

# Insect Pests

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Under favorable conditions, several insects can cause significant yield loss in wheat. They can reduce plant vigor by removing sap or lower yields indirectly by feeding on leaf tissue. Some insects occasionally feed directly on grain heads or clip plant stems so that the grain head falls to the ground. Fortunately, the probability of severe infestations is relatively low if sound management practices, such as crop rotation and use of the fly-free planting date, are followed. Early detection, correct identification, and assessment of pest problems allow appropriate management decisions to be made. Regular field monitoring is the best means of having the information needed to follow the recommended treatment guidelines. The small grain insect scouting calendar (Figure 8-1) indicates when pests are most likely to be present in a field.

## Field Scouting

Field scouting procedures differ among the key pests. However, you will look at three sites in fields up to 20 acres in size, and add one site for each additional 10 acres. For example, there would be five locations in a 50-acre field—three sites for the first 20 acres and two more for the additional 20. Using the appropriate method ensures that you collect information that can be compared directly to the treatment guideline for that specific pest. For example, aphid control prior to emergence of the flag leaf is based on the average number of aphids per foot of row. A rating system is used for these insects after the head emerges. The need for cereal leaf beetle control is determined by the average number of adults and/or larvae per stem.

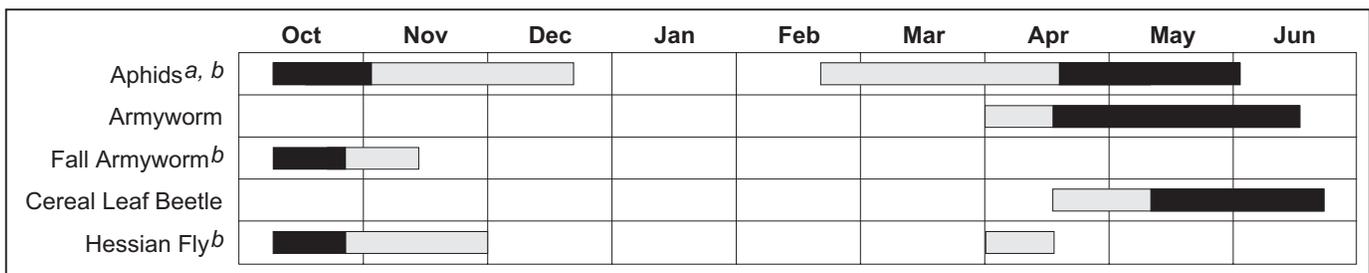
## Key Factors

Planting date and weather are two key factors that influence pest activity. Planting after the fly-free date reduces the potential for damage from both the Hessian fly and aphids in the fall. A killing frost before planting eliminates large numbers of these insects so that they are not present to move into the fields. Also, abnormally long, warm falls or early springs favor aphid reproduction and can allow damaging numbers to develop from just a few individuals.

## Insecticide Selection

Insecticide applications are valuable in quickly reducing pest infestations that could reduce yield or quality. Read the label before purchasing and applying any pesticide. Use the lowest rates consistent with the severity of the infestation and size of the insects present. The label may recommend low rates for light to moderate infestations or insects in the early stages of development and high rates for severe infestations or pests in late, more damaging stages. Use selective insecticides when possible to minimize the effect on beneficial species that may be present. If using tank mixes, read the labels of all products in the combination. For example, sulfonylurea herbicides should not be applied with or near to the time that organophosphate insecticides are used. This combination can cause a variety of problems from temporary plant injury to yield reduction.

**Figure 8-1. Small grain insect scouting calendar.**



The black portion of the bars above indicate periods of possible economic populations.

<sup>a</sup> Early planting and warm fall weather increases potential for aphids and barley yellow dwarf virus.

<sup>b</sup> Wheat planted before Oct. 15 is subject to attack by this insect.

## Major Pests

### Aphids

Adults and nymphs can damage plants any time after emergence. Sap feeding by large numbers of aphids can reduce stands during late fall and early spring. Head feeding during late spring and early summer can cause shriveled, lightweight kernels. Corn leaf aphids and bird-cherry oat aphids are common in the fall; English grain aphids are most abundant in the spring. Occasionally greenbugs can be found, but this destructive species is relatively rare in Kentucky. Any of these species can carry barley yellow dwarf virus. The bird-cherry oat aphid is the most important vector.



**Plate 8-1.** A greenbug (left) and a bird-cherry oat aphid (right). Bird-cherry oat aphids, common in the fall, are dark green with a red band across the end of the abdomen.



