

Days Suitable for Fieldwork in Iowa

File A3-25

The number of days available to complete tillage, crop protection, planting, and harvesting is an important consideration in selecting farm machinery. A large set of machinery will complete field work quickly, but will have high depreciation, interest, and other ownership costs. A smaller machinery set will cost less to own, but may not complete the job on time some years, which can lead to crop losses from late planting or harvesting.

Suitable Field Days

The size of machinery that can accomplish the necessary work most efficiently depends on how many days it can actually be used in the field. Estimates of the number of suitable field days that can be expected in each of the nine crop reporting districts in Iowa are shown in Table 1. These estimates are based on weekly records kept by the Iowa Field Office of the United States Department of Agriculture National Agricultural Statistics Office (NASS) from 1964 through 2019.

Estimates are listed for each week, and for multi-week periods (spring, summer and fall) corresponding to the times major field operations are normally performed. The values shown are the median number of days reported each week. There is a 50% chance that more days will be available in a given year, and a 50% chance there will be fewer. If field work will not normally be done on Sundays or holidays, values should be multiplied by 0.84.

Machinery Size

Once the number of days that will be available to perform field work is determined, the minimum daily machine capacity that is needed can be computed. For example, in northwest Iowa between April 30 and May 20, 3.8 plus 4.1 plus 4.7, for a total of 12.6 suitable field days can be expected.

If 1,600 acres of corn must be planted during this period, then an average of $1,600 \div 12.6 = 127$ acres must be planted each day in order to finish on time. If the planter can be operated 14 hours per day, a planter large enough to plant at least 9.1 acres per hour is needed ($127 \text{ acres} \div 14 \text{ hours}$). This does not take into account any non-working days, such as Sundays and holidays.

AgDM File A3-24, [Estimating the Field Capacity of Farm Machines](http://www.extension.iastate.edu/agdm/crops/pdf/a3-24.pdf), www.extension.iastate.edu/agdm/crops/pdf/a3-24.pdf, can be used to estimate the number of acres that can be completed per hour for different types and sizes of machines. Decision Tool A3-24, [Estimating the Number of Field Days Required](http://www.extension.iastate.edu/agdm/crops/xls/a3-24fieldcap.xlsx), www.extension.iastate.edu/agdm/crops/xls/a3-24fieldcap.xlsx, can be used to estimate the total number of field days required to complete a series of machinery operations, such as tillage and planting. These estimates can then be compared to the number of expected field days from this publication to test whether machinery capacity is adequate for timely planting and harvesting.

Actual Days Vary

The actual number of suitable field days will vary considerably from year to year. Figure 1 shows the statewide number of field days recorded each year for the period April 2 to June 17, when most tillage and planting operations are done. The number of days available varied from only 20 in 1993 to 60 in 1977. In 2019, only 26 suitable field days occurred, one of the lower numbers since 1964.

The straight line on the graph shows the trend in the number of field days over the period 1968 through 2019. The line has a downward slope, which means that the number of field days has been decreasing over time on average. The trend line value has dropped from 48 days to 35 days

since 1964, or almost one full day every four years. This means that the window for completing spring fieldwork in Iowa is shrinking significantly.

Adjusting for Fewer Days

Crop producers can adjust for fewer expected field days in several ways.

1. Invest in larger machinery, which can complete field operations over more acres per day.
2. Reduce the number of operations performed to cut down on the total hours of field time needed.
3. Outsource some operations to a custom operator or input supplier.
4. Improve the efficiency of field operations by using grain carts, seed tenders, auto-steer and other technologies that keep key machines running.
5. Install artificial drainage to extend the days for which fieldwork can be completed.

Summer and Fall Days

Figure 2 shows similar data for June 18 through September 9. Summer weather is less variable than spring weather. One exceptional year was 1993, when only about half the normal number of suitable field days occurred. Many fields were flooded through most of the summer.

Figure 3 shows the field days each year during the fall harvest season. Note that the two years with the fewest good days were 2018 and 2019. The number of good days has been declining in the summer and fall, as well, but at a slower rate than in the spring.

Figure 1. Suitable field days in the spring, Iowa average, April 2 to June 17

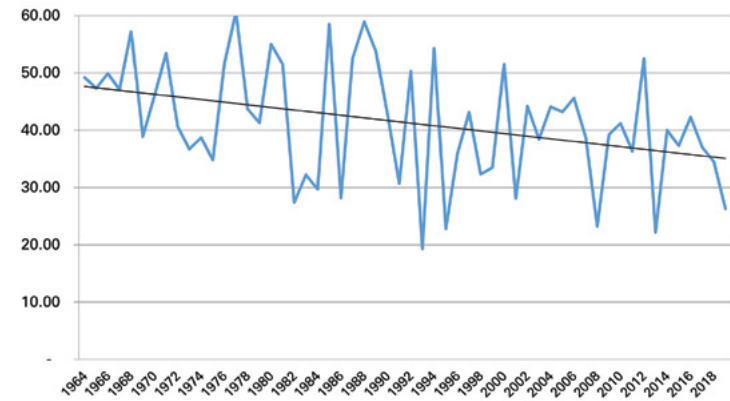


Figure 2. Suitable field days in the summer, Iowa average, June 18 to September 9

