

Checking the Back Forty



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Correct Planting Depth: One of the keys to great corn!

Time in a newly emerged corn field led me to start digging plants up looking at planting depth. Figure 1 shows a seed at what appears to be a good depth. The coleoptile is the hard spike that gets pushed through to the soil surface and splits allowing the first leaf out. The mesocotyl pushes the coleoptile upwards but at 3/4 of an inch the crown of the plant forms. This is where the first node of roots form and where the growing point

Figure 2

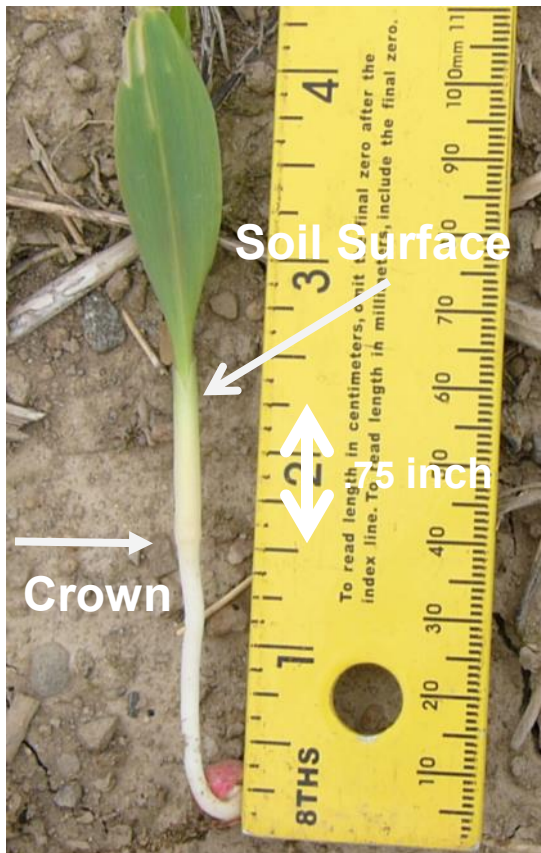
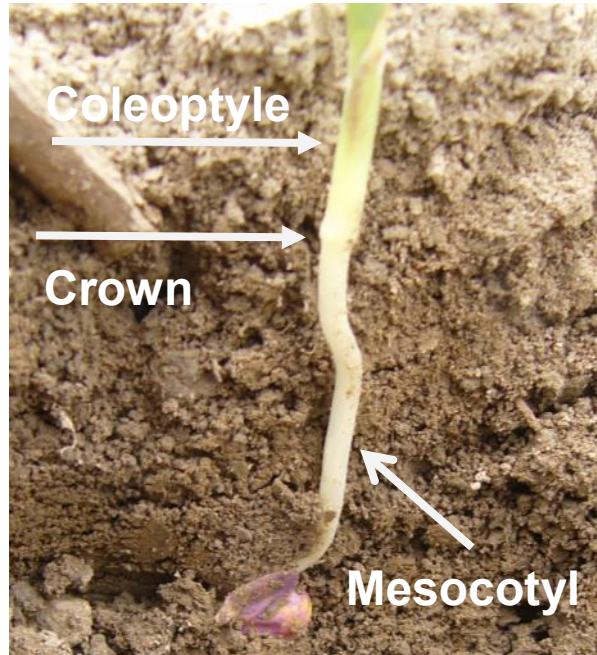


Figure 1



is located until the 5th leaf stage. Figure 2 shows this much better as you can see the swollen area of the crown and that is right at 3/4 of an inch. Red light triggers this crown growth and it is very consistent at 3/4 inch. Problems develop with seeds planted less than 3/4 inch because this first node of roots has no soil to grow into and suffer from dry soil and high temperatures. Can never emphasize enough that erring on the side of planting too deep is much better as plants can emerge from 3 inches or deeper. Better that risk than seed becoming feed for birds and plants flopping in the wind from shallow planting.

Heavy Rains Exclude Oxygen Needed for Seedling Health from Soils

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Editors Note: In 2013 extreme rainfall and saturated soil conditions reduced stands and yields. Already in 2014 we have had some flooding and ponding of water in corn fields depending on local. This article does an excellent job explaining why plant injury and death occurs. It doesn't offer any relief but may serve as a reminder to assess how much damage you have had.

