	Moong	Chilli

Table-02

S.N.	Name of Crops	Name of Pests
1.	Cotton	white fly (*Bemisia tabaci*), Red cotton bug (*Dysdercus cingulatus*), cotton jassid(*Amrasca biguttula*), pink ball worm (*Pectinophora gossypiella*), mole cricket (*Gryllotalpa orientalis*), mealy bug (*Phenacoccus solenopsis*)
2.	Wheat	Termite (*Macrotermes serrulatus)*, aphid (*Schizaphis graminum*), army worm (*Spodoptera frugiperda*) , grasshopper (*Schistocerca americana*), pink borer (*Sesamia inferens).*
3.	Rice	Stem borer (*Sesamia inferens*), green leaf hopper (*Cicadella viridis*) .
4.	Mustard	Patent bug (*Bagrada hilaris*), aphid (*Lipaphis*

		erysimi), mustard saw fly (*Athalia lugens*)
5.	BT Cotton	Red cotton bug (*Dysdercus cingulatus*), cotton leaf worm (*Spodoptera litura*), Aphid (*Aphis gossypii*), Jassid(*Amrasca biguttula*), Thrips (*Frankliniella schultzei*)
6.	Bajra	Locust (*Cataloipus cymbiferus*), Red hairy caterpillar (*Amsacta albistriga*).
7.	Moong	White fly (*Bemisia tabaci*), Pod borer (*Maruca vitrata*)
8.	Barley	Green aphid (*Schizaphis graminum*), grasshoppers, click beetle (*Pyrophorus noctilucus*), khapra beetle (*Trogoderma granarium*).
9.	Gram	Pod borer (*Helicoverpa armigera*)
10.	Ground nut	Aphid (*Aphis craccivora*), leaf miner thrips (*Aproaerema modicella*), leaf eating caterpillar (*Amsacta albistriga*).

In this way, many pests damage the crop, which affects the production level. So, farmers use various types of pesticides to control these pests. Different types of chemicals are used for pest management in the Hanumangarh region.

Pest Management: Insects which is voracious feeder of crops known as pest. The pest management is management of a species defined as pest .There are various methods to manage the pest of different crops .In which some are following;-

Mechanical control- Different life stages of pest are killed by Mechanical force. Some adult insect pest are controlled and destroyed by hand nets example-leaf hopper and grasshopper etc. and the bag nets also can use to control the pest of different crops .the potato Tuber moth in cold store of potato control by low temperature. Some time direct sunlight also used to avoid the pest of stored grains. Light trap also used for controlling the nocturnal pest of different crop.

Chemical control- Is to control pest and diseases by using pesticides. There are following pesticides are used for different crops. Endoscarm 14.5 5c, imamectin benzoate, spinosad are used for gram pod borer. Flonicamide and corogen spray used for whitefly and for aphid, imidacloprid spray is applied in affected crop. Carbofuran spray use for control the stem borer of rice. BT cotton thiomethoxam, flonicomid 50cc, spinetoram, diafenthiuron etc. are use to control various type of jassid, aphid, thrips, and leaf worm.

Biological control- In this type of control living organisms play important role to suppress the population of specific pest organism .some insects which is predacious and parasitoidal in nature are natural enemies of the different pests. Predator like lady bug which is voracious Predators of aphid, mites, and for small caterpillars. Some wasp and flies are parasitoid in nature they lay their egg on or in the body of an insect host (pest) which is then used as food for developing larvae. Biological control is good for farmer friendly insects because it has very few harmful effects on them and for environment.

CONCLUSION: The author has found in this research work that agricultural activities are very rich in the Hanumangarh region. This study provides a comprehensive overview of crops and their pests. This study also gives knowledge of pests and their management procedures.

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