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How Many Days Does It Take to Plant the U.S. Corn Crop?

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April 19, 2018

farmdoc daily (8):70

Recommended citation format: Irwin, S. and T. Hubbs. "How Many Days Does It Take to Plant the U.S. Corn Crop?" *farmdoc daily* (8):70, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, April 19, 2018.

Permalink: <http://farmdocdaily.illinois.edu/2018/04/how-many-days-does-it-take-to-plant-us-corn-crop.html>

Corn planting progress in the U.S. is always a staple of market conversations this time of year. The cold and wet conditions (snow!) in the Corn Belt during the first half of April have severely limited fieldwork and corn planting. Naturally, there is great interest in what this implies for the timeliness of planting the 2018 corn crop in the U.S. Whether present conditions translate into substantial planting delays depends critically on the rate that corn planting can proceed once conditions improve. There has undoubtedly been substantial investment in large and technically sophisticated corn planters during the last decade. In addition, GPS auto-steer systems make it feasible to operate planters for more hours per day. As a result, it is not uncommon to hear the refrain that the entire Corn Belt can be planted in five good field days. The purpose of this article is to estimate the minimum number of suitable field days required to plant the U.S. corn crop based on historical planting progress data. Our work builds upon the analysis of issues related to the timeliness of corn planting in several previous *farmdoc daily* articles ([June 3, 2011](#); [March 23, 2012](#); [April 25, 2013](#); [May 22, 2013](#); [April 30, 2014](#); [May 20, 2015](#)).

Analysis

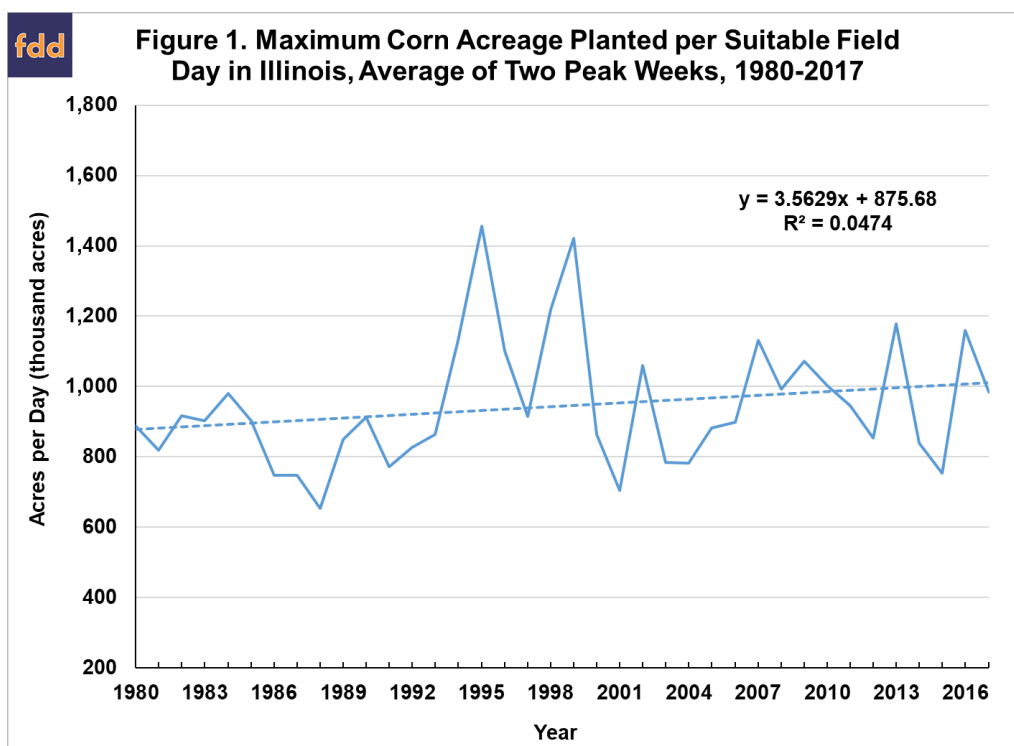
The analysis is based on planting progress data reported in the USDA's weekly *Crop Progress* report for Illinois, Indiana, and Iowa over 1980 through 2017. These three states contained 35 percent of the corn acreage planted in the U.S. during 2017 and are assumed to be representative of planting rates throughout the Corn Belt. We start by computing the number of acres planted per suitable field day each week that progress data is reported for each state. It is important to measure planting progress per suitable field day since this standardizes for the varying number of days during a week that are suitable for planting. Some weeks may have large reported planting progress but this could be due to an unusually high number of suitable field days rather than a high rate of planting progress per day. Since planting progress is reported as the percentage of total acreage planted, we multiply the percentage progress by total planted acreage of corn for each state in a given year to obtain planting progress in terms of acres. Note that 1994 is excluded for Indiana as we were not able to collect complete data on suitable field days that year. We recognize that the estimates of weekly planting progress and the number of days suitable for field work reflect some judgment on the part of reporters and therefore may not always be completely accurate. However, consistent reporting procedures over time should provide useful information for analysis.

