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Corn Insects - Quick Reference Guide

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This publication provides abbreviated information on the economically important corn insect pests found in Nebraska. It is organized into early-season and late-season categories. It provides a brief description of the insect, damage symptoms, incidence, sampling scheme, and economic thresholds (if available) for each pest. Additional information also can be found at the UNL Entomology Department Web site (*http://entomology.unl.edu*) and in UNL's Crop Watch newsletter (*http://cropwatch.unl.edu*)

EARLY SEASON

Insect	*Brief Description*	*Damage Symptoms*	*Incidence*	*Sampling Scheme*	*Economic Threshold*
Seed corn maggot	The maggots are yellowish-white, ~ 1/4" long, sharply pointed at the head end, legless, and tough-skinned.	Maggots feed inside the kernel; either the seed fails to germinate or the seedling is weak.	April and May (statewide)	Check for seeds in soil after planting. Dig two linear feet of row in five locations where skips in seedling stand occur. Examine seed for maggots and feeding damage.	Unavailable. If damage is severe early, may need to replant.
Seed corn beetle	Beetles are dark brown with a lighter brown border stripe on the wing covers, or a uniform brown; ~1/4" to 1/3" long.	Beetles feed inside the corn seed below the soil surface. Seeds fail to germinate.	April and May (statewide)	Check for seeds in soil after planting. Dig two linear feet of row in five locations where skips in seedling stand occur. Examine seed for beetles.	Unavailable. If damage is severe early, may need to replant.

Insect	*Brief Description*	*Damage Symptoms*	*Incidence*	*Sampling Scheme*	*Economic Threshold*
White grubs	Generally white with a brown head, a C-shaped body, and three pairs of short legs. True white grubs (*Phyllophaga*) have two parallel rows of spines on the underside of the last abdominal segment; annual white grubs (*Cyclocephala*) have no detectable pattern of spines.	*Phyllophaga* grubs can seriously damage corn by feeding on roots and root hairs. Damaged plants may be stunted or die. Many species of "white grubs" feed on organic matter. Cyclocephala grubs rarely cause economic damage.	May and June (statewide)	Dig up several damaged plants and examine roots and surrounding soil for white grubs.	Unavailable. If damage is severe early, may need to replant.
Black cutworm	Larvae are dark gray to brown above with faint lighter stripes. Skin has strongly convex, rounded granules of varying sizes (like sandpaper).	Foliage feeder in early stages, cuts plants off below ground in later stages.	May through June (primarily eastern 1/3 of state, along Missouri River)	Count wilting or cut plants in 20 feet of row in several spots in the field.	Treat when 5% of plants are damaged or cut, and larvae are < 1/2" long.
Dingy cutworm	Larvae are dull dingy brown with a broad buff gray dorsal stripe subdivided into triangular areas on each segment and bordered by a narrow dark stripe on each side. Skin granules are round, coarse and isolated.	Mostly feeds above the ground on foliage. May cut plants off at or below soil surface; damage usually not serious because it normally is above plant's growing point.	April through June (statewide)	Rarely necessary.	Often not economic because the insect completes feeding and development before the plant's growing point is close to soil surface. Identification critical.
Wireworms	Larvae are hard-bodied, light tan to reddish tan, long, flat or nearly rounded. Up to 1" long.	Feeds inside the seed before germination or in plant below the soil line in seedling corn. Seed or seedling may be weakened or killed.	April, May, and June (statewide)	Baited traps: 1/2 cup each untreated wheat and corn placed ~ 4" deep in the soil; cover with small sheet black plastic and cover the black plastic with clear plastic. Trap left in soil undisturbed for 2-3 weeks before planting can predict wireworm damage potential.	Average of one or more wireworms per baited trap indicates the potential for economic damage. Planting time insecticides are available. If damage is severe early, may need to replant.

