

Lecture 03

Cereal Crop Insects

Include the following crops: (Wheat, Barley, Rice and Corn)

The Insects of Cereal Crops:

1- Sunn Pest (Sunn Bug)

Eurygaster integriceps (Hemiptera: Scutelleridae)

Distribution:

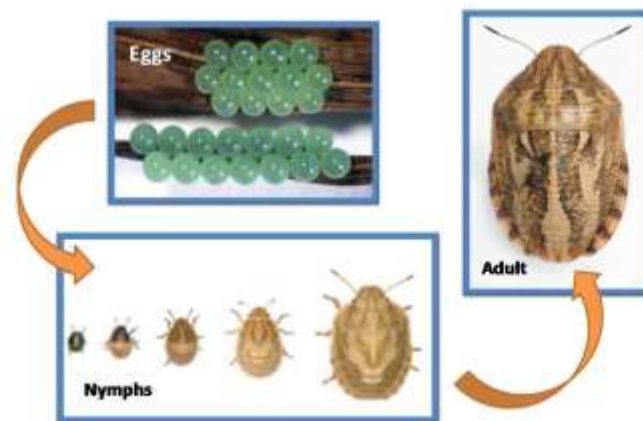
Northern Africa, Bulgaria, Albania, Greece and also in Turkey, Syria, Iran, Iraq, Palestine, Saudi Arabia, Afghanistan and in the north of Pakistan, where sometimes harmful. Distributed in Kazakhstan and Ukraine; in Russia spread in Northern Caucasus, and also in the Chelyabinsk Region and Bashkortostan.

Host Plants:

Wheat, Barley and Oats.

Life Cycle:

Average life duration, 28-31 days. Fertility 28-42 eggs, maximum 146-182. **Eggs** are located in two regular rows with 7 eggs in a row (2-3 batches on the average, maximum 13 or 14) on the lower side of leaves, on stalks, on weed vegetation, sometimes on ground lumps. Fertility depends both on abiotic conditions, and on phase of development of grain cereals during feeding. Duration of egg development, 6 to 28 days. Development of 5 **Nymphal** instars passes 20 to 45 days on grain crops, beginning from booting to the end of dough development. Air temperature 20-24 degrees C and precipitation about 25-35 mm per month are optimal for their development.



Sunn Pest (Sun Bug)
Eurygaster integriceps (Hemiptera: Scutelleridae)

Control Methods:

- Mechanical Control:

Collect Sunn Pest from overwintering sites and cereal fields:

The insects can be easily collected by hand from wheat fields early in the season, before their eggs have been laid and from overwintering sites. Pest Control Departments in some countries offer financial incentives in return for collected insects. This may encourage farmers to take up the collection process.

- Cultural Control

1- Use of early-maturing varieties:

Early planting of wheat using early maturing varieties maximizes use of rain water; helps in early maturity and harvest of the crop; and prevents significant losses by the breaking cycle of the insect pest peak feeding and heading.

2- Harvest your crop early:

The wheat crop should be harvested as soon as it reaches maturity or it will be prone to Sunn Pest damage.

- Biological Control

The first method of biological control used against *E. integriceps* was zoophagous parasitoids. In Iran, in 1950, 21 million zoophagous parasitoids were released. Overwintering adults were collected and the parasitoids reared on their eggs which were subsequently released into the wheat crop. Parasitization of *E. integriceps* eggs may be as high as 30-80%, but depends on many factors, such as climate.

- Chemical Control

1. Ground spraying of wheat fields is the most effective application method. Aerial spraying should be restricted to large areas or those in which ground application is difficult to apply.
2. Use proper protective clothes, including a mask and gloves during pesticides application.
3. Apply pesticides when the weather is relatively cool and calm.

2- Wheat Thrips

Haplothrips tritici (Thysanoptera: Phlaeothripidae)

Distribution:

Occurs in Siberia, Kazakhstan and Asia.

Host Plants:

Wheat, barley, maize and Oats.

Life cycle:

Adults overwinter in plant debris, under bark, and in other protected areas. The adults become active in April and May and lay **eggs** in host plant tissues. **Nymphs** hatch from the eggs and enter two instars before entering the soil. Adults are active from mid-May through September. Under favorable conditions, a complete life cycle may require only two weeks.

**Control Methods:****- Cultural Control**

Lower densities of *H. tritici* were recorded in winter wheat fertilized with nitrogen alone or with a mixture of nitrogen, phosphorus and potassium.

- Biological Control

Reported that two predators, *Aeolothrips intermedius* and *Paratinus femoralis* were frequently used in reducing numbers of *H. tritici* eggs and nymphs in Ukraine.

