

AGRONOMIC ALERT



EARLY CORN INSECTS AND SEEDLING DISEASE

Corn planted this season has not had the easiest of beginnings. Cool temperatures, coupled with really wet soil conditions can lead to a variety of problems for a corn seed trying to germinate and emerge. Insects such as wireworm and seedcorn maggot along with seedling diseases should be on a grower's mind when examining corn stands and emergence this spring.

As a corn seed germinates, proteins and sugars leak from the areas where the radical and coleoptile emerge. These proteins and sugars provide food for soil fungi, while the tears in the seed coat allow an entryway for insects and soil pathogens.

Early Corn Insects

Wireworm Identification & Damage

Larvae are hard-bodied, slender, and brownish in color (Figure 1). Wireworm larvae attack corn seeds or seedlings below the soil surface. The larvae can cause crop damage resulting in stand loss or delayed corn emergence. Wireworms are attracted to the CO₂ from germinating seeds and are most active in the root zone. In addition, they are more likely to be near the soil surface as the soil temperature increases in the spring.



Figure 1. Wireworm larva in soil near corn seed.

Seedcorn Maggot Identification & Damage

Larvae are yellowish-white in color and lack a defined head and legs (Figure 2A). Damage occurs when a seedcorn maggot burrows into the seed and feeds on the kernel before it germinates. The seed coat may be left behind after feeding (Figure 2B).



Figure 2A. Yellowish-white seedcorn maggot larva. Photo courtesy of Whitney Cranshaw, Colorado State University. Bugwood.org. <http://www.insectimages.org> (verified 5/27/10).
Figure 2B. Remains of a seed coat following seedcorn maggot feeding.

Wireworm and Seedcorn Maggot Control

Soil insecticides or seed treatments can provide a good level of control for 3 to 4 weeks after planting. Acceleron™ corn seed treatment products complement Genuity® SmartStax™ corn and Genuity® VT Triple PRO™ corn. For insect control, Acceleron™ seed treatment products utilize *clothianidin*, a leading insecticide, to reduce damage caused by secondary pests including seedcorn maggot, white grub, wireworm, corn flea beetle, corn leaf aphid, grape colapsis, and southern corn leaf beetle. No rescue treatment is available for wireworm or seedcorn maggot.

Seedling Disease

In addition to delaying corn germination and emergence, cool soil conditions (<50 to 55°F) predispose corn seedlings to disease

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infection. Seedling susceptibility to infection increases with the length of time a seed sits in the ground and the more stress germinating corn endures.

Survival of corn seedlings depends on a healthy kernel and mesocotyl, which should remain firm and white throughout the V6 growth stage at a minimum. From germination until around V6, the corn seedling is dependent on the kernel endosperm for energy and the seminal root system and mesocotyl for moisture and nutrients. Until the nodal root system is fully developed, the mesocotyl acts as the “pipeline” for movement of nutrients from the kernel and seminal roots to the seedling stalk and leaf tissues.

Disease Symptoms

Corn seedling disease symptoms may look similar to other environmental stresses, insect feeding, or herbicide damage. Seedling disease can occur in the form of seed rots, seedling blights, and/or root rots. If the root system is damaged, slow emergence, stunted or purple plants, and stand loss can occur. Pythium and Fusarium are two fungi that cause seedling diseases of corn. Wet soils are particularly favorable for Pythium infection this spring. Rotten mesocotyl tissue can be caused by Pythium (Figure 3). In general, symptoms will be worse in areas that are wet, compacted, or have heavier soil. Spatially, symptoms may be on scattered plants throughout the field or in small-to-large patches.

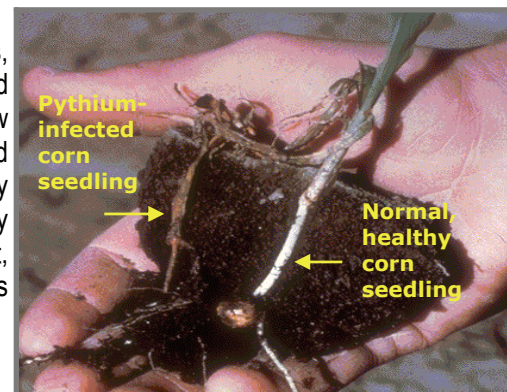


Figure 3. Pythium-affected corn seedling (left) compared to healthy seedling (right).

Disease Protection

Soil applied fungicides or seed treatments can provide a level of protection against seedling diseases, but may not eliminate all threats under severe conditions that promote infection. All seed treatments have a limited period of activity, which is usually 3 to 4 weeks. Acceleron™ corn seed treatment products complement Genuity® SmartStax™ corn and Genuity® VT Triple PRO™ corn, and offer an exclusive fungicide combination of *ipconazole*, *metalaxyl*, and *trifloxystrobin*. These chemicals provide protection against seed- and soil-borne diseases such as Pythium, Fusarium, and several other seed- and soil-borne fungi that contribute to early season stand establishment problems.

Management

If reduced stands are observed due to insects, seedling disease, or a combination of factors, evaluate if replanting is the best option. Base your replanting decision on stand uniformity, remaining population, target replanting date, and the costs and risks associated with replanting.

For more information on early corn insects and seedling disease, please contact your local retailer or seed representative.

Sources: P. Glogoza. 2001. Wireworm management for North Dakota field crops. NDSU Extension. E-188 (revised). May 2001.

A. Robertson. 2006. Corn seedling health and stand establishment. Integrated Crop Management. IC-496(12). May 22, 2006.

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