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Twisted Whorls


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Twisted Whorls

Abstract

Corn is seemingly racing toward tassel and silking thanks to a spell of relatively good weather. Field appearances improve daily. As we scan the tops of canopies a few plants stand out, not because of height but because of color; yellow, bright yellow leaves seem to wave to us in the breeze. These trapped, sun-starved leaves emerge as splotches of bright yellow in a dark green sea of plants.

Keywords

Agronomy, Plant Pathology

Disciplines

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Twisted Whorls

By Roger Elmore, Department of Agronomy and Alison Robertson, Department of Plant Pathology

Corn is seemingly racing toward tassel and silking thanks to a spell of relatively good weather. Field appearances improve daily. As we scan the tops of canopies a few plants stand out, not because of height but because of color; yellow, bright yellow leaves seem to wave to us in the breeze. These trapped, sun-starved leaves emerge as splotches of bright yellow in a dark green sea of plants.

Interesting symptoms, descriptive terms, and strange timing

These symptoms are of what some describe as buggy whipping, rapid growth syndrome, accelerated growth syndrome, roping, wrapped whorls, onion leafing, and twisted whorls. Take your pick! We'll use the last term in this report.

Whatever term you chose, it describes a situation where the uppermost plant leaves are tightly rolled and do not unfurl normally. When entrapped leaves break free, they are bright yellow. After some exposure to the sun, they will turn green.

The difference this year from previous occurrences is in timing. Corn plants expressing these symptoms this year range from V10 to V12 (tenth to twelfth leaf stage). In contrast, [previous reports](#) of twisted whorls have been on much younger corn plants (V5-V6 leaf stage). An interesting point here is that the [leaf crinkling](#) (often associated with leaves that are or were previously twisted or trapped) begins on about the tenth leaf, relatively high in the plant canopy. This suggests that the plants were 'normal' until sometime shortly before the tenth leaf stage.

In some west-central Iowa fields the incidence of plants with twisted whorls is as high as 16 percent, with affected plants scattered uniformly over a field according to Mark Licht, Extension Field Agronomist ([July 9, 2008, CropWatch Blog](#)). Unfortunately, these symptoms are not confined to a single field or management system. Plants in scattered central Iowa fields are expressing the symptoms as well. Several hybrids, with different herbicides, and other management practices are affected. Mark estimates 30 percent of fields in some areas of west-central Iowa have these symptoms.



Plants exhibiting twisted whorls, 9 July 2008, Story Co. IA, Roger Elmore.

Possible causes

Since symptoms are wide-spread in central west-central Iowa, an environmental stress is the likely cause. All season long corn has grown under far less than ideal conditions in Iowa. An additional stress factor may result in otherwise normal plants expressing themselves as ones with twisted whorls. Stress factors could simply be a wide range of temperatures sometime prior to V10, hail, strong winds, or an over-the top application of a herbicide, insecticide, or fungicide, etc. Earlier-season (V5-V6) symptoms are often, but not always, associated with herbicides. For example, growth regulators, like dicamba or 2,4-D, can cause twisted whorls especially when applied after emergence ([See information from Bob Nielsen](#)). Herbicides may play a role in some of the situations we are seeing now.

The symptoms may also be caused by the recent change in weather which has encouraged rapid growth, in sharp contrast to weather experienced earlier this year. We also know that some exotic germplasm incorporated into adapted hybrids can exhibit twisted whorls this late in the growing season. Exotic germplasm is genetic material originating from outside of the Corn Belt.

Twisted whorls are not a symptom of a biotic disease. However, injuries caused as a result of twisted whorls can increase smut infections (see Photo). The yellow leaves resulting from twisted whorls are also not the same as those related to genetic stripe (see Photo).



Leaf smut symptoms on a corn plant affected by twisted whorl, 9 July 2008. Alison Robertson



Genetic stripe. White or yellowish stripes usually run the entire leaf length. 30 June 2008. Story Co. IA. Roger Elmore.

Yield impacts?

If these, late-season twisted whorls follow the same pattern as their early-season counter parts, we would expect these plants to unfurl within a week or two. If the malformation causes a delay in either growth or development, it could result in yield reductions.

Roger Elmore is a professor of agronomy with research and extension responsibilities in corn production. Alison Robertson is an assistant professor of plant pathology with research and extension responsibilities in field crop diseases.

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