Insect	*Brief Description*	*Damage Symptoms*	*Incidence*	*Sampling Scheme*	*Economic Threshold*
Flea beetles	Small, shiny black, stout-bodied beetle with black legs adapted for jumping, ~ 1/16" long.	Feeds on leaves; causes narrow white strips by scraping off the green tissue between veins. May transmit Stewart's wilt.	May and into June (primarily eastern and southern Nebraska)	Count flea beetles on 25 corn plants in each of several locations in the field. Rate leaf according to scraping damage.	Four to five flea beetles per plant and corn < 6" tall, or leaves of seedlings with 30% of the green tissue removed and corn <3-leaf stage.
Chinch bugs	Fully grown chinch bugs are ~ 3/16" long, with black body and white forewings. Newly hatched bugs are very small and bright red. There are five nymphal instars.	Injures plants by sucking plant juices, causing stress on the plant. Feeding can occur at crowns and below soil surface on roots and stems of small plants; later, bugs may feed on stems behind leaf sheaths.	Throughout the growing season, primarily southeastern and southcentral Nebraska. Populations build up during dry years.	Inspect border rows of cornfields planted near ripening small grains for chinch bug migration. Examine 25 plants in at least 4 locations in field for reddish nymphs or black and white adults feeding on leaves or stems below soil surface. In June, examine plants near ripening small grains. In August, may be anywhere in field.	10 or more on 3" plants. 50 or more 12" plants. Economic threshold lower if plants are under stress.
Sod webworm	Larvae are short, rather thick-bodied, usually spotted and coarse-haired, active worms, from ~1/4" to 3/4" long. Will be found in webbed or silk-lined tunnels usually adjacent to corn plant.	Usually in first year corn out of pasture or sod — small corn plants cut off near surface of ground as if attacked by cutworms. Often feeding occurs when growing point is below ground and damaged plants recover.	May and June, generally, north-central and western Nebraska where corn grows in sandier soils; may occur elsewhere where similar soil conditions exist.	Count wilting or cut plants in 20 feet of row in each of several locations in the field.	Unavailable. Use same threshold as for black cutworms.
Corn rootworm larvae	Small whitish larvae up to 1/2" long with black to dark brown head and anal plate.	Feeds on and tunnels into roots of corn plants.	Late May, June, and mid-July (statewide)	Dig up 2 plants at each of 5 locations with the soil from 6-8" around the plant. Sift soil over a sheet of black plastic looking for 1/32" to 1/2" long larvae.	None available. An average of 2-3 larvae per plant has been used by some consultants to determine need for control.

Insect	*Brief Description*	*Damage Symptoms*	*Incidence*	*Sampling Scheme*	*Economic Threshold*
First generation European corn borer (ECB)	Whitish-gray caterpillar with small black spots on body and shiny black head. From 1/8-1" long.	Feeds on leaves in whorl of corn, then bores into stalk when half-grown. Survival reduced in corn under 6-leaf stage.	Late June into early July; wherever corn is grown in Nebraska	Examine at least 25 corn plants in each of 4 locations in each field. Note the percent of total plant whorls with feeding damage; unroll several damaged whorls, record number of live worms/ plant. Note size of worms.	Depends on price of corn, yield potential, cost of application, and number of larvae, 3-5% loss per borer that reaches maturity per plant.
Corn leaf aphids	Small (1/16" long), blue/ green, usually wingless insects in the whorl and tassel.	Feeds by sucking juices from corn plant; does not inject salivary toxins. May transmit maize dwarf mosaic virus.	Throughout season (statewide)	Examine five sets of 20 plants during late whorl stage and tassel emergence.	15-30 aphids per plant 14-21 days before tasselling may indicate the need to treat; populations often decline after tassel emergence.
Corn root aphids	Small (1/16" long), bluish-green to grayish-green, spherical aphids.	Feeds below ground on corn roots. Infested plants are stunted, may wilt, become yellow and die. Most severe injury in dry years.	Throughout growing season	Dig up 2 row feet of plants at 5 locations in a field. Record number of plants with live aphids and showing symptoms.	No economic thresholds developed. If damage is severe early, may need to replant.
Stalk borer	Young larvae are purple to black, with prominent longitudinal white stripes at front and rear ends of body. Stripes are interrupted at mid-body by a solid dark purple to black area on the third thoracic segment and first three abdominal segments. Fully grown larvae are uniformly dirty gray.	Larval damage results in deformed or stunted plants caused by either burrowing into the base of the plant and tunneling upward through the center of the stalk or entering through the whorl and tunneling down.	June through early July	Dissect plants in field borders. Check for larvae in corn at 1,400-1,700 degrees days (41°F base) from Jan. 1.	Generally a pest only in field borders. Economic thresholds vary from 15-50% infested plants, depending on plant stage and corn value.
Brown stink bug	Adults, light brown, shield shaped, 2/5-3/5" long, 1/3" wide.	Adults feed on base of seedling plants, causing growth distortion and holes in leaves.	Statewide; May-August	Check 10 consecutive plants in 5 or more locations in field.	None established; 5% damaged plants may warrant treatment.

