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Wrapped & Twisted Whorls in Corn

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The curious phenomenon often referred to as the "twisted whorl syndrome" has been reported again this year. The occurrence of the twisted whorl syndrome is not uncommon, but rarely affects a large number of fields in any given year or, usually, a large percentage of plants within a field. This past weekend, though, I walked two fields in west central Indiana that averaged 30 to 42% of the plants with wrapped and twisted whorls. Needless to say, the growers were a bit concerned about the future of their crops.

The growth stage of both of the affected fields was late V5 to early V6 (five to six visible leaf collars, somewhat less than knee-high), suggesting a planting date of late April to early May. The lowermost six leaves were normal appearance, although the sixth leaf showed some crinkled (accordion-like) tissue near the base of the leaf blade. Beginning with the seventh leaf, the whorl was tightly wrapped and often bent over at right angles to the ground.

The frequency of twisted whorls in the first field ranged from 30 to 54%, while the same hybrid in the second field (different grower, 18 miles distant) exhibited 20 to 44% affected plants. Another hybrid also planted in the second field exhibited far fewer affected plants (1 to 7%). Such differences among hybrids have commonly been reported in past incidences of the phenomenon.

I'll freely admit that we do not fully understand why this symptom develops. For some reason, the upper whorl of affected plants does not unfurl properly, as if the rolled leaf tissue has lost its elasticity. Younger leaves developing deeper in the whorl are unable to emerge from the tightly wrapped upper leaves. The subsequently tightly twisted whorl then bends and kinks from the pressure exerted from the younger leaves' continued growth.

One's natural instincts would blame the twisted growth on herbicide injury. Indeed, where cell growth inhibitor or growth regulator herbicides are applied pre-plant or pre-emergence, shoot uptake of the herbicide by the emerging seedlings can indeed cause twisted growth of the young plants. Late application of growth regulators can also cause twisted whorls in older plants when leaves and whorl intercept a substantial amount of the herbicide. Widespread occurrence of the twisted whorl syndrome is not, however, usually accompanied by the common thread of any particular herbicide application.

Some have questioned whether wind damage can give rise to this phenomenon by somehow damaging the young inner whorl leaves. I've not often tracked the occurrence of strong winds with the development of the twisted whorl symptom, but it's no secret that there were a number of strong storm and wind events throughout the state over the past couple of weeks.

In other situations over the years, this phenomenon has often been associated with a sharp transition from periods of slow corn development (typically, cool cloudy weather) to periods of rapid corn development (typically, warm sunny weather plus ample moisture). Some have argued that it is the reverse, transitioning from rapid periods of development to slow. Or…….maybe it is a transition from rapid development to slow and back to rapid that triggers the symptoms.

Whatever the cause, the appearance of the twisted whorl plants is indeed unsettling and one would think that the whorls could never unfurl properly. Given another week, though, twisted whorls of most of the plants will unfurl and affected plants subsequently develop normally. Indeed, some plants in the fields I walked last weekend were already beginning to unwrap.

If you didn't notice the twisted whorls to begin with, you may notice the appearance of "yellow tops" across the field after the whorls unfurl. The younger leaves that had been trapped inside the twisted upper leaves emerge fairly yellow due to the fact that they had been shaded for quite some time. In addition to being fairly yellow, the leaves will exhibit a crinkly surface caused by their restricted expansion inside the twisted whorl. Another day or two will green these up and the problem will no longer be visible.

The Good News: Yield effects from periods of twisted growth caused by weather-related causes are minimal, if any. By the time the affected plants reach waist to chest-high, the only evidence that remains of the previous twisted whorls is the crinkled appearance of the most-affected leaves.
