



Rapid Growth Syndrome in Corn

- Rapid growth syndrome (RGS) occurs when corn plants across the field exhibit tightly rolled upper plant leaves that do not unfurl normally.
- Within a week, twisted leaves usually unfurl and affected plants resume normal growth.
- RGS has been observed in years when cool, cloudy weather was followed by a sharp transition to warm, sunny weather, exposing corn plants to a rapid change in improved growing conditions.

Rapid growth syndrome (RGS) is also known as buggy whipping, accelerated growth syndrome, roping, wrapped whorls, onion leafing, twisted corn syndrome, and twisted whorls. Affected corn plants exhibit tightly rolled upper leaves that do not unfurl normally. The whorl at the top of the plant may be so tightly wrapped that it bends over at a right angle to the ground. Lower leaves are generally not affected. 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 and unable to photosynthesize for an extended period. Within a few weeks, the only evidence that remains of RGS is the crinkled appearance from the tightly-wrapped leaves. It is most common between the late V5 and early V6 growth stages. The appearance of RGS in any given year is not uncommon but does not typically affect a large number of fields or a large percentage of plants in a field.

Possible Causes

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



Figure 1. Tightly wrapped, twisted whorls (A, B), yellow tops seen shortly after corn unwraps (C) and resulting crinkled leaves (D).

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Other Causes for Similar Symptoms

Herbicide Injury

Rapid growth syndrome may be mistaken for herbicide injury; however, the occurrence is not related to herbicide application. Usually, herbicide injury has a pattern that is repeatable across the field, RGS is random across the field without a set repeatable 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 preemergence, 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 substantial amount of herbicide is taken up by the leaves and whorl. This usually occurs in areas of spray overlap, where plants are exposed to more of the herbicide.

Weather Damage

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

Genetic Stripe

The yellow leaves resulting from RGS are not the same as those related to genetic stripe, a genetic condition causing white or yellowish stripes. After some exposure to the sun, pale green or yellowed leaves from RGS should turn a normal, dark green color.

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 reaches chest height, the only evidence of RGS should be a crinkled appearance on the most-affected leaves.

Sources:

Elmore, R. and Robertson, A. 2008. Twisted whorls. Iowa State University Extension.
<http://www.extension.iastate.edu/>.

Nielsen, R. L. 2011. Wrapped and twisted whorls in corn. Purdue University Extension.
<http://www.agry.purdue.edu/>.

Potter, B. 2011. Southwest Minnesota IPM Stuff 2011-4. University of Minnesota Extension.
<http://swroc.cfans.umn.edu/>.

Legal Statements

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Performance may vary, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields.

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