LATE-SEASON

Insect	*Brief Description*	*Damage Symptoms*	*Incidence*	*Sampling Scheme*	*Economic Threshold*
Second generation European corn borer (ECB)	See first generation above.	Initially feeds on pollen in leaf axil, ear tip, etc. If pollen is unavailable, borer will move around to sheath and collar area to feed. Later bores into stalk.	Late July, August, and sometimes early September. The larvae overwinter wherever corn is grown.	Look for fields pollinating during early 2nd ECB moth flights. Inspect 10 plants in at least 5 locations, counting egg masses on underside of leaf, and larvae in leaf axils and ear tips.	25-50% of plants with an egg mass and corn at blister stage or earlier.
Two-spotted spider mite (TSM)	Mature TSM are ~ 1/32" long, with two well-defined spots near the front of the body. TSM is somewhat larger and more robust than BGM.	Mites destroy individual cells on undersides of leaves, causing yellow spots; in severe cases leaf death occurs. TSM tends to occur over the entire plant as populations increase.	May be present throughout the growing season, particularly in drought-stressed field areas. Most common in July, August, and into September (statewide).	Examine the undersides of the leaves of several plants in several different parts of the field. Note the mite species present, the distribution of colonies and the amount of injury.	For TSM only or TSM + BGM, 15-20% of total leaf area with active TSM colonies and moderate damage apparent.
Banks grass mite (BGM)	BGM pigmentation extends along the entire length of the body. BGM appear narrower and slightly flatter.	BGM populations tend to start at bottom of plant and move up.	BGM often appear earlier than TSM	Same as above.	For BGM only. One lower leaf yellowing and colonies present up to the ear zone.
Grasshoppers	From 1/5 to >1.5" long. Front pair of wings are leathery; immature stages lack wings. Color varies with species, yellow, green to tan; hind legs well developed for jumping.	Grasshopper injury to corn consists primarily of leaf feeding. Heavy losses may occur from feeding on plant stems or ripening kernels of grain.	Throughout the latter half of the growing season, particularly following several dry years (statewide).	Count numbers of grasshoppers per square yard as you move through the field or field margin.	Within the field, 3-7, 8-14, 15 or more hoppers per sq yd; in field margins, 11-20, 21-40, and more than 40, indicate light, moderate, or heavy populations, respectively.
Armyworm	Dark green worms up to 1 1/2" long, with several yellow and orange stripes on sides and down middle of back. Heads are brown with honeycomb shaped markings.	Feeds on leaves, sometimes only leaving the mid-rib. If field not infested with grassy weeds, infestation usually starts on edge of field, with worms moving in from grassy areas.	Usually July-September, but may be anytime during season (statewide)	Larvae feed at night so worms often are not detected until damage present. Check grassy and low lying areas around or in fields. Hailed fields may be at risk because of grassy weed growth.	Treat when feeding is causing the loss of two lower leaves before hard dent stage.