**Plate 8-2.** Parasitized aphids. Note the tan color compared to the green healthy aphids also in the picture. Tiny wasps emerge from these “mummified” aphids and sting healthy ones.

### Armyworm and Fall Armyworm

Armyworms usually occur in late April and early May. Most of the feeding damage occurs from late May through early June. Leaf feeding starts at the edge and progresses inward, leaving a scalloped appearance to the leaves. While this damage can reduce yields, the most serious injury losses result when armyworms chew through stems and clip off the grain heads.

In some years, fall armyworms can destroy stands of small grains in the fall. Damage is possible from early September until the first heavy freeze.

### Cereal Leaf Beetle

More of a problem on oats than wheat, overwintering adults can be seen on the leaves from early April until mid May. Eggs are laid from mid April until late May; the larvae are active and feeding from late April through mid June. Both adults and larvae remove long, narrow strips of tissue from the upper surface of plant leaves, producing a distinct symptom of long, white scars. (See *Entfact 107: Cereal Leaf Beetle in Kentucky Wheat* for more information.)

### Hessian Fly

In the past, fall infestations of this pest have severely damaged wheat by causing stand reduction. Both stand loss and lodging of the plants can be seen in the spring. You can reduce damage greatly by following the recommended fly-free planting date for your area and using resistant varieties (see *Entfact 101: Hessian Fly in Kentucky*). Check for the pupal (flaxseed) stage on weakened seedlings (October through March) or for the small, white, maggot-like larvae in leaf sheaths during May.

## Scouting Procedures

### Aphids

Plates 8-1 and 8-2

**Occurrence:** Aphids can damage plants any time after plant emergence.

**Description:** Aphids are small, soft-bodied, pear-shaped insects. Their piercing-sucking mouthparts look like a small tube arising from under the head. Color varies from green to blue to yellow.

**Damage:** Feeding by aphids commonly found in Kentucky can cause two types of damage: direct damage of the aphid feeding on the plant and indirect damage as a result of moving a plant virus (primarily barley yellow dwarf virus) into the plants. Damage due to direct feeding is usually confined to the “head filling” stage and causes low test weights. BYDV damage results in stunting and yellowing of the plants and can result in severe yield loss.

Always be on the lookout for new aphid pests. Currently, feeding by aphids in Kentucky produces little visible damage during the time of feeding. If you see aphid-infested plants that are dead or dying or have tightly rolled leaves and/or severe yellowing, collect the aphids and have them identified. The yellow sugarcane aphid and Russian wheat aphid currently are *not* present in Kentucky but are nevertheless potential major pests.

**When to scout:** Fall until temperatures remain below about 45°F and again in the spring when temperatures regularly exceed 45°F.

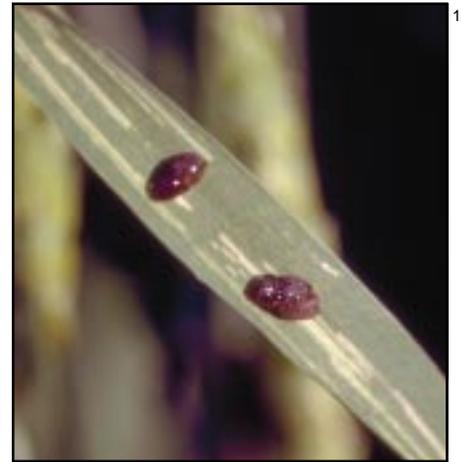
**How to scout:** Scout in the fall and in the spring before leaf emergence (Feekes 8). At each location examine three 1-foot lengths of row. Count the number of aphids on each subsample. Look over the entire plant, especially near the



**Plate 8-3.** Fall armyworms feed on emerging tillers.



**Plate 8-4.** True armyworms feed on the leaves and may clip awns.



**Plate 8-5.** Cereal leaf beetle larvae produce long white streaks on the upper leaf surface. The light yellow, grub-like larvae are covered with brown waste material.

soil line. Record the average number of aphids per 1 row foot. This sampling is for making decisions relative to movement of BYDV. Label these records as “Counts.”

In the spring (after heads have emerged) at each location, examine ten heads for the presence of aphids. Record a rating of infestation based on the number of aphids per head:

Rating	Numbers of aphids
0 - none	none
1 - slight	< 50
2 - moderate	50-100
3 - severe	> 100

This examination is for direct damage done by aphids to grain test weights. Label these records as “Ratings.”