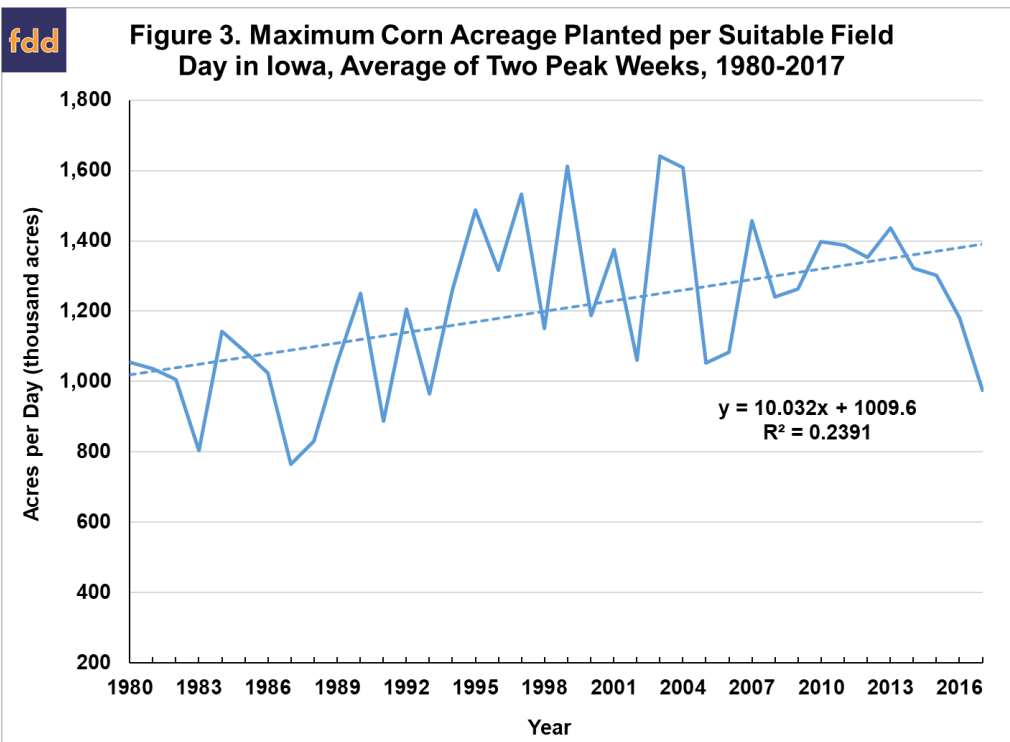
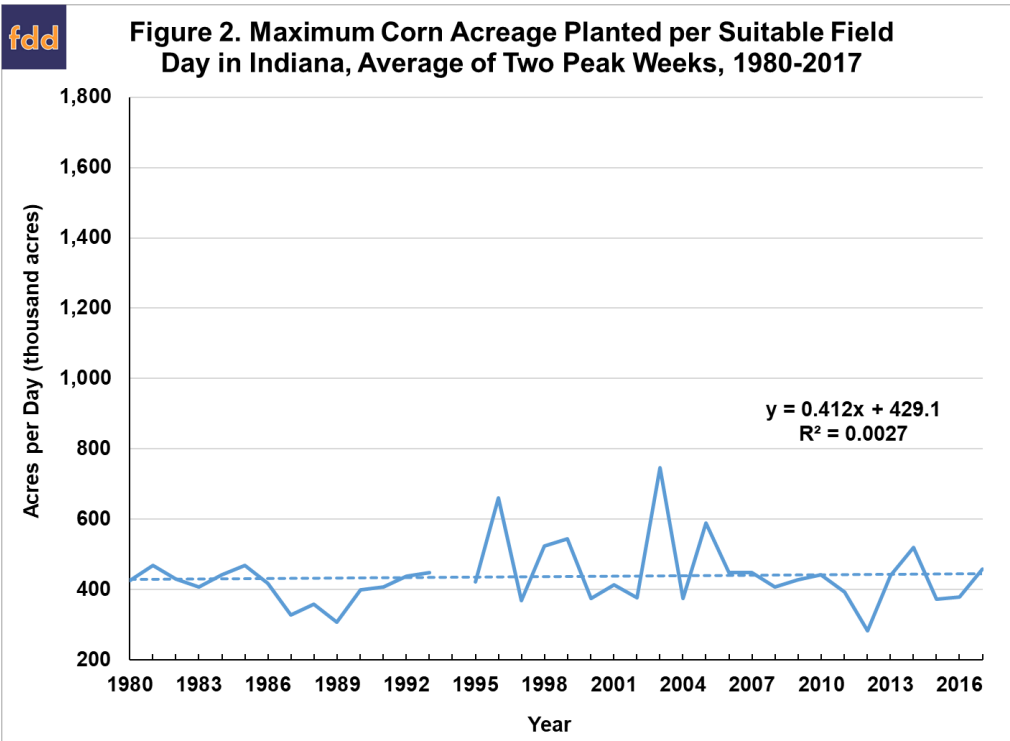
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Since we are interested in the minimum number of days that it is possible to plant the U.S. corn crop, we focus on weeks with the highest acreage planted per suitable field day. In other words, we want to know how fast the corn crop can be planted based on the highest rates of planting progress in the historical record. This should be kept in mind when considering the results of the analysis. Whether producers can actually maintain peak week progress for an extended period is uncertain. In addition, we average the progress per suitable field day for the two highest weeks each year in order to smooth out some outliers that appear in the single highest week each year.