Insect	*Brief Description*	*Damage Symptoms*	*Incidence*	*Sampling Scheme*	*Economic Threshold*
Variegated cutworm	Larvae found in several colors, with a distinct pale yellow diamond-shaped dot on the mid-dorsal line of most of the segments.	Feeds on variety of crops; sometimes can be found feeding at the tip of the corn ear. Economic damage is rare.	August(statewide)	Examine 25 eartips in each of several areas of the field.	Unavailable.
Western bean cutworm	Eggs laid in masses on the upper side of the leaf. Eggs are pearly white when laid, but by hatching time (4-7 days later are bluish-black. Young cutworms are dark brown with faint diamond-shaped markings on their backs. Older larvae change to lighter color; by maturity, they're gray to pinkish brown and three short, white stripes run lengthwise on the first segment behind the head.	Larvae feed on grain in ear; multiple cutworms may occur in single ear greatly reducing grain yield.	July, August, and September (primarily sandy soil areas of Nebraska)	Examine upper surface of upper leaves for eggs; the tassel, leaf axils, and ear tips for young larvae on 10 plants in 5 or more different parts of the field.	Treat if 8% of plants are infested with newly hatched larvae in tassels and/or eggs on leaves, and corn is at least 95% tasseled. If corn is at milk stage before eggs are laid, no treatment needed.
Corn earworm	Color varies from yellow or pink to green, sometimes almost black. Body usually marked with alternative light and dark strips. Skin covered with microspines. May be confused with western bean cutworm.	Eggs laid singly on silks and newly hatched larvae tunnel into ears where they feed on developing kernels. Feeding usually starts at the ear tip and works downward. Usually only one mature larva develops per ear.	Late July, August, and September (statewide)	Examine silks for egg presence during green silking period. Examine eartips for small larvae. Pheromone trapping for moths can be used to pinpoint time to sample intensively.	Treatment not economically justified for field corn. Seed corn, popcorn and sweet corn may require treatment.
Fall armyworm	General appearance similar to armyworm. On the head is a white, upside-down, Y-shaped marking that clearly distinguishes it from the armyworm.	Larvae feed in ears, and on leaves. Damage similar to the corn earworm, but not usually as severe.	Late July, August, and September (statewide)	Examine ear tips.	Unavailable.

Insect	*Brief Description*	*Damage Symptoms*	*Incidence*	*Sampling Scheme*	*Economic Threshold*
Western corn rootworm (WCR) adults	Female WCR beetles are yellow with black stripes; male beetles vary from striped to nearly black. They are ~ 1/6" to 1/4" long.	Adult beetles begin emerging in July and begin feeding on corn leaves, producing white, parchment-like areas. Beetles later feed on silks and pollen.	July to first frost (statewide)	Examine 50 plants per field, searching over whole plant. Also, unbaited yellow sticky traps may be used; 12 traps per field.	In continuous corn, ~0.75 beetle/plant or 6 beetles/ trap/day may produce an economically damaging rootworm population in corn the following year. Numbers of beetles/plant that may interfere with pollination varies; controls are justified only when severe silk clipping occurs at 25-50% pollen-shed.
Northern corn rootworm (NCR) adults	NCR beetles are green to yellowish green, sometimes almost tan, without stripes. They are about the same size as WCR.	Tend to emerge a little later than WCR but damage is same. Also, feed on pollen of a wide variety of plants.	July, up to first frost (generally common only in northeastern Nebraska)	Not validated, but probably the same as for WCR.	Although not validated, probably same as for WCR. Some research shows 1 WCR=2NCR.
Japanese beetle adult	~ 1/2" long with metallic green head and thorax. A key characteristic is a series of white tufts of hair on each side of the abdomen. Larva; see white grub; has v-shaped arrangement of spines on last abdominal segment.	Adults feed on corn silks; may interfere with pollination if abundant.	July-August; most common in eastern Nebraska	Check 10 consecutive plants in 5 or more locations; adults are often most abundant on field edges.	3 or more per ear, silks have been clipped to less than 1/2", AND pollination is less than 50% complete.
Brown stink bug	Adults; see above. Nymphs similar in color and shape, but smaller, no wings.	Fed on grain through husk; may result in kernel abortion and growth distortion of ear ('banana ears')	Statewide; May-August		None established.

Acknowledgment

Modified from *Corn Insects — Quick Reference*, by R. J. Wright and J. F. Witkowski, 1998, University of Nebraska–Lincoln Extension EC1562.

This publication has been peer reviewed.

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