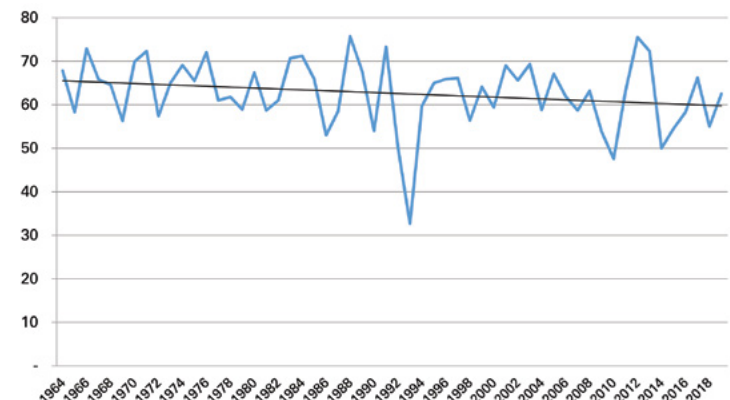


Figure 3. Suitable field days in the fall, Iowa average, September 10 to October 28

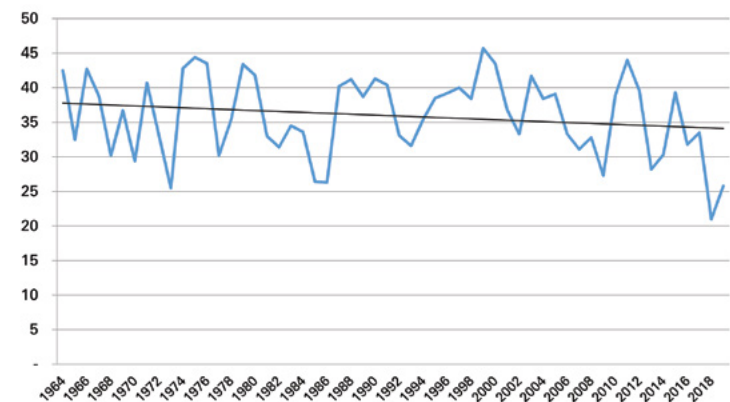


Table 1. Estimated Days Suitable for Fieldwork in Iowa

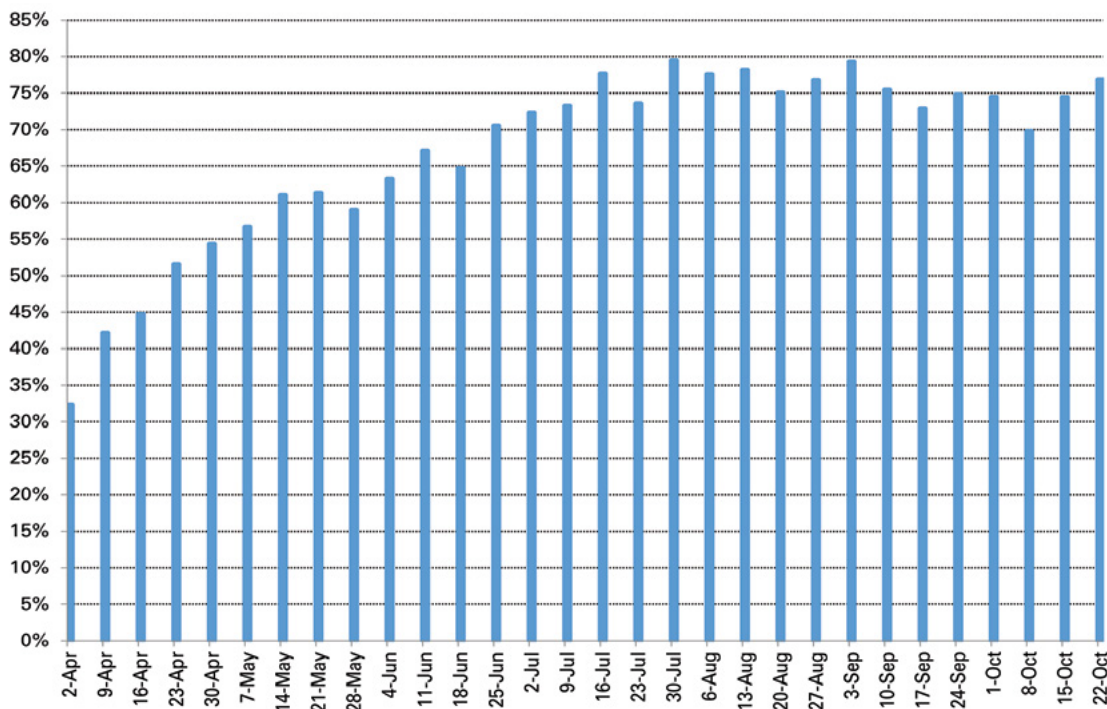
Week	Median Values, by Crop Reporting District, 1964 to 2019									
	North-west	North Central	North-east	West Central	Central	East Central	South-west	South Central	South-east	State
April 2 to April 8	1.1	1.0	1.3	2.7	2.4	2.1	3.4	2.9	2.4	2.1
April 9 to April 15	2.7	1.9	2.7	4.2	3.2	2.9	4.0	3.1	2.8	3.1
April 16 to April 22	3.1	2.5	3.2	3.6	3.4	3.4	3.5	2.8	3.0	3.1
April 23 to April 29	3.5	3.2	3.6	3.8	4.1	3.9	3.5	3.0	3.4	3.5
April 30 to May 6	3.8	3.6	4.2	4.2	4.1	4.0	3.7	3.1	3.7	3.9
May 7 to May 13	4.1	4.0	4.0	4.1	4.0	4.1	3.6	3.4	3.0	3.8
May 14 to May 20	4.7	4.7	4.7	4.5	4.7	4.1	4.5	3.7	4.0	4.6
May 21 to May 27	4.9	4.7	4.9	4.9	4.7	4.4	4.0	3.8	4.5	4.8
May 28 to June 3	4.6	4.5	4.4	4.7	4.2	4.7	3.4	3.7	4.0	4.4
June 4 to June 10	4.9	4.5	5.0	5.0	4.6	4.7	4.6	4.5	4.1	4.6
June 11 to June 17	5.0	4.8	5.0	4.9	4.5	4.9	4.8	4.2	4.3	4.9
June 18 to June 24	5.0	4.8	4.6	4.8	4.8	4.8	4.3	4.3	4.8	4.7
June 25 to July 1	5.4	5.0	5.5	5.8	5.1	5.0	5.7	5.7	5.0	5.4
July 2 to July 8	5.4	5.4	5.6	5.3	5.2	5.5	5.4	5.5	5.5	5.4
July 9 to July 15	5.5	5.5	5.5	5.6	5.3	5.7	5.6	5.6	5.9	5.6
July 16 to July 22	5.8	5.4	5.4	5.9	5.6	5.6	5.9	6.2	5.8	5.7
July 23 to July 29	5.5	5.3	5.3	5.5	5.4	5.4	5.7	5.7	5.4	5.3
July 30 to Aug. 5	6.1	5.9	5.7	5.9	5.9	5.8	6.1	6.3	6.1	5.8
Aug. 6 to Aug. 12	6.0	5.8	5.9	5.8	5.8	6.0	5.7	5.7	6.1	5.9
Aug. 13 to Aug. 19	5.6	5.8	5.7	5.8	5.7	5.7	5.8	5.9	5.9	5.7
Aug. 20 to Aug. 26	5.5	5.3	5.3	5.7	5.4	5.4	5.5	5.6	5.5	5.5
Aug. 27 to Sept. 2	5.8	5.6	5.6	5.7	5.5	5.6	5.9	6.0	5.8	5.7
