



Creepy Crawlers: A Look at the Insect Pests Devouring Wheat Fields

(*Rishiraj Singh Chundawat¹ and Radhika Shekhawat²)

¹Department of Entomology, MPUAT, Udaipur

²Department of Genetics and Plant Breeding, MPUAT, Udaipur

*Corresponding Author's email: chundawatrishiraj Singh09@gmail.com

Wheat (*Triticum spp.*) is the most important cereal among the field crops, not because of its antiquity but due to being an excellent food for mankind. Wheat is accorded a premier place among cereals due to its vast acreage devoted to civilization, high nutritive value and association with some of the earliest and most important civilizations of the world. Various insects causes considerable damage to wheat plants throughout their life and no stage of the crop is free from damage. Pests of wheat are either polyphagous or oligophagous and it is very rare, any insect found to be monophagous to wheat crop. Insect pests are dynamic and highly adaptable. Therefore, changes in environmental temperature can modify their physiology, behavior, voltinism and distribution. In order to fix the priorities and for evolving suitable pest management practices, continuous review of the pest complex of wheat crop under agro climatic conditions of India is need of the day which has not been carried systematically so far. The present article could help farmers to align the wheat production with the changing conditions and demand of time.

- 1. Aphid:** There are six species of aphids that damage wheat. These species include *Rhopalosiphum padi*, *Schizaphis graminurn*, *R. maidis*, *Metopoliphiurn dirhodum*, *Sitobion avenae* and *Diuraphis noxia*. Aphids feed on the leaves and grain heads of wheat. Aphid infestation cause rolling of flag leaf, trapping of emerging heads and awns that result in poor pollination. Aphid outbreak during early growing stages of wheat is very alarming. It damages the crop by sucking the cell sap from leaves, stem and kernels. Honey dew secreted by the aphid encourages black sooty mould development that leads to 20-80% damage by covering the leaves and interrupted the process of photosynthesis. Also these pests are significant in that they are capable of transmitting diseases to the plant such as barley yellow dwarf virus.
- 2. Cereal leaf beetle:** The cereal leaf beetle, *Oulema melanopus* L. (Coleoptera: Chrysomelidae), is an invasive insect from Europe that feeds on cereal crops, including wheat, barley and oats. The cereal leaf beetle has a wide host range in cereals and grasses. It prefers oat, barley, wheat, rye, timothy, fescue, grain sorghum and corn. Crop yield and quality are reduced due to lost photosynthetic activity resulting from the feeding damage. The fourth larval instar causes most of the crop damage, and this stage is responsible for about 70 percent of all crop damage. Feeding at the flag leaf stage is most damaging to crop yield. The adult and larvae feed on the plant leaves and chew long strips of tissue between the leaf veins. Adults can eat through the leaf completely while the larvae eat the upper leaf surface and leave a thin membrane of tissue. This feeding pattern can leave a window-pane effect on the leaf. Severe feeding damage can look like frost damage because leaves look whitish.

3. **Surface Grasshoppers:** Surface grasshoppers (*Chrotogonus trachypterus* and *C. oxypterus*) are polyphagous and feed on a number of cultivated crops. The common desert representative of the genus collected from western Rajasthan appeared to belong to *C. trachypterus*, being widely distributed on the ground (their habitat is the surface of the soil) and more frequently collected from nurseries, gardens and wheat and oats fields. Nymphs and adults feed on leaves by cutting germinating plants of cotton, wheat, paddy, oats, barley and others particularly in areas adjoining wasteland. Damage to cereals includes leaf notching and stripping but is most costly when stems are severed just below the heads of maturing or mature crops. When grasshopper numbers are extremely high and natural plant hosts in short supply, grasshoppers will consume or attempt to consume any plants or plant products that they come upon during their migrations in search of food.
4. **Ghujia weevil:** *Tanymecus indicus* is a common pest of young wheat and other crops in Uttar Pradesh, Bihar and Punjab. Ghujia weevil are greyish black in colour, measuring about 6-7 mm in length. Adults emerge out with the onset of monsoon in June and July and became sexually matured in the month of October - November. This weevil completes one generation in a year. The damage is caused by the adult weevils only and they cut the germinating seedling at ground levels and often crop has to be re-sown. The adults feed on leaves and tender shoots of the plants.
5. **Termites:** Termites ranks first as a pest of wheat not only in India, but in South Asia too. About 16 species of termite were found to damage the wheat crop in India, of these two species viz., *Odontotermes obesus* and *Microtermes obesi* were found dominant. The yield losses ranging 43 to 80 per cent in wheat were recorded due to termite damage. Due to termite damage the plants is dry up and can be easily pulled up. The damage starts right from the sowing of the crop till harvest. Damage due to termite may lead to poor germination in crop like sugarcane, wheat, gram, maize, cotton, groundnut, chilies etc. However, their incidence in grown up plants, the yields are reduced drastically because the losses inflicted at or near maturity cannot be compensated. Mostly the termites live in underground nest with the ramification of galleries in which they move about, it is rather difficult to locate and reach them. So before the adoption of integrated management approach it is essential to know about the life cycle of the pest.
6. **Armyworm:** *Mythimna separata* (Lepidoptera: Noctuidae) is a pest of wheat and is prevalent in U.P, Bihar, Rajasthan, and Punjab. The adult moths are stoutly build and pale brown in colour. Larvae have three, orange, white and brown stripes running the length of each side. The larvae will also have a narrow broken stripe down the center of its back. The presence of black spots located at the top of the four pairs of prolegs. The major damage to the seedlings is caused by caterpillars which move in swarm. After destroying crop of one field, they move to the other crop. The caterpillars feed upon the leaves of the seedlings and devour the ear heads as a result further growth of the plant ceases. They infest spring wheat fields primarily, although winter wheat and spring barley may also be affected. The larva generally feed at night and early in the morning. They hang upside down from the slender bristles on the head (awns).
7. **Pod Borer:** Pod borer, *Helicoverpa armigera* (Noctuidae; Lepidoptera) is a polyphagous pest, infesting gram, lablab, safflower, chilies, groundnut, tobacco, cotton, wheat etc. Caterpillars are of varying colour, initially brown and later turn greenish with darker broken lines along the side of the body. Moth is stout, medium sized with brownish/greyish forewings with a dark cross band near outer margin and dark spots near costal margins, with a wing expanse. Young larva feeds on the leaves for some time and then attacks earheads. Internal tissues are eaten severely and completely hollowed out. While feeding the caterpillar thrust its head inside leaving the rest of the body outside.