Planting high quality seed does not guarantee obtaining a good stand. Several bad things can happen to good seeds. Seed germination begins with water absorption. Water absorption changes the seed from a nearly dormant organism into a living, functioning seedling. As seed tissues imbibe water, enzymes necessary for growth are activated, stored reserves break down, and cell division and expansion occur. The “bad thing” that may become apparent this spring is low oxygen availability. Heavy rains this spring have resulted in rapid and sustained water runoff.

Flash floods warnings have been numerous this year. These conditions usually mean that water inundates portions of fields, but subsides relatively quickly. Near creeks and rivers, a longer lasting flood may cover fields for days. Even if flooding is not a problem, many of our fields have low areas in which water collects. Sometimes the “ponding” is not visible with water above soil, but the soils are water logged with water content above what we call “field capacity”. Some soils are more prone to water logging than others, for example claypan soils of NE Missouri or soils high in clay content.

All of these conditions have one characteristic in common that affects germinating seeds and developing seedlings – water sits in spaces between soil particles and aggregates that should hold air. Water in soil pores excludes oxygen needed for seedling growth. Initially, water absorption by seeds is not dependent on oxygen. In fact, both dead and live seeds absorb water. But, once water content of seeds exceeds 35-50% continued water absorption depends on energy released by seed respiration. More importantly, all of the life processes the seedling needs to stay alive depend on respiration.

Oxygen demand by the seedling increases rapidly and that oxygen must come from air within soil pores. The heaviest demand for oxygen is centered in the growing point. Rapid cell division and elongation depends on adequate oxygen. Four factors interact to determine if seedling health will be impacted by low oxygen: seed quality, water temperature, water motion, and location of the growing point in the seedling.

Seeds with low vigor are less likely to withstand short exposures to low oxygen availability.

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Companies only sell high quality seed, but saved seed or seed that was not stored or handled properly might possess poor quality. Warm soil and water temperatures increase seedling respiration. So, soil oxygen is depleted more quickly if water is warm. Moving water creates turbulence which mixes air into the water. Although moving water can lodge plants, there will be slightly more oxygen in moving water than in still water. Corn plants exhibit hypogeal emergence, so the growing point stays below ground for at least three weeks. That means that the center of oxygen need is usually located where oxygen is the least available in water logged soils. Soybean plants possess epigeal emergence where the growing point is at the tip of the stem and the stem elongates above ground. This may be an advantage because the growing point may remain above the water surface.

Anaerobic respiration produces small amounts of energy and may keep the seedling alive for several days. Most seedlings can tolerate 3 or 4 days of flooding, but will often succumb to periods longer than 7 days. Plant structures experiencing reduced oxygen availability produce several toxic substances. Ethanol is harmful to organelle membranes and the enzymes necessary for life. Lactic acid reduces the pH within the cell. If pH becomes too acidic, enzymes precipitate out of solution and the cell dies.

There is not much that we can do to help seedlings experiencing reduce oxygen availability. Protecting seeds and seedlings with seed-applied fungicides and insecticides might be beneficial. These chemicals do not improve oxygen availability or reduce the formation of toxic substances, but they protect the seedlings from opportunistic microbes and insects. These organisms may cause greater harm to weakened seedlings and increase plant death.

<http://ipm.missouri.edu/ipcm/2013/5/Heavy-Rains-Exclude-Oxygen-Needed-for-Seedling-Health-from-Soils/>

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Choose mowing hay over corn planting

If you receive this news letter then you have been receiving our first cutting quality updates. As you know there is a lot of good quality hay crop out there right now so it if you have to make a choice between mowing hay or planting corn the choice should be to cut hay and get it right now while the quality is high. The quality losses are too great and you can never get them back. There is still chance to get decent yield and quality in corn silage planting into June, but any possible hay quality in June is gone.

Also make sure you have assessed the maturity of your more grassy fields correctly. By this time in many locations the grass quality has declined enough you might as well move on to other fields that are more legume and legume grass mixes and let the mostly grass fields go for a lower quality hay to harvest later in June. Now it could be that you couldn't and still can't get into these fields because of rain and wet soils and all I can suggest here is don't be tempted at this point to try if conditions change.