Leaf Loss In Stressed Corn

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As the dry weather continues and the Illinois corn crop rating continues to slip, we've received reports of loss of lower leaves with what seem to be different symptoms than we usually see under dry conditions. I've written before about the effects of canopy loss, and we expect loss of leaves like this to decrease the ability to fill kernels.

The symptoms in some cases seem to be related to N deficiency, with the V-shaped yellowing starting at the tip of lower leaves, then expanding down the leaf, eventually resulting in death of the entire leaf. In other cases, though, the outside edges of the leaf seem to be affected first, which is often a symptom of K deficiency, and affected leaf tissue often dies rapidly. The photo of a corn crop canopy shows leaves with both types of patterns.

The fact that the leaf area died quickly and that symptoms do not consistently follow the normal patterns of N loss and firing of lower leaves under dry conditions lead some to think that these might be symptoms of Goss's wilt. Goss's wilt, which is caused by a bacterium, has been found in central Illinois this year, and dead patches of leaf area are a primary symptom. But few have seen the shiny, dried bacterial ooze that usually accompanies this disease, and the symptoms are primarily appearing on lower leaves first. A sample of dead leaf tissue from a field in Piatt County this past week was positive for presence of the Goss's wilt bacterium, but it did not show other signs usually apparent when that disease is the primary cause.

So what might this problem be? In the study from which the photo was taken, higher N rates show nearly as much of this as lower N rates, though the plots with higher N rates have more intact leaf area left to help fill grain. The death of leaf edges could be a symptom of K deficiency, though it's somewhat late in the season to be seeing that, and if there was the typical yellowing it didn't last long.

Deficiency of both N and K, though, would be brought on or made worse by lack of soil water, and it's likely that the basic cause of this loss of leaf area is that inadequate soil water (along with nutrients) finds its way to the roots for uptake. Corn following soybeans shows much less of this in most cases, and it also shows less leaf curling or wilting due to inadequate water as the hot, dry weather continues.

While we would like to establish a cause for such leaf loss, the fact remains that some amount of lower leaf tissue is dead in these fields, and the canopy that is left will be less able to intercept light and produce sugars to fill grain. In the plot where I took the photo, kernel numbers are modest – around 350 per ear – and 32,000 such ears would produce around 125 bushels if they fill to a low-average weight.

Deteriorated canopy of corn following corn at Urbana.

Most of the corn planted before May 15 is now in the dough stage, and kernel losses to abortion should be coming to an end. If we do get rain in the next week, it's likely that what kernels there are now can be filled to near-normal size unless the canopy deteriorates further. Based on kernel counts and canopy conditions, however, yields of many fields in dry areas will be less than we had hoped for. Δ

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