

UNDERSTANDING AND MANAGING SECONDARY BELOW GROUND

INSECT PESTS ON CORN

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A secondary insect pest is an insect species that, because of a natural or man-made disturbance, has become an economic problem. The focus of this article will be on the below ground insect pests in corn. These insects, especially seedcorn maggot, wireworm and white grub, are difficult to manage because only preventive treatments are effective. An understanding of the insect biology can help target control practices when needed.

Seedcorn maggot: There are several generations of seedcorn maggots/year. The first generation peak adult flight occurs at approximately 360 degree days (Base 39 ° F) and it is this generation which usually causes most of the damage to corn and soybeans planted during a “normal” Wisconsin planting season. That peak adult flight, for southern Wisconsin, occurs late April. The second generation peak (1080 DD) is not likely to occur until Late-May. Late planted field corn, sweet corn and especially soybean will likely be affected by the second generation.

The seedcorn maggot adult fly is about ½ the size of the common housefly. However, it is the maggot that causes crop damage. Seedcorn maggots are cream-colored and do not have legs. Adults are attracted to recently tilled soil as well as green/livestock manure to lay eggs. Maggots will only feed on the seed and unemerged shoots. They will not feed on emerged foliage. Cooler weather will likely increase the amount of damage because of longer exposure during the susceptible (unemerged) stage.

Seedcorn maggot injury is usually random within a field. Symptoms includes both poor emergence and holes in the cotyledon (first leaf) but rarely in the second true leaf. Once the shoot is emerged, that corn plant is unlikely to have economic yield loss. If you have poor emergence, look for the seed to determine if the problem was planter related or seedcorn maggot injury. You may, or may not, find the maggot because of either your response time or because of their short generation time. Finding maggots in sound seed is a good sign of seedcorn maggot feeding because saprophytic maggots (non-pest) will not infest sound (hard) seed. Conversely, if the corn seed is rotten and maggots are found there is a greater likelihood that something else killed the seed and the saprophytic maggots are only feeding on a rotten seed.

Wireworms: Wireworms are hard-shelled, whitish, yellow or copper colored and have three sets of jointed legs. Don't confuse wireworms with millipedes which are a non-pest. Milipedes are dark-gray and have a fringe hair-like legs the length of their body.

Like seedcorn maggots, wireworms will feed on the ungerminated seed but also within the shoot at either above or at the growing point. However, unlike seedcorn maggot, wireworm damage is usually clumped within a field. Above-ground symptoms of the shoot feeding can

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be described as either holes in the newest emerging leaves if the feeding site is above the growing point or wilted whorl leaves if the feeding site is at the growing point. These symptoms are often referred to as “wilted whorl” or “dead-heart.”

There are several species of wireworms and all have multiple year life cycle. Timely scouting will usually result in finding wireworm larvae near some of the damaged plants. However, wireworm larvae will move down within the soil profile during the late-spring and summer months.

Although there are many different species of wireworms that attack corn, their biologies are similar. Wireworms overwinter as either adults or larvae. Adults become active in the spring and females will lay egg in grassy areas including grass sod, pastures, alfalfa and grassy weed infestation in row crops. Eggs hatch in a relatively short period of time and small larvae will begin to feed on grass roots including corn. Depending on the wireworm species present, it may take up to 6 years to complete their life cycle. Damage to second and subsequent corn crops be higher than first year corn.

Symptoms of wireworm damage will usually show up during scheduled stand count or when monitoring for cutworms. Although rescue treatments are ineffective it is important to develop a field history and use a preventive control the following year if corn is to be planted.

For those fields which are rotating out of CRP or sod pasture, the use of solar bait station is advisable, however, this process is very labor intensive. Two stations are recommended per acre starting at least 3 weeks prior to planting. Dig a hole 4 inches deep and 9 inches wide and place ½ cup of a mixture of untreated corn and wheat. Back fill the hole with loose soil and cover with black then clear plastic. An average of 1 wireworm/bait station may indicate an economic population. Developing a field history is important and can help decide if a preventive treatment is needed the following year.

True White Grubs: True white grubs have a 3-year life cycle. Adults are active from late-April through June and will feed on several tree species including aspen, cottonwood and willow. Females usually move from these feeding sites and lay eggs in grassy areas. Eggs hatch within a few weeks. Larvae are c-shaped and cream-colored, range in size from ¼ to > 1 inch and feed for 2 years before pupating. Initially feeding occurs on small corn roots. But as larvae mature, larger roots will be consumed and grubs may burrow into corn plants below ground. Because of the root feeding, above ground symptoms may be similar to other plant stresses including nutrient deficiency, seeding diseases and perhaps herbicide injury. If larvae burrow into the below ground shoot, above ground symptoms are usually described as “dead-heart” or with advanced feeding the entire plant is wilted. These symptoms may be similar in appearance to wireworm, black cutworm, stalk bore and hop vine borer. Scouting is important to develop a field history which could indicate if a preventative treatment is needed the following year. If significant number of first year larvae are present a soil insecticide or seed treatment may be economical in next year’s corn field. Damage to soybean is uncommon as is damage to corn after soybean.