**Economic threshold:** In the fall and spring when estimating risk of BYDV, consider a control if aphid “counts” average ten or more aphids per row foot. (Consult *Entfact 121: Aphids and Barley Yellow Dwarf on Kentucky Wheat.*) In the spring during “headfilling,” when using the rating scale for direct aphid damage, consider a control if an average rating of 2 (moderate) or greater is recorded.

### Armyworm

Plates 8-3 and 8-4

**Occurrence:** Mid April to late May. Luxuriant or lodged vegetation in low, wet areas is especially susceptible to attack. Cool, wet springs favor armyworms.

**Description:** Larvae are greenish brown with a narrow stripe down the middle of the back and two orange stripes along each side. The yellowish head is honeycombed with dark lines. Armyworms are about 1½ inches long when full grown.

**Damage:** Armyworms are primarily leaf feeders, but they will feed on awns and tender kernels and may clip off the seed head. Infestations are more common in barley than in wheat. Armyworms may feed on oats, rye, and some forages.

**When to scout:** Mid April through harvest.

**How to scout:** Scout each field at least once a week. Sample the entire field using the number of sites as determined by the “Field Scouting” section (page 38).

First, check field margins and lodged grain. If armyworms are present, begin surveying in the standing grain. Armyworms feed during late afternoon, night, and early morning. They may be on the ground when you are in the field.

Enter *at least* 30 paces into the field before sampling. Pick sample spots randomly. Look at the leaves for signs of chewing damage. Armyworms feed from the edge of the leaf toward the mid rib. Examine the ground for dark fecal droppings. During the day, armyworms usually hide under surface litter or in soil cracks. Note average larval length. Walk to the remaining locations, and repeat the process.

**Record:** Record the number of worms present in each 4-square-foot area sampled. Note the average length of the armyworms in each area.

**Economic threshold:** An average of 16 ½- to ¾-inch-long armyworms per 4-square-foot sample.

**Comments:** Armyworms longer than 1 inch may have completed most of their feeding. If the grain is nearly mature and no head clipping has occurred, controls are *not* advised. Warm spring weather favors parasites and diseases that attack armyworms. Note on your scouting report the percentage of worms parasitized or diseased.



**Plate 8-6.** Adult cereal leaf beetle, with red thorax and blue-black wing covers, about 3/16 inch long.



**Plate 8-7.** Hessian fly-infested plants (center) appear stunted. There is no stem elongation and the leaves are usually broad and green.



**Plate 8-8.** The “flaxseed” or pupal stage of the Hessian fly can be found behind lower leaf sheaths of infested plants or below the soil line.

### *Cereal Leaf Beetle*

Plates 8-5 and 8-6

**Occurrence:** April to maturity.

**Description:** Adults are shiny black beetles with red legs and thoraxes, approximately ½ inch long. Larvae are pale yellow and soft bodied. They “glue” pieces of trash and leaf on their backs as camouflage.

**Damage:** Adults and larvae eat out long, narrow strips of tissue between veins.

**When to scout:** April until maturity.

**How to scout:** Check ten stems per sample site for larvae or adults.

**Record:** Record the total number of larvae and adults found on the ten stems examined at each sample site. Calculate and note the average number per stem.

**Economic threshold:** Controls may be warranted when there is an average of more than one larva and/or adult per stem.

### *Hessian Fly*

Plates 8-7, 8-8, and 8-9

**Occurrence:** Fall and spring.

**Description:** The Hessian fly adult is a small, fragile fly. The larva is a very small, white, legless maggot. The larval stage is damaging and may be found between the leaf sheath and stalk. However, the pupal (flaxseed) stage may be found if an infestation has occurred. This is a small, brown, seed-like pupal case, usually found at the base of the plant between the leaf sheath and stalk.



**Plate 8-9.** Hessian fly adult.

**Damage:** A fall infestation can result in stand loss and broken (lodged) plants. Spring infestation usually results in plants of reduced vigor and bad color.

**When to scout:** Survey fields one time after the first frost and from early spring until June.

**How to scout:** Look for thin, stunted, chlorotic patches in the field. Examine the base of these plants for presence of the flaxseed.

**Record:** Record the number of flaxseed found per ten stems examined at each sample site. Note the presence of adults or larvae.

**Economic threshold:** There is no rescue treatment; however, preventive measures may be used to avoid future infestations.