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Is the 2018 Soybean Crop as Good as It Looks?

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If the appearance of the soybean crop going into late July predicts how it will yield, the 2018 crop in Illinois is going to be a high-yielding one. The crop in Illinois was rated at 78% good + excellent (G+E) as of July 22. Conditions across the US soybean growing regions are somewhat variable, but the 2018 crop is in good condition overall.

As I did with corn in the Bulletin on July 6, I examined Illinois soybean crop ratings in the second half of July over the past decade to see how well they predict yield. The drought year 2012 was in a category by itself, with a G+E rating of less than 10% by late July. Ratings were only about 50% G+E in 2015, but in six of the past ten years—2008-2011, 2013, and 2017—ratings were around 60% G+E in late July. In 2014, 2016, and now in 2018, ratings were high, at 75 to 80% G+E.

With a few exceptions, soybean crop ratings have tended either not to change much after mid-July or to drift up slowly. Exceptions included 2008, when crop conditions rose by about 20 points from late July to mid-August, and 2011, when ratings dropped about 20 points during the same period. In 2017, ratings drifted down after June, from 70% G+E in early July to less than 60% by late August.

Illinois soybean yields were 50 bushels per acre or less in years with late July crop ratings of 60% G+E or less, with the exception of 2010, when the crop yielded 51.5 bushels. In both 2015 and 2017, mediocre late-July ratings failed to predict high yields, of 56 in 2015 and 58 in 2017. In 2014 and 2016, high ratings did predict high yields, of 56 and 59, respectively. Overall, high soybean crop ratings by late July tend to predict high yields, while low to medium ratings can sometimes be offset by August weather, resulting in average or even above-average yields. Because high crop ratings in late July predict high yields, we expect high soybean yields in 2018.

Another factor favoring soybean crop prospects this year is the rapid pace of crop development. Planting did not start early this year but it was finished early, and with May and June warmer than average, the crop was off to the races, with 44% of the crop flowering by the end of June. This continued into July, with 44% setting pods by July 15 and 66% setting pods by July 22. The 5-year average shows 24% of the crop setting pods by July 22, and about 50% by August 1. So the 2018 crop reached 50% podsetting about two weeks earlier than normal.

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An early start to podsetting should be favorable, as long as there's enough water to keep the crop in good shape. The amount of time between podsetting and loss of green leaf color (both recorded by NASS) estimates the duration of the seedfilling period, which is well-correlated with yield. On average, the Illinois reaches 50% leaf color change by about September 15, or about 45 days after 50% podsetting. The 2018 crop needs only to fill seed through the end of August to reach 45 days. With somewhat higher temperatures and longer days in August than in September, having seedfilling begin and end two weeks early should be favorable for seedfilling rate and yield.

We don't very well understand what signals the end of seedfilling, but both temperature and daylength have some influence. The number of pods that are filling, maturity rating of the variety, and other factors have some effect as well. If temperatures remain normal and the crop has enough water, the need to have days shorten to a certain length before seedfilling stops should mean a somewhat longer filling period this year; this should add yield. But with the early start, seedfilling should be adequate for good yields this year even if it ends by early September.

Other positive signs for the soybean crop this year are the excellent plant stands in most fields, the excellent condition and color of the canopy, and the large number of pods already formed and still forming. The canopy is outstanding in most fields now, and we expect it to take on a darker green color as podfilling gets up to full speed over the next two weeks. I have not heard much about fertilizer nitrogen application this year, but with the canopy in such good shape, it seems unlikely that the crop will need extra N. A fair number of fields have received fungicide, and probably insecticide as well, though we can probably call the "race" between canopy development and insect feeding in favor of the crop this year.

Soybean plants have grown tall due to warm temperatures and adequate water in most fields. Plants are at or close to their final height in fields where seedfilling has gotten underway. Periods of drier weather and warm temperatures have provided enough competition for water to keep the canopy in most fields from getting heavy enough to cause internal shading that can limit pod formation or seedfilling rates. We can probably expect some lodging, especially in 30-inch rows where plants are already tall. Moderate lodging as pods fill is a signal that pods are heavy, so is not a concern, especially if plants just "lean" without affecting light interception.

Counting pods and seeds on plants in mid-season is neither a lot of fun nor an overly accurate way to estimate soybean yield potential. But with pods setting early this year, it's a little easier to see how yield potential is shaping up. Pod numbers and number of seeds per pod appear to be very good in most fields. We'd like to see 4-5 pods filling at each middle node, and 30 to 50 pods per plant. A field with 130,000 plants per acre, 40 pods per plant, 2.8 seeds per pod, and 2,700 seeds per pound at harvest projects a yield of 90 bushels per acre. While we don't expect such yields in most fields, we have seen yields this high or higher in some fields in each of the past four years. Based on what we see now, we expect to see this in some fields in 2018 as well.

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