Corn Following Corn – Strike 2?

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In 2010, following a very wet start to the season and damage to root systems from which plants never fully recovered, corn following corn yielded much less than corn following soybean in many areas of Illinois. This came after a number of years in which corn following corn produced good yields, in many cases equal to those of corn following soybean.

While the spring planting season and crop conditions were quite different this year than in 2010, we are again hearing that corn following corn is producing lower yields than corn following soybean in many areas of Illinois. This is not likely the case everywhere, but it seems most noticeable in areas where it's been very dry since July. I've heard of cases where corn following soybean is yielding about 230 bushels per acre, while corn following corn in the same area, planted with similar practices, is yielding in the range of 160 to 170. We don't expect corn following corn to average 60 or 70 bushels less than corn following soybean over whole areas, but this does illustrate what will again be a significant issue in some fields this year.

Last year it was easy to make the case that, with the wet fall and lack of fall tillage in 2009, large amounts of surface residue and cool, wet conditions at planting, followed by heavy rain and root injury, all added up to yield losses for corn following corn. In 2011, we don't have as clear a picture for why we are seeing this problem. For one thing, the fall of 2010 was very dry and harvest was early; this, together with the pent-up desire to do tillage to relieve effects of wet conditions for the previous two years, led to a huge amount of fall tillage last year. Surface residue was well buried in most fields following corn in 2010, and we can't blame residue for this problem in 2011.

So what did happen in 2011 that resulted in a second year of substantial yield loss in corn following corn? It's never possible to paint a complete picture, but I'll offer the following:

1. The spring of 2011 started out well, with some corn planted in early April. Almost all of this was corn following soybean, given that such fields tend to dry out faster and need less work in the spring. It turned wet and cool after that, and planting stalled at about 10 percent complete through the rest of April. So planting was, on average, late in 2011.

2. Once the calendar turned to May and it dried up enough for fieldwork, planting got underway in a big rush, with about 60 percent of the crop planted over the first two weeks of May. Many – probably most – fields planted during this period were wetter than would have been ideal. And because fields that were corn the year before almost always dry out more slowly than those that were in soybean, those who started planting corn following corn in early May planted into even wetter and cooler soils than those planting after soybean. This not only caused more compaction, "undoing" much of the benefit of tillage last fall, but it also brought issues of residue interference, seed placement, and effects of heavy equipment in many corn-on-corn fields.

3. As a result of these problems, many reported that corn following corn looked bad from the start, with uneven stands, poor color, and other problems we associate with planting into such cool, wet conditions. Some who attempted to apply extra nitrogen, foliar nitrogen, micronutrients, or other things to try to bring the crop around generally found that their efforts didn't do a lot of good. Starter fertilizer helped make some stands look more uniform, but it did not completely solve the problem.

The heavy rainfall in May and June in some areas was a repeat of what we saw in 2010. But with the crop not nearly as far along in 2011 and with June temperatures not as high as in 2010, immediate effects of this heavy rain on the corn crop were not as severe in 2011 as in 2010. This did, though, delay even more the return of the crop to normal color and growth in corn following corn.

4. When the rains stopped in many areas in late June and soils dried in July and August, the effects were much more severe in most corn-on-corn fields than in fields where corn followed soybean. Due to drier soils, root systems generally developed better and remained healthier in 2011 than in 2010. But with the effects of compaction, slower growth due to less (and a less green) canopy, residue, possible tillage effects, and other factors in corn following corn, it seems that the ability of the roots to extract water was compromised compared with corn following soybean. Both crops seemed to pollinate okay, but corn following corn showed more leaf stress in July and August, and reduced light interception was evident in many fields where corn followed corn. This increased kernel abortion and decreased the ability of the crop to fill the kernels it had.

5. In the driest areas, corn following corn lost canopy color and died prematurely, often before corn following soybean. This stopped the filling of kernels, and in many cases led to more stalk quality problems.

6. It is discouraging that, after corn-on-corn has done so well in recent years, we now have a second year of lower yields in many corn-on-corn fields. Many will find that their profitability will be higher with corn following soybean than corn following corn this year, even accounting for what have often been lower returns from soybeans than from corn in recent years.

Of course, we can't simply decide to plant more corn acres following soybean in 2012 than we did in 2011; we planted only about 9 million acres of soybeans in Illinois both years, and acres of corn following soybean the next year can't exceed that number. So as long as corn acreage stays near the 12 million acres of recent years, some 20 percent to 25 percent of Illinois corn will have to be corn following corn.

A special request. Given the severity of this yield problem and the fact that it has now happened for a second year, I think we should work to get a better handle on it and try to come up with possible research to address it. I ask that anyone who is seeing the problem this year send me an email with the following information:

a brief description of the yield differences you're seeing

where the differences are the worst

whether any corn-on-corn fields seem to have escaped this problem to yield nearly as well as corn following soybean, and, if so, what was different in those fields that might explain this result

Thank you for your assistance. Δ

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