# AGRONOMIC ALERT

Technology Development & Agronomy by MONSANTO

## Rootless Corn Syndrome

Rootless corn syndrome, occasionally referred to as "floppy corn syndrome," has been appearing in corn fields. What is causing this phenomenon, and what are the management implications? Now is the time for growers to evaluate their fields for root development issues.

### Symptoms of Rootless Corn Syndrome

Plants exhibiting rootless corn symptoms have either lodged and are laying on the ground, or are about to lodge. Before symptoms appear, corn plants may appear vigorous and healthy, but after strong winds or thunderstorms, plants can fall over due to limited root support. Affected plants lack all or most nodal roots; existing nodal roots may appear stubby, blunt, and not anchored to the soil (Figure 1).

### Causes of Rootless Corn Syndrome

Rootless corn syndrome occurs in young corn plants when there is limited or lack of nodal root development. One of the primary causes is furrow or sidewall compaction. It is also caused by hot and dry soil conditions during early root development (V2 to V4), and by shallow planting depths, compacted soils, and loose or cloddy soil conditions. Additionally, it is seen when the seed furrow opens up after planting, generally in dry conditions.

Under normal soil conditions, nodal roots begin developing at the growing point (crown) located where the top of the mesocotyl and base of the coleoptile meet. If corn seed is planted 1½ to 2 inches deep, then the nodal (or crown) roots begin developing at about ¾ inches below the soil surface. However, in rootless corn scenarios, the nodal roots may have stopped developing because upper soil conditions were too dry. Young roots that emerge from the crown area of the plant will die if their root tips dry out prior to successful root establishment in moist soil.

### Effect on Corn Plants

The nodal roots are important in providing the majority of water and nutrients that the corn plant needs for normal growth and development. Therefore, due to a lack of root mass, rootless plants may wilt or eventually die in extreme conditions. Plants are forced to rely on the seed root system or limited nodal root growth until more favorable temperatures and moisture conditions allow nodal root growth to resume. After lodging, adequate rainfall can promote crown root development and many plants may recover. Recovery is severely hampered if conditions are dry.

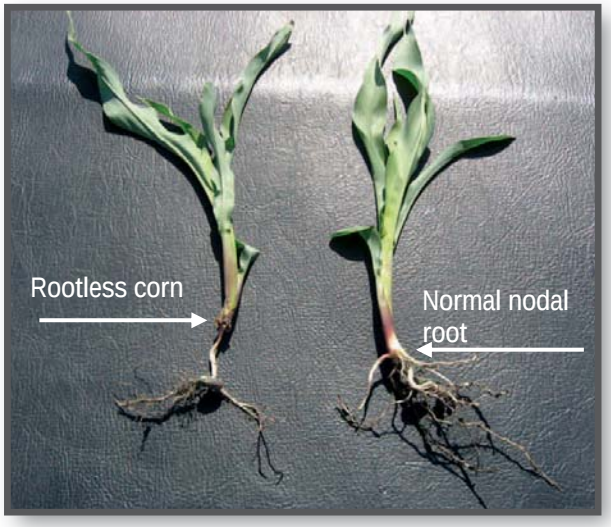


**Figure 1.** Rootless corn (left) compared to corn with more normal nodal root development.

### Cultivation May Provide Alleviation

Row cultivation may help plants with rootless corn syndrome by putting soil around the base of the plant to help with support. Cultivation may also aid in new root development when or if it does rain. In hard ground, it can also help with soil aeration.

*Source:*

*R. Nielsen. 2010. "Rootless" or "floppy" corn syndrome. Corny News Network, Purdue University. http://www.agry.purdue.edu (verified 5/22/12)*

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.
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