

What went wrong with corn after corn

ILLINOIS corn yielded less than expected in most areas in 2010, and corn following corn was hit particularly hard. Because current crop acreages are skewed toward corn, at least 20% of corn followed corn in Illinois this year.

According to University of Illinois Extension agronomist Emerson Nafziger, this follows a period of several years during which corn following corn has often

Key Points

- Corn yields weren't so hot this year, and corn on corn really struggled.
- Agronomist says an abundance of residue caused problems.
- Too much water early also hurt yields in fields of corn after corn.

yielded about the same as corn following soybeans.

"It has been common, particularly in the corn rootworm variant areas of Illinois, to have yields of corn following corn to be as high as those of corn following soybeans, especially since the advent of rootworm resistance traits," Nafziger says. "For many producers, lower yields of corn following corn came as a shock."

From the start, corn after corn was a challenge this season. "Compared to corn following soybean, emergence was uneven, crop color was poor, and the crop struggled to take up enough nitrogen to grow well, regardless of nitrogen rates and management," Nafziger remembers. "With May and June being so wet, many who waited to apply nitrogen until after planting struggled to get it applied on time. Nitrogen availability was an issue in these fields, but also in fields where N was applied on time."

A number of factors contributed to disappointing yields of corn following corn. According to Nafziger, soils were too wet for tillage to be done well, regardless of whether it was done last fall or this spring, and more than the usual amount of residue remained on the surface. "Soils were wet and fairly cold coming into April," he adds. "The surface residue and cool, wet soil conditions combined to get the crop off to a tough start."

The nice stretch of April weather to get the crop planted helped, but soil conditions were not great, especially in fields where preplant nitrogen was applied and/or more tillage was done.

Too much rain early

Soil temperatures didn't increase until late May. The corn crop was up by then, but in many fields it was already uneven and looked sickly.

"We think that corn following corn, especially in cool, wet soils, tends to be affected by where its roots are in relation to last year's residue, including root remnants," Nafziger says. "Much of the residue was not buried well, and it's likely that many new-crop roots were close to old-crop residue. Residue after the fall and winter was unusually well-preserved into the spring of 2010, and this could have contributed to the problem."

Also, tilled corn-on-corn fields were more likely to take in rain that fell in May and June, causing soils to remain cool and slowing drying rates.

"Because of this, I believe roots were damaged early and may never have recovered fully," Nafziger notes. "This probably reduced the ability of root systems to take up water and nutrients, especially nitrogen."

As soils warmed up, the breakdown of old-crop residue likely tied up nitrogen quickly. The crop was growing fast at that point and needed a lot of nitrogen, which would have been slow to release from the residue.

When excessive water damaged these root systems, plants couldn't take up enough water and nutrients, and this led to stress and kernel abortion. Add to this the hot, dry weather in mid-August, and most folks ended up with lower-than-expected kernel numbers and reduced filling rates during much of the grain-filling period.

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