

## Rapid Growth Syndrome

Rapid growth syndrome may be known by many aliases, including buggy whipping, accelerated growth syndrome, roping, wrapped whorls, onion leafing, twisted corn syndrome, and twisted whorls. For this document, we will refer to this phenomenon as rapid growth syndrome (RGS).

### Symptomology.

Rapid growth syndrome describes a situation where, in random plants across a cornfield, the uppermost plant leaves are tightly rolled and do not unfurl normally. The last leaf may fail to unfurl, and it may further wrap or twist. Lower leaves are generally not affected, but the whorl at the top of the plant is tightly wrapped and it may bend over at a right angle to the ground.

Within a week, twisted leaves usually unfurl and affected plants resume normal growth. Younger leaves that were trapped inside the whorl may emerge as pale green or yellow because they were shaded for an extended period of time and could not photosynthesize. Within a few weeks, the only evidence that remains of RGS is the crinkled appearance of the most tightly wrapped leaves. Rapid growth syndrome most often appears between the late V5 and early V6 growth stages. The appearance of RGS in any given year is not uncommon.

### Possible Causes.

The physiology of rapid growth syndrome is not well understood, but it may have something to do with the elasticity (or lack of) in the cells. Rapid growth syndrome has been observed in previous years when cool, cloudy weather contributes to initially slow corn growth, then is followed by a sharp transition to warm, sunny, humid weather favorable for rapid corn growth. When corn plants are exposed to this rapid change in improved growing conditions, they may grow too fast, resulting in RGS.

### Symptomology Resembling RGS.

**Herbicide Injury.** Rapid growth syndrome may be confused with herbicide injury; however, occurrence of RGS is not related to herbicide application. Herbicide injury usually occurs more widespread across the field or in a spray pattern. Herbicide injury resulting in twisted whorls may occur in young plants when cell growth inhibitor or growth regulator herbicides such as dicamba or 2,4-D are applied pre-plant or pre-emergence, and emerging seedlings take up the herbicide through the coleoptile.

In older plants, late application of growth regulators can also cause twisted whorls to develop when a significant amount of herbicide is taken up by the leaves and whorl. This usually occurs in areas of spray overlap, which may receive an extra shot or two of herbicide.

**Hail Damage.** Injury from hail can also cause corn whorls to twist and become damaged. Additionally, wind damage might exaggerate or mimic hail injury. Although from the road, bent plants may look like they are suffering from severe weather damage, closer inspection will reveal signs of RGS. Severe weather may cause additional stress to plants by adding minor crop injury.

**Biotic Disease or Genetic Stripe.** Other types of symptoms that can mimic RGS are biotic disease and genetic stripe. However, injuries caused as a result of twisted whorls may increase the likelihood of smut infections. The yellow leaves resulting from RGS are not related to plant genetics. After some exposure to the sun, pale green or yellowed leaves will turn a normal, dark green color.



Twisted whorls (A, B), yellow tops seen shortly after corn unwraps (C), and crinkled leaves (D).

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### **Yield Impacts.**

Periods of twisted growth that are caused by weather usually do not affect yield potential. Plants affected by RGS may cause initial concern, but should grow out of most symptoms. By the time corn height reaches chest high, the only evidence of RGS may be a crinkled appearance on the most-affected leaves. For more information on rapid growth syndrome, or any other question concerning your crop, contact your local Monsanto agronomist.

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*Sources:*

*Coulter, J. 2011. Personal Communication. University of Minnesota Extension.*

*Potter, B. 2011. Southwest Minnesota IPM Stuff. University of Minnesota Extension. June 14, 2011.*

*Nielsen, R.L. 2011. Wrapped and Twisted Whorls in Corn. Purdue Univ. Extension. <http://www.agry.purdue.edu>.*

*Elmore, R. and A. Robertson. 2009. Twisted Whorls. Iowa State Univ. Extension. <http://www.extension.iastate.edu>.*

*Kleinschmidt, A. 2009. Corn Problems: Ragged Leaves and Twisted Whorls. <http://agvanwert.wordpress.com>.*