

## Early Season Evaluation of Corn Stands

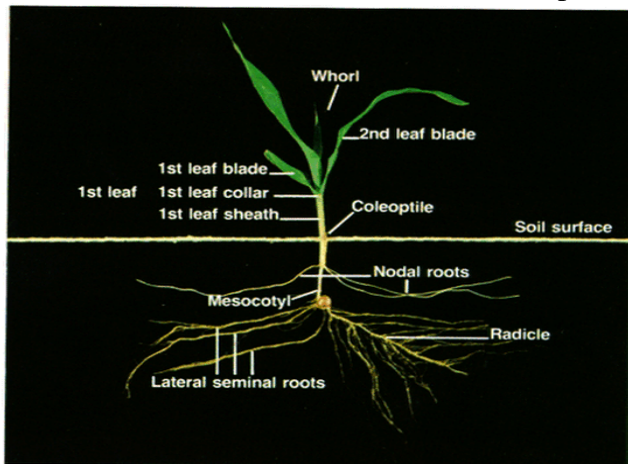
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To this point, the spring of 2010 has provided some excellent conditions for planting. Much of the corn planted in many parts of the trade area was planted in April. With above normal temperatures and frequent rainfall in early May, most April planted corn is emerging well and overall stands are very good for April planted corn. This may not be the case for some of the corn planted May 4 – 8.

Regardless of planting and environmental conditions, you may need to evaluate stands which are less than desirable, and determine what to do with these fields. A few key points to keep in mind about early season corn growth and development when evaluating fields with less than desirable stands:

- Corn absorbs approximately 30% of its weight in water to begin the germination process
- Corn requires ~ 100 - 150 GDD days to emerge, with little physiological activity with soil temperatures below 55°F
- As corn germinates, the radicle emerges first from the seed, followed by the coleoptile and then the seminal root system.
- The coleoptile is often referred to as the spike when it is below the soil surface.
- The coleoptile is designed to penetrate and is instrumental in successful emergence.
- When the coleoptile intercepts sunlight:
  - o The spike unfurls (leaves out).
  - o The first node is formed- which is where the first ring of nodal roots will emerge from.
- When corn is planted 1½” or deeper, the 1<sup>st</sup> node forms at ¾” of an inch below the soil surface
- The mesocotyl (region between the seed and 1<sup>st</sup> node) should be straight and white in color;
  - o If it is not straight, that is a good indication that the plant struggled to emerge.
  - o If it is not white in color, suspect seedling disease or insect feeding damage.



The picture to the left on the previous page shows what a corn seedling “should” look like when germinating under ideal conditions.

The picture to the right on the previous page depicts several corn seedlings which have “struggled” to emerge. Some key points which are evident in these pictures:

- Notice that the mesocotyl / coleoptile tissue is NOT a straight line. This should be your first indication that this plant struggled to emerge.
- With extreme fluctuations in temperature you can see some plants which actually tried to grow back down towards the seed in search of warmer temperatures.
- Crusting can cause plants to grow horizontally searching for a crack in the crust to emerge through.
- Some of these seedlings began to leaf out before the coleoptile emerged through the soil surface. Remember that the coleoptile unrolls when it intercepts sunlight. Corn leafing out underground is an indicator that sunlight came in contact with the coleoptile before it emerged. Cracks in ground which has crusted, cloddy seedbeds and improper closure of the seed furrow are likely causes for sunlight reaching the coleoptile below the soil surface.

Where crusting is an issue, attempts may be made to assist the corn with emergence. A rotary hoe is often the recommendation to assist with corn emergence. Rotary hoeing can be very effective before the crust has actually formed; after the crust has formed the results are often less than desirable. In recent years I have had better results in assisting with emergence using a no-till drill or air seeder after the crust has formed. Raise the planter units up, and with very little down pressure run the drill across the field. This will shatter the crust allowing the corn to emerge.

The new genetics which have been responsible for the increased corn yields we have enjoyed the past few years have tremendous early season vigor. The new hybrids will emerge under a wide variety of adverse environmental conditions often over an extended period of time (28 days or more after planting). The issue then becomes the point at which these late emergers act more like a “weed” than a corn plant. As a “weed” we are implying that these plants will consume more water, nutrients and sunlight than they will contribute grain. Classical data would suggest that corn plants should be considered weeds if:

- A plant that emerges 10 days or more after the adjacent plants emerged.
- A corn plant is 2 leaf stages or more behind in development when compared to neighboring plants.

Unfortunately this much of this information was collected with older genetics planted at populations of 26,000 – 28,000 seeds per acre. With higher populations and improved genetics, one could theorize that if this work was done today, that variability less than what is discussed above could result in corn plants being classified as weeds.

I hope that you find the above information helpful. Contact your local Sunrise Agronomy Consultant with questions