Sept. 3 to Sept. 9	5.8	6.1	5.8	5.8	5.9	5.7	6.0	5.9	5.8	5.8
Sept. 10 to Sept. 16	5.2	5.7	5.9	5.5	5.6	5.8	5.5	5.4	5.6	5.7
Sept. 17 to Sept. 23	5.4	5.2	5.4	5.3	5.4	5.4	5.6	5.4	5.3	5.3
Sept. 24 to Sept. 30	5.3	5.5	5.6	5.6	5.7	5.8	5.8	5.8	5.8	5.5
Oct. 1 to Oct. 7	5.9	5.4	5.6	5.8	5.6	5.6	5.7	5.6	5.6	5.6
Oct. 8 to Oct. 14	5.2	5.2	5.2	5.2	5.4	5.4	5.3	5.0	5.1	5.1
Oct. 15 to Oct. 21	5.7	5.6	5.7	5.6	5.7	5.7	5.8	5.9	5.9	5.8
Oct. 22 to Oct. 28	5.7	5.6	5.7	5.7	5.8	5.5	5.6	5.4	5.7	5.7
Time Period	North-west	North Central	North-east	West Central	Central	East Central	South-west	South Central	South-east	State
April 2 to June 17	42.4	40.8	41.4	44.7	41.7	42.3	41.8	37.5	37.6	41.3
June 18 to Sept. 9	64.0	62.7	62.3	63.7	63.3	64.2	62.9	64.4	63.1	63.7
Sept. 10 to Oct. 28	35.0	35.9	36.6	36.8	36.4	37.4	36.7	36.5	37.0	36.8

Source: USDA, National Agricultural Statistics Service (NASS), Iowa Field Office, 1964-2019.

The probability of a day being suitable for field work in each week during the year is shown in Figure 4. Values after October are not shown because NASS stops collecting data once the corn and soybeans harvests are essentially completed, so data for later weeks is incomplete. In April, only 40% to 50% of the calendar days are suitable. The odds increase to 55% to 60% in May, and to about 65% in June. Throughout the summer and fall, the probability of a good day is generally around 75%.

Basing decisions about machinery investment and field operations on realistic estimates of the number of suitable field days available will result in lower overall costs and timely completion of planting and harvesting in most years.

Figure 4. Probability of a suitable field day, by week, for Iowa, statewide



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