Early Corn Insects and Seedling Diseases - South

Early season corn insects and 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 seed coat areas where the radical and coleoptile emerge. These proteins and sugars provide food for soil fungi and the tears in the seed coat provide an entryway for insects and soil pathogens.

Early Corn Insects

Early season insects that feed on corn seeds or seedlings can cause plant injury, stunting, delayed emergence, or stand loss. Corn insects that are common in the South are shown in Figures 1-6. Rescue treatments are available for some insects; however, timing is critical making a preventative treatment attractive and essential for some species.

Soil insecticides or seed treatments can provide a good level of control for 3 to 4 weeks after planting. Acceleron® Seed Treatment Products compliment the Genuity® family of corn products. 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, black cutworm, chinch bug, Southern green stink bug, corn leaf aphid, and southern corn leaf beetle. Fields should be scouted on a regular basis while recording what insect pests are found and how many. Treatment action thresholds can vary by state, pest, and stage of crop (Table 1). If a threshold is met, apply the appropriate insecticide promptly and according to label requirements.

Table 1. Treatment Action Thresholds for Early Corn Insects.

<table>
<thead>
<tr>
<th>Early Season Corn Insect</th>
<th>Threshold for Recommended Treatment</th>
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<tbody>
<tr>
<td>Seed Corn Maggot</td>
<td>Preventative Treatment Only</td>
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<tr>
<td>White Grub</td>
<td>Preventative Treatment or Before planting check 1-square-foot of soil for each 5 to 10 acres. An average of one white grub per square foot is enough to cause significant stand loss.¹</td>
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<tr>
<td>Wireworm</td>
<td>Preventative Treatment Only</td>
</tr>
<tr>
<td>Black Cutworm</td>
<td>Preventative Treatment or If 5% or more of plants are &quot;cut&quot;.²</td>
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<tr>
<td>Chinch Bugs</td>
<td>Count both adults and nymphs, on plants 6 inches or taller if 20% or more of the plants have 5 or more chinch bugs per plant.²²³</td>
</tr>
<tr>
<td>Stink Bugs</td>
<td>On plants shorter than 2 feet or V5 if 10% of plants have one or more stink bugs.²²³</td>
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Figure 1. Seedcorn maggot larva, yellowish-white and lack a defined head and legs, burrow into the seed and feed on the kernel before germination. Photo courtesy of Whitney Cranshaw, Colorado State University. Bugwood.org, http://www.insectimages.org

Figure 2. White grub, the larval stage of May and June beetles, feed of plant roots. Small plants may be killed and large plants stunted.

Figure 3. Wireworm larva are hard-bodied, slender and brownish in color and feed on seeds and seedlings.

Figure 4. Black cutworms feed on plants at the base or underground which can lead to clipping.

Figure 5. Chinch bugs are small, 1/5 to 1/6 inch in length, with a black body and white front wings creating a white X. Feeding damage from both adults and nymphs cause reddish leaves and stem.

Figure 6. Stink bugs nymphs are pictured and adults are 1/2-inch long and shield shaped. Stink bugs pierce and suck on plant tissue which can kill, stunt, or cause suckering in corn.
Seedling Diseases

Cool soil conditions (< 50 to 55°F) can delay corn germination, emergence, and predispose corn seedlings to diseases. Seedling susceptibility to infection increases with the length of time a seed sits in the ground and with increasing levels of stress germinating corn endures.

The survival of a corn seedling depends on a healthy kernel and mesocotyl (growing point), which should at a minimum, remain firm and white throughout the V6 growth stage. 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.

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 of the most common fungi associated with seed rot and seedling blight of corn. Rhizoctonia, Penicillium, and Diplodia are fungi that occasionally cause seedling diseases. Symptoms and conditions associated with Pythium, Fusarium, Rhizoctonia, and Penicillium are described below.

1. Wet soils are particularly favorable for Pythium infection. Pythium can rot the seed prior to germination or rot the mesocotyl tissue of the seedling after emergence (Figure 7). Pythium infection of roots often results in the cortex becoming rotted, while initially, the stele remains white.

2. Fusarium infected plants can have tan-to-reddish brown lesions and the root or mesocotyl may shrivel. Root symptoms range from very slight brown discoloration to dark black, completely rotted roots.

3. Rhizoctonia infected plants may have distinct sunken, reddish brown lesions.

4. Penicillium seedling blight often is favored by warmer temperatures. A common above-ground symptom is necrosis of leaf tips which may occur in streaks or as large areas.

Seedling blights caused by other fungi are not as easily distinguished because the symptoms are similar and more than one fungus often are present on the same plant. All of the fungi can cause darkening of the roots and stem as well as a smaller root system. 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.

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® Seed Treatment Products offer an exclusive fungicide combination of ipconazole, metalaxyl, and trifloxystrobin. These active ingredients 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.

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.

Figure 7. Pythium-affected corn seedling (left) compared to healthy seedling (right).

Sources:

For additional agronomic information, please contact your Asgrow®, DEKALB® and Deltapine® Brands Seed Representative.

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

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