

BETWEEN THE ROWS

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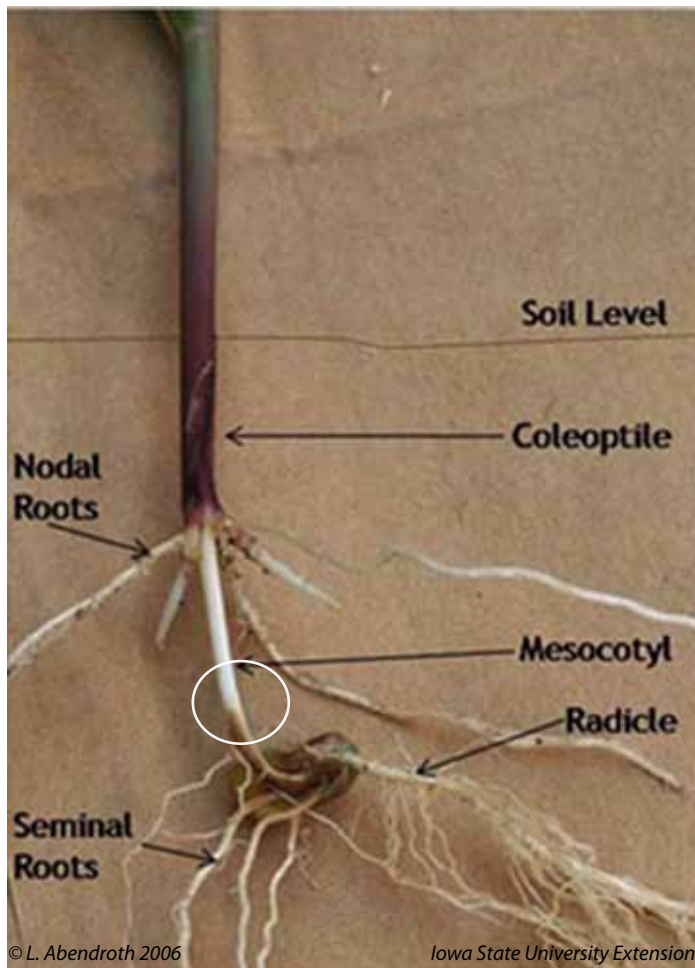
EMERGENCE AND EARLY SEEDLING ESTABLISHMENT ISSUES

ISSUE: 14

Background

Several seedling issues have been reported in various areas and appear to be related to corn stage of growth (planting date) and soil conditions (related to weather).

Early planted corn (early April) had good emergence conditions for establishing excellent stands. However, for corn planted the last 1/3 of April it's a different story. Seven of the last eleven days of April had 4" soil temperatures averaging below 50 degrees. Plus several episodes of cold rain, and in some cases flooding rain, subjected the emerging corn to difficult conditions. Early May continued wet, but warm temperatures aided emergence. Warm and dry conditions followed.



Seedling blight infection evident just above kernel.

Current Conditions

These unique conditions have contributed to some unusual agronomic issues taking place across widespread portions of the Midwest. Following are several conditions that corn growers should be on the lookout for. Early detection and careful observation will help growers to know what to expect, and in some cases lead to management decisions that can increase profitability.

Seedling blights

Seedling blight organisms thrive when wet conditions are present. Fungicide seed treatments protect against infection by a large number of disease organisms for the first 2-3 weeks of growth. After this period, the systemic protection decreases and some disease infection is possible depending on soil temperature and moisture.

When infections start, as the seed treatment protection wears off, some stand loss is possible. Infection typically can be identified as brown or dark discoloration of the mesocotyl. The mesocotyl is the structure between the kernel and the soil surface.

Extended periods of wet soils will enhance disease development and the wetter areas may show the greatest stand reduction. Some plants may survive this infection if the nodal root system develops to supply the growing plant with nutrients and moisture. Many other plants may not survive or may be significantly delayed and become unproductive. Replant consideration may be necessary if stands are significantly reduced and recovery of damaged plants is questionable.

Rootless Corn Syndrome

Soil conditions, weather, and stage of growth have combined to cause unusual root deficiency conditions in some fields. Field symptoms include seedling plants that fall over and are without root development at the crown of the plant. This may show up in small 3 leaf stage corn up to 7-8 leaf stage. These symptoms appear in the later April planting dates and are associated with dry soil, shallow planting, and soil subsidence around the crown.

Rootless Corn Syndrome, cont.

High soil temperatures, compacted soil, and loose or cloddy soil may also contribute to these symptoms. Reports also indicate that in some cases the planting furrow opened up due to drying conditions, exposing the crown, where nodal roots develop. Without soil contact and moisture and in windy conditions, nodal root development may cease and the plant falls over for lack of support. Recovery is possible if soil moisture returns, but continued hot dry conditions will cause more plants to exhibit symptoms and make survival limited.



Corn seedlings exhibiting lack of nodal root development.

Environmental leaf wrap

This plant symptom is generally associated with warm days and cool nights that may coincide with other weather events or soil conditions. Typically, leaf wrap appears in small corn that has been impacted by frost, hail, wind, or herbicide damage. Recovery in small corn is usually more complete as it is not yet in a fast growth stage.

Larger corn may also exhibit these symptoms for some of the same reasons, but may become evident when a wrapped leaf unfurls to show a yellow leaf that has been blocked from sunlight for a period of time. Some hybrids may display leaf wrap more than others, but typically it is associated with environmental conditions at the right stage of growth.



Environmental leaf wrap

Management options

Limited management options are available for any of the field conditions listed above. When seedling blight is present, warm temperatures that provide optimum growth conditions may allow recovery of infected plants. Pythium seedling blight is very aggressive and can rapidly kill small plants. Other seedling blights are less aggressive and survival is possible, but delayed plant development may result.

It is not critical that the specific disease organism be identified. The result of any infection is nearly the same, and our fungicide seed treatment provides the best protection available. Fungicide seed treatments are not bullet proof and provide 2-3 weeks of protection. Replant may be the only option if stand reduction is significant.

Rootless corn recovery is more dependent on soil moisture at the soil surface. Movement of soil around the crown of the plant may aid recovery if the symptoms are identified early. A cultivation is possible for this purpose but if a significant number of fallen plants are present, covering these plants with soil is a more likely outcome. From a practical standpoint, this option is very limited.

All of these agronomic seedling issues are related to weather and timing of planting and plant emergence. Early planting in cold wet soils that may delay emergence can enhance seedling blight infections. Dry soil along with other conditions may combine to impact nodal root development causing rootless corn syndrome. Other weather factors can impact early growth causing environmental leaf wrap. These issues may not be the result of planting management, but rather from weather and the impact it has on soil conditions and corn development. Understanding the cause of these seedling issues can help provide improved decisions in future planting management.