Figures 1-3 present our estimates of the maximum corn acreage planted per suitable field day in Illinois, Indiana, and Iowa, respectively, over 1980-2017. The most surprising finding is the lack of a pronounced upward trend in the maximums for Illinois and Indiana. There is a slight upward trend for Illinois over the sample period, from about 900 thousand acres per day in the early 1980s to about 1 million acres per day in recent years. The maximum rate per day in Indiana shows virtually no trend since 1980, averaging a bit over 400 thousand acres. In both states, particular years show maximum planting rates much higher than the average. For example, the maximum rate in Illinois twice exceeded 1.4 million acres per day but this was back in the 1990s, long before the recent investment in planting equipment. The maximum rate of planting progress in Iowa exhibited a different pattern than the other two states. A pronounced upward trend is evident from 1980-2004, with the maximum rate increasing from around 1 million acres per day to around 1.6 million acres per day, an increase of 60 percent. After 2004, the maximum rate for Iowa leveled off and then dropped precipitously in the last two years, to the point where the maximum rate in 2017 was the lowest since the early 1990s. It is not clear what is driving the recent dropoff, as 2016 and 2017 were not historically extreme years of late planting. One possibility is that corn planting rates in the last two years are being constrained by producers planting soybeans earlier.

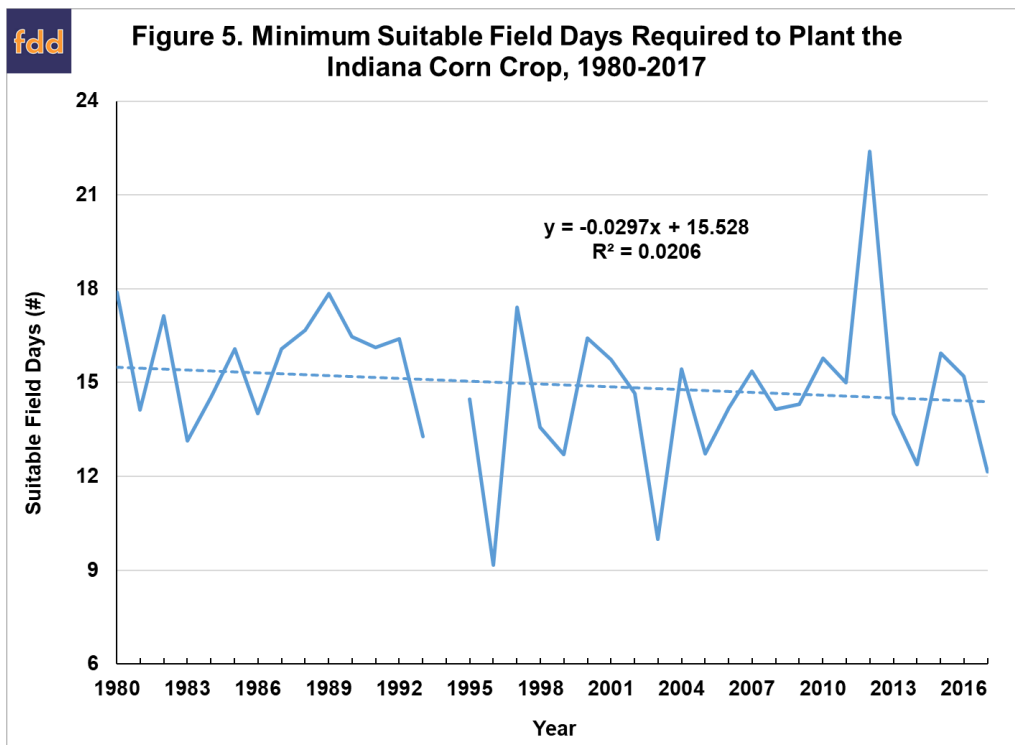
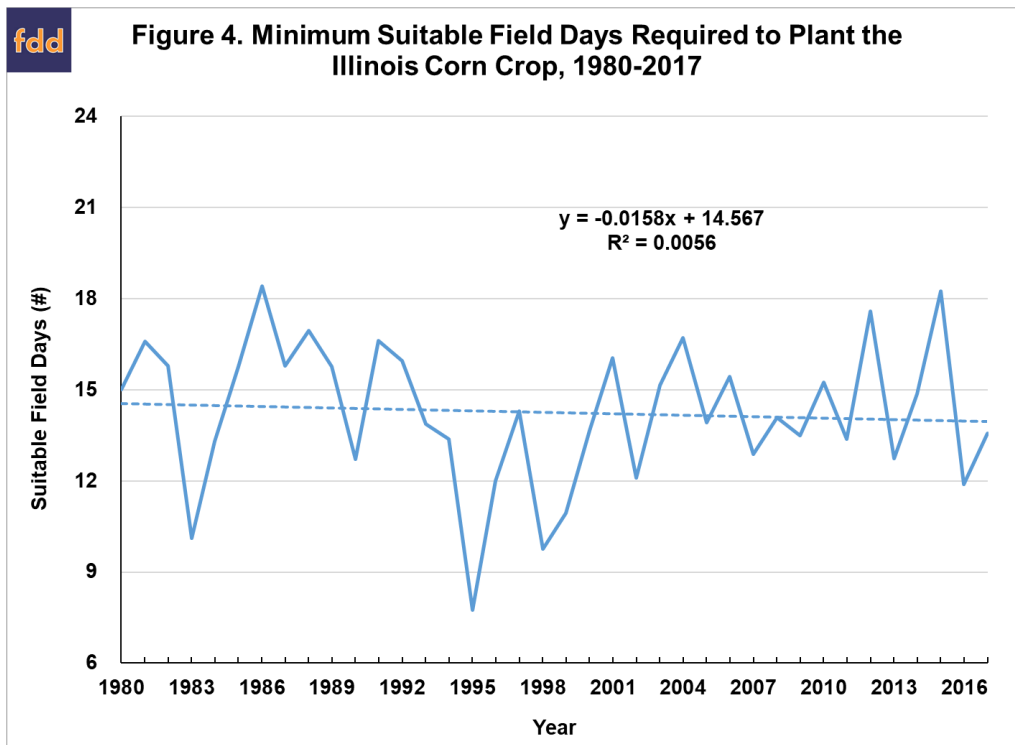
The estimates in Figures 1-3 show that maximum planting rates per suitable field day in the heart of the Corn Belt have not increased in a manner consistent with conventional wisdom. If we compare the early 1980s to the last couple of years, there is very little increase in the maximum rate at which corn acreage has been planted. This does not mean that maximum rates are absolutely capped at the estimated rates. It is possible that investment in planting equipment in the last decade has created extra capacity that simply has not been fully utilized. While this is a possibility, it could also imply an over-investment in planting equipment if this extra capacity is rarely used.

