The Chem Gro Crop Watch, **Issue #1, 2/10/09**

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As farmers, I view one of our jobs is to take the necessary steps to put our crops in the ground in the best shape possible. By planning for the best, you are also taking steps to protect against the worst (as in a dry weather scenario). In this update I want to go through the basics of corn production to explain why planning for the best can better prepare you for the worst in extended dry weather.

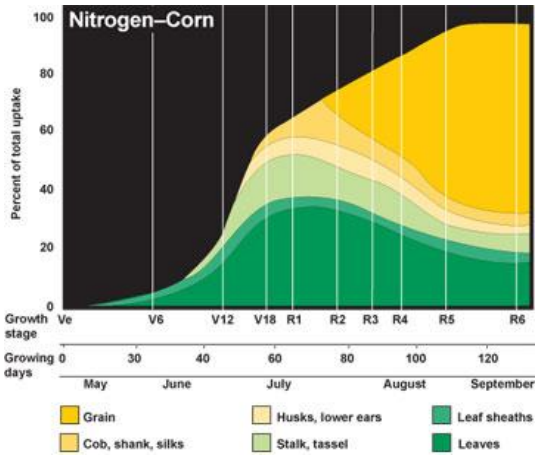
Goal #1, achieve 100% root potential. Roots that are not restricted in growth can help protect the plant with critical water and nutrient uptake during dry weather stress. Here are a few suggestions in getting all that you can from your corn roots.

- *Make your last tillage pass count*. Over-working your soils, working soil too wet, and using tillage that shears the upper soil profile (disks and field cultivators with wide sweeps) can dramatically change the soil structure and soil density. This soil structure and density change can make it very difficult for corn roots to penetrate through, especially if the soil turns dry. There are many vertical tillage finishing machines that do a good job in creating a seed bed. Also, removing the wide sweeps from a field cultivator and replacing them with straight points will also make a nice seed bed. The only downside I see to these systems is that large emerged weeds will not be removed. Adding glyphosate to your pre-emerge chemical program can easily kill these weeds at a small cost compared to the large potential loss in yield from having impaired roots during dry weather stress in critical stages such as ear formation or grain fill.

- *Planting depth and planting conditions.* Both are equally important. Planting corn deeper than 2ò will only delay emergence and can possibly lead to uneven emergence. The only time I recommend planting deeper than 2ò is if the upper soil profile is very dry with no rain in the near forecast. Planting shallower than 1.25ò can cause poor nodal root development when these roots are trying to grow in hot and dry soil. Sidewall compaction created from planting too wet can also create poor nodal root development. These nodal roots are often nicknamed as the ñmoney rootsò since they are directly responsible for pulling in large quantities of water and nutrients into the plant which directly create plant biomass and ultimately yield. ñFloppy Corn Syndromeò or ñRootless Corn Syndromeò are terms used to generically describe rooting problems that are happening below ground.

- *Protect your roots from corn rootworm feeding:* In Western Illinois, corn on corn acres are at high risk from corn rootworm feeding. Soybean rotated ground is also at risk, but too much lesser extent, and is somewhat unpredictable as to determine where and when a rootworm problem will occur. The ñmoney rootsò that I mentioned above are what the corn rootworm larvae feed on. The best control program is to use corn hybrids that utilize specific genes to kill corn rootworm larvae as they feed on the roots, such as VT3 hybrids. The pictures below taken from Lafayette, IN, show the same hybrid with and without the YieldGard Rootworm technology growing under drought stress and heavy rootworm feeding pressure. The results speak for itself.

Goal #2, put the majority of the nitrogen source below ground. Unlike Phosphorus and Potassium, our soils have a poor ability to hold unused nitrogen that our crops didnôt utilize from previous years. This is the reason why we have to supplement extra nitrogen to our soils to feed nitrogen hungry crops such as corn. NH3, liquid UAN, Urea, and Ammonium Nitrate are all common sources of Nitrogen that we utilize. Each has their own plusses or minuses when it comes to application and user safety. To the corn plant, the source of nitrogen is not important; but rather the placement to which it was applied during critical growth stages is key.



- *Emergence through V6.* As you can see from the chart, very little nitrogen is needed during these growth stages. But none the less, it is still critical that corn recieves nitrogen during these stages. A Weed and Feed program is an excellent way to supply this amount of nitrogen. 30-60 units of nitrogen from liquid UAN in combination with a pre-emerge herbicide is a great way to supply these nitrogen needs.
- *V16 though R5 grain fill.* As I mentioned earlier, the ñmoney rootsò are responsible for pulling up the vast majority of water and nutrients into the plant during these growth stages. These roots are only active below ground where there is ample soil moisture to promote root growth and nutrient uptake. This largest quantity of needed nitrogen should be placed deeper in the soil where these roots are active, such as applying NH3. **Broadcasting all of your nitrogen on top of the soil and hoping that a 3-4" deep mechanical incorporation or rain will draw the nitrogen deeper into the soil is a poor choice in trying to feed your corn crop during dry weather.** I have seen 100% broadcast applications of nitrogen, even with incorporation, fail under extreme dry conditions because the majority of the nitrogen still remains in the top 3-4ò of soil where it is too hot and dry for roots to be active. *When comparing costs of nitrogen sources this spring, don't let a few cents per nitrogen unit skew you into purchasing 100% broadcast nitrogen that will not adequately prepare you for dry weather stress.*

Thatçs my 2 cents worth. The choice and decision is always yours. Lonne