8. **Brown stink bug:** Brown stink bugs are medium to large-sized bugs. Those that attack small grains are commonly grey brown to green in color and 0.38 to 0.5 inch long. Their bodies have a characteristic shield shape with a large triangle on the center back. Stink bug infest winter wheat during grain development in the spring and are a concern for two reasons. Firstly, they may directly damage the wheat grain. More importantly, stink bugs may move as wheat matures to adjacent crops such as corn and vegetables where they may cause damage to seedling plants. Wheat is most sensitive to stink bug feeding injury during the milk stage. Threshold is 1 bug per square foot at milk stage. Despite being very visible on maturing heads, stink bugs number almost always are much below this threshold. Control during medium to hard dough stage is not justified.
9. **Brown wheat mite:** *Petrobia lateans* (Arachnida: Tetranychidae) occur in wheat in the summer rainfall regions and expected to be severe where drought conditions are frequently encountered. It is a pest of drier areas and is serious under rainfed condition but its incidence in the irrigated crops has been reported. The extent of damage to the crop is dependent upon the severity of incidence. Individual mites are too small to be visible with the naked eye without effort. Adults are light brown in colour. The brown wheat mite feeds on sap from leaves by inserting two needle-like stylets into the leaf thereby withdrawing nutrients from the plant. During high mite populations the leaves may have a bronze appearance with some leaves even dying off as a result of intense feeding. They have a tendency to feed on the tips of the leaves, causing them to dry out and die. Heavily infested fields present a scorched withered appearance. It is also responsible for the transmission of barley yellow streak mosaic virus disease.

Management Strategies

- **Monitoring:** Regular field scouting is essential for early detection of insect infestations. Monitoring can be done through visual inspection or by using pheromone traps for specific pests.
- **Cultural Practices:** Crop rotation, planting resistant varieties, and optimizing planting dates can help reduce insect pressure. Avoiding excessive nitrogen fertilization can also minimize attractiveness to certain pests.
- **Biological Control:** Encouraging natural enemies such as predatory insects, parasitoids, and pathogens can help keep pest populations in check. Conservation of natural habitats and use of biopesticides can promote biological control.
- **Chemical Control:** Insecticides are a last resort and should be used judiciously to minimize environmental impact and avoid resistance development. Application timing should target vulnerable stages of insect development.
- **Integrated Pest Management (IPM):** Implementing a holistic approach that combines multiple control tactics based on ecological principles is the key to sustainable insect management in wheat production.

Conclusion

Crop losses due to pests and diseases are a major threat to the incomes and food security of thousands of rural families worldwide. The assessment of crop losses (yield and economic losses) and their causes is needed to improve the development of agro ecosystems capable to offer good crop yields, regulation of pests and diseases, and other ecosystem services. Insect damage remains a significant challenge in wheat production, but proactive management strategies can help mitigate losses and sustain crop productivity. By understanding insect biology, adopting cultural practices, and integrating various control measures, farmers can effectively manage insect pests while minimizing reliance on chemical inputs. Collaboration between researchers, extension services, and farmers is essential for developing and disseminating integrated pest management strategies tailored to local conditions.