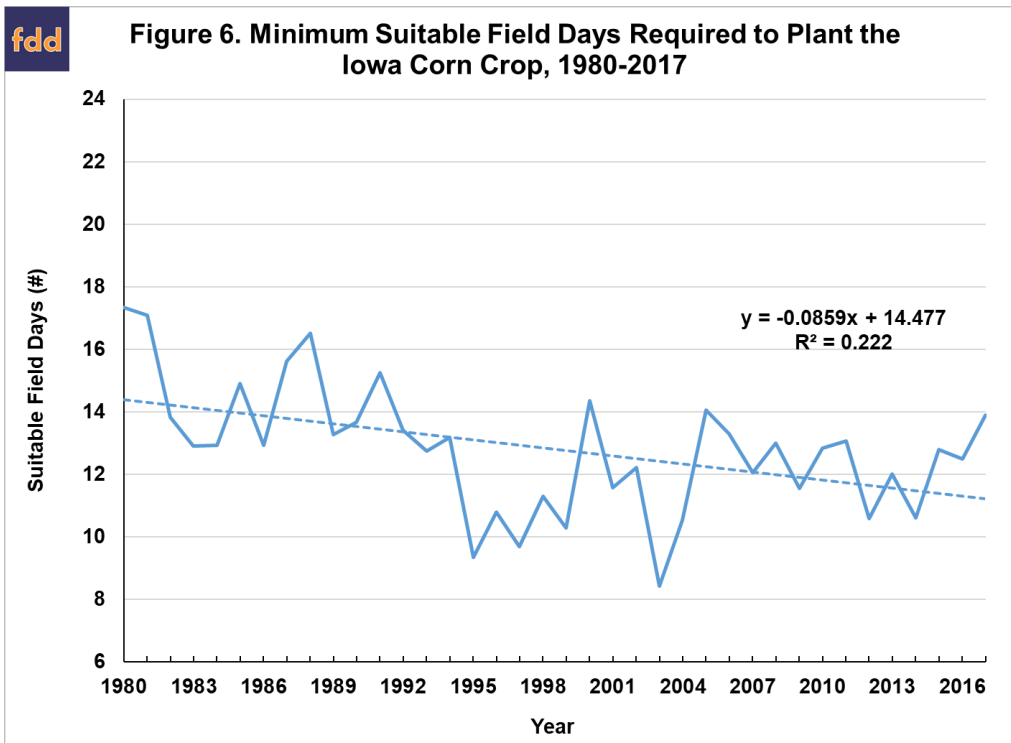




The next step of the analysis is to compute the minimum number of days required to plant the corn crop in each of the three states. We do this by dividing total planted acreage of corn in each state each year by the estimated maximum rate of corn planting progress per suitable field day shown in Figures 1-3. This provides an estimate of how fast the corn crop in the three states could be planted assuming the rate of daily planting is at the maximum. The computation also takes into account the changing total planted acreage of corn in each state over time. Figures 4-6 present the estimated minimums for Illinois, Indiana, and Iowa over 1980-2017. One is immediately struck by the stability and similarity of the minimum number of days required to plant the corn crop. There is a slight downtrend in the minimum number of days for Illinois and Indiana, from about 15 days in the early 1980s to about 14 days in recent years.

Mirroring the earlier results, the pattern for Iowa is different, with a notable decline through 2004 and a return in recent years to a similar number of days, about 14, as in the early 1980s. The results indicate that it takes about 14 suitable field days, or two weeks, to plant the corn crop in each of the three states assuming maximum daily rates of planting progress. Producers appear to size corn planting equipment such that the minimum number of days to plant the crop is roughly stable over time.





Implications

Conventional wisdom suggests that the U.S. corn crop can be planted in just a few days, perhaps as few as five suitable field days. This thinking is spurred on by the large size of modern planters that can obviously plant many more acres than the smaller planters of the past. However, this conventional wisdom is not borne out by historical data on planting progress for three states in the heart of the U.S. Corn Belt—Illinois, Indiana, and Iowa. We compute the minimum number of days required to plant the corn crop in each of the three states going back to 1980, assuming that planting progresses at the maximum rate per suitable field day in each year. The stability and similarity of the minimum number of days required to plant the corn crop is striking. While there is some variation in this estimates over time, on average, producers in Illinois, Indiana, and Iowa need about 14 suitable field days, or two weeks, to plant the corn crop based on maximum daily rates of planting progress. Assuming the three states are representative of the entire Corn Belt, 14 days is also an estimate of the minimum number of suitable field days needed to plant the entire U.S. corn crop. These results have important implications for expectations about the timeliness of corn planting in 2018, which has obviously gotten off to a very slow start. We plan to flesh out these implications in a *farmdoc daily* article next week.

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