Indicated that most effective *H. tritici* natural enemies attack the nymphs and eggs.

- Chemical Control

Due to the variable regulations around (de-)registration of pesticides, we are for the moment not including any specific chemical control recommendations.

3- Wheat Aphid

Toxoptera (Schizaphis) graminum (Homoptera: Aphididae)

Distribution:

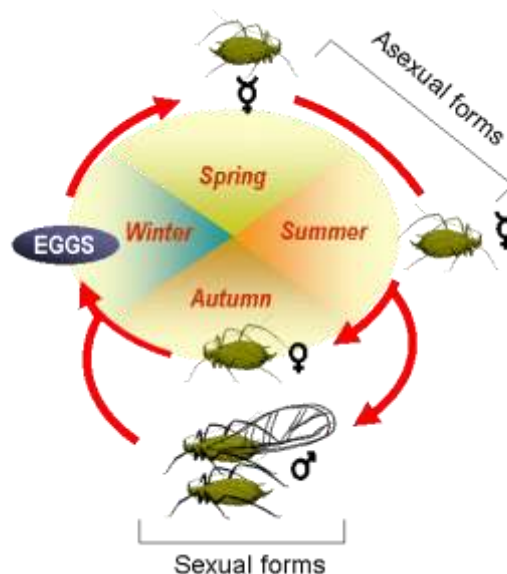
The insect is widespread in South Europe, Middle, Central and Minor Asia, North and South America, West and South Africa, Japan.

Host Plants:

The host range of Wheat Aphid includes 70 graminaceous species. The aphid develops on species in the genera *Agropyron* (wheat grass), *Avena* (oat), *Hordeum* (barley), *Lolium*, *Oryza* (rice), *Panicum* (Sorghum), *Triticum* (wheat) and *Zea* (maize).

Life Cycle:

The aphid life cycle includes one host-plant. Overwintering takes place in the **egg** phase on winter cereals, and also on cereal weeds. In areas where the pest is particularly harmful, **nymphs** hatch during the end of April, the beginning of May. The nymphal period lasts 8-15 days. The life span of the apterous parthenogenetic **female** is about 35 days. Female can produce as many as 80 nymphs. The aphid feeds on winter cereals at first, and then on spring corn. Winged settling females appear at the end of May. The life span of winged parthenogenetic female is from 17 to 20 days. When the young growth of winter cereals appear, aphids migrate from summer reservations. At the end of September, beginning of October, viviparous individuals are marked that give birth to females and males. Eggs are laid in October till early frost in groups of 2-4 eggs in leaf sheaths. The fecundity of female varies from 10 to 12 eggs, and the life span lasts 38-40 days.



Control Methods:

- **Natural Enemies**

Ladybird beetle adults and larvae (Coccinellidae), flower fly larvae (Syrphidae), lacewings (Chrysopidae), ground beetles (Carabidae), parasitic wasps, spiders and fungal pathogens all have a regulating effect on aphid populations. However, aphid develops and reproduces faster at lower temperatures than do their natural enemies, which allows them to reach damaging levels early in the season before natural enemies can reach their potential.

- **Chemical Methods:**

Control measures include eradication of weeds and insecticide treatments at the end of May and in June.

4- Wheat Ground Beetle ***Zabrus tenebrioides* (Coleoptera: Carabidae)**

Distribution:

Occurs in Southern Sweden, Northern Africa, Minor Asia, Cyprus, Ukraine, Moldova, Russia and Kazakhstan.

Host Plants:

Wheat, Barley and, more rarely Oats.

Life Cycle:

The **eggs** are deposited in clusters of 3 to 5 in a small gallery. Average fecundity 80 to 100 eggs. Egg development lasts 2 to 3 weeks. **Larva** excavates a deep and narrow burrow up to 30cm in the ground in which it takes refuge during the day. Larval damage appears in November on young cereals. During winter, larval activity slows down and resumes with heightened intensity in spring. **Pupa** in May, after which the new adult emerge. Pupation at the extremity of the gallery. **Adult** quite active, it flies at a small distance above the ground and disperses over cereal crops. It gnaws the flowers and the young seeds during the night and hides under clods of earth or under plants during the day. The adult emerges in June; egg laying begins shortly after and lasts until the end of autumn.



Control Methods:

The usual insecticidal treatment recommended were the use of seed dressings of aldrin or dieldrin. Diazinon sprays can be applied to the soil before planting, and also the spraying of young sugarcane stools is recommended when one or more adult beetles are found in 20 damaged stools.