

# MEASURE AND MANAGE

## Stalk Rot in Corn or Nitrogen Deficiency?

By Dale Cowan  
[dcowan@agtest.com](mailto:dcowan@agtest.com)  
Agri-Food Laboratories CCA.On

---

The corn crop this fall of 2006 is showing numerous symptoms of apparent Nitrogen deficiency with the lower leaves fired up to the cob and some fields are entirely dried from top to bottom. While some fields have top die down and fired up lower leaves.

No doubt there may be some fields that are nitrogen deficient. However some of our benchmark Nitrate sites are showing ample nitrogen supply at dry down, typically fields with appropriate N management exhibit nitrate soil test in the 3 to 5 ppm range 20- 30 lbs per acre. While other fields that are fired up to the cob have nitrate levels in excess of 15 ppm or 100 lbs actual N. So it appears that Nitrogen is not the factor causing the apparent N deficiency in all cases.

Stalk rot organisms may be a factor in early dieback of some fields. Some of the causal organisms are the same ones causing ear mold such as Gibberella, Fusarium and Dipoldia while top die back is likely Anthracnose.

Most stalk rots are linked to conditions that cause stress during grain fill. Any conditions that limit photosynthetic activity encourage development. Factors that reduce sugar production such as leaf diseases, drought, soil saturation, insect damage, hail, cool cloudy weather increase stress loads on plants. Nutrient imbalances such as high nitrate and low potassium may limit sugar production and translocation. The cob becomes the dominant sink. As a result the nutrient imbalances and weather stresses acerbates the sugar flow and cause the plant to move sugars from the lower stalk to the cob. This results in insufficient sugar flow to roots and causes root dieback.

Root dieback allows entry of stalk rot organisms effectively causing premature senescence. High soil nitrates and the fact that we are seeing lower potassium soil tests may explain some of the contributing conditions to plant deterioration, an ideal ratio of 2:1:2 N:P:K seems to maintain healthy plants. Sufficient potassium in corn leaves increases the rate of sugar production. While high nitrogen with insufficient potassium may increase wilting and premature stalk death. We saw some fields with nitrates this spring in excess of 400 lbs of nitrate N per acre if this occurred in fields with lower potassium it may be a factor in premature plant death this season.

Most corn varieties demonstrate good resistance to stalk rot diseases up to silking and pollination time. It is the change in this resistance as roots die back that leads to problems. Varietal characteristics that resist stalk rot include resistance to leaf diseases to protect against loss of sugar production, drought tolerance, high photosynthetic capacity at low light levels and insect resistance.

Stalk rot resistance is also influenced by yield potential. Varieties that set large kernel numbers also need to have high sugar production. A variety that possesses all of the desirable traits can still be overcome if conditions that cause stresses are too great. Rather than talk about resistance it may be more correct to talk about hybrid vulnerability to succumb to stresses that cause stalk rot. The field by weather by management environment cannot be overstressed.

One of the tell tale signs of stalk rot apart from premature plant death is lodging. Providing corn plants with a low stress environment is one way to lessen the impact of stalk rot and lodging. In order to do that, field scouting and observation is necessary to determine what some of the stresses might be. Lodging can be from a number of factors.

Determination of the cause of lodging is important. Some lodging maybe from corn borer especially in non Bt hybrids, stalk breakage from brittleness, or root lodging from corn rootworm. Some of the new stacked traits are valuable in lessening these symptoms.

Cutting open stalks and looking for discolored first nodes is one of the telltale signs of decreased sugar flow and invasion of stalk rot organisms. Shredded appearance and pink discolorations may confirm the presence of gibberella. Look for spatial patterns of lodging in the neighborhood as well as within the field and between fields.

If at least 30% of the fields in nearby farms are suffering from stalk rot it is likely attributable to weather. Favorable preflower conditions followed by unfavorable post silking environment. Commonly that is characterized by good early season moisture and poor light conditions later in the season. If your field is worse than 70% of the fields in the area then you need to focus on more factors. All possible differences between good and poor stalks need consideration. Hybrid ear development, maturity rating, planting dates, fertilizer applications, leaf destruction, soil type, plant population, rainfall and rainfall patterns could possibly cause one field to react differently than another.

If one area of a field is worse than another look for light rocky soil, as these areas usually suffer more during a drought, may be low in organic matter with different moisture holding capacities, low or high pH, low, high or unbalanced fertility. Localized insect damage or leaf diseases, plugged tile, soil compaction.

While these stalk rot organisms are endemic in our fields we can lessen the incidence by paying attention to crop rotation, residue management, variety selection and nutrient management. Soil testing in the spring for Nitrate and in the fall for other soil fertility factors is a prudent and necessary management practice.

Agri-Food Laboratories Soil and Plant Tissue testing services can help you by providing high quality analysis combined with years of seasoned agronomy knowledge in crop production.

Agri-Food Laboratories a wholly owned subsidiary of AgriTrace International a group of Agri-Knowledge Companies and Associates.