

HOW EARLY CAN (SHOULD?) SOYBEANS BE PLANTED

Today's soybean production system in the Midsouth is the Early Soybean Production System (ESPS), which is based on early planting of early-maturing soybean varieties.

Ultra-early (mid-March through early April) planting of soybeans in the midsouthern US is now being perceived as a mechanism to additionally exploit early planting as a mechanism to avoid drought and ensure early harvest. The risks of planting in this timeframe are associated with temperature. Many years of observations and experience have shown that soil temperature likely is not a factor when planting this early. High-quality seed that are treated with fungicide to control both seed-borne and soil-borne diseases in these plantings will germinate and emerge. Emergence time may be extended by cold soils, but emergence will occur as long as adequate soil moisture is available.

The optimum planting window for the ESPS in the lower Mississippi River Valley is April 10-20. That being stated, there has never been a set date for the earliest allowed planting in this system. Some years such as 2012 and 2017 had March air temperatures at some locations in the region that were 5 deg. or more above normal, and this caused some producers to consider planting soybeans ultra-early, which is arbitrarily defined as anytime before about Apr. 5. So this raises the question "what are the advantages and/or disadvantages realized from ultra-early planting?"

Knowledge of when the last date of a particular low air temperature is estimated to occur is important. See the below table that presents the 10% (1 year in 10) and 50% (5 years in 10) estimates for expected last spring frost (36°) and last spring freeze (32°) dates for selected locations in the Midsouth where ultra-early planting likely will occur.

The safest early planting time is usually dictated by the estimated last frost date for a given location that generally favors planting in the above optimum window. From Memphis south, the 50% or average last spring frost is estimated to occur from mid-March to very early April. Thus, when considering that emergence of early plantings likely will take 10 to 14 days, planting in the late March to early April timeframe is not a high risk activity from the standpoint of average date of last spring frost south of Memphis.

As stated above, the greatest risk with ultra-early planting is perceived to be from low air temperature that occurs after soybean emergence. There are known cases of soybean seedlings surviving frost after emergence, but the severity

and duration of these cold temperatures are not documented. Presumably, there is a difference in how 2 hours at 36 degrees that may result in a light frost and 8 hours at 33 degrees that may result in a heavy or "killing" frost will affect soybean seedlings. However, there is no documentation of just what level of frost is required to be detrimental to emerged seedlings. To be on the safe side, normal- and ultra-early plantings should be timed so that emergence will occur after the estimated 50% last spring frost date for a given location.

Regrettably, there is a paucity of data that can be used to definitively determine just how early soybeans can be planted in the Midsouth to achieve respectable yields. However, Dr. Trey Koger provided a slide he prepared from 2 years of data collected from plantings that were made starting in January on a nonirrigated clay site near Stoneville MS (lat. 33°26' N) using MG 4.7 varieties. Click [here](#) for those data that show there is no yield advantage to planting before mid-April. Be reminded that, even though these data show that good yield can be achieved from plantings made prior to that period, yield potential will depend on there not being a frost or freeze that will negatively affect plantings made prior to mid-April.

Plants in plantings made during the above defined ultra-early period will begin flowering very soon after emergence, and will likely be shorter than desired. This, plus the fact that pods on these plants likely will be close to the ground, will reduce harvest efficiency. Also, the shorter plants in ultra-early plantings dictate that they be grown in narrow rows, or rows that are 20 in. or less in width. Otherwise, these short plants will not form a canopy, thus promoting problems such as season-long weed infestations that will be difficult if not impossible to manage.

A logical question that will arise when considering ultra-early planting is "what maturity group (MG) should be planted in these plantings?". Years of research results in the lower Midsouth show that indeterminate MG IV varieties work best in early soybean production system plantings, or those usually made in the optimum planting date window. Will planting earlier than this dictate using varieties from MG's that are earlier than MG IV's?

There are no definitive answers to this question. However, certain facts are known about using MG III's in these ultra-early plantings.

- MG III's will have about a 2-week shorter growing

season, and thus less exposure to abiotic and biotic stresses during the hottest, driest part of the growing season.

- MG III varieties will be shorter than MG IV varieties, and this may pose canopy and harvest problems on clayey soils.
- MG III varieties planted in late March/early April will be ready for harvest in late July/early August, whereas MG IV varieties will be ready for harvest in mid- to late-August, which amounts to about a 2 week difference.
- MG III's normally will require one less irrigation to achieve their maximum irrigated yields. This makes them an attractive alternative to MG IV's in areas with limited irrigation water.

- Their shorter growing season (~124 to 128 days vs. ~138 to 142 days for MG IV's) provides less time for them to recover from short-term stresses that may occur, especially during reproductive development.
- MG III varieties will not yield as well as MG IV varieties in both nonirrigated and irrigated settings, presumably because of their shorter time from planting to maturity. Click [here](#) and [here](#) for research results from Arkansas and Mississippi.

As with all things agronomic, there will be exceptions to all of the above. But since most agronomic recommendations are based on the generally best set of circumstances, the above should be considered before making the decision to plant soybeans before the perceived optimum planting window dates in the Midsouth.

Click [here](#) for tips that apply to all early soybean plantings in the Midsouth.

TABLE 1. Midsouth locations, their latitudes, and estimated* 50% and 10% last spring frost (36°) and last spring freeze (32°) dates.

Location	Latitude	50% last frost	10% last frost	50% last freeze	10% last freeze
Alexandria LA	31°18' N	Mar. 16	Apr. 8	Feb. 27	Mar. 23
Vicksburg MS	32°21' N	Mar. 30	Apr. 14	Mar. 20	Apr. 8
Shreveport LA	32°30' N	Mar. 30	Apr. 17	Mar. 10	Mar. 31
Lake Providence LA	32°48' N	Mar. 19	Apr. 6	Mar. 4	Mar. 27
Stoneville MS	33°26' N	Mar. 28	Apr. 13	Mar. 11	Mar. 31
Paris TX	33°41' N	Mar. 31	Apr. 14	Mar. 18	Apr. 6
Rohwer, AR	33°45' N	Apr. 2	Apr. 15	Mar. 20	Apr. 6
Dumas AR	33°52' N	Apr. 3	Apr. 15	Mar. 13	Mar. 31
Clarksdale MS	34°12' N	Mar. 30	Apr. 13	Mar. 14	Apr. 4
Marianna AR	34°46' N	Apr. 8	Apr. 18	Mar. 25	Apr. 10
Memphis TN	35°09' N	Apr. 1	Apr. 14	Mar. 22	Apr. 9
Jackson TN	35°37' N	Apr. 12	Apr. 24	Apr. 6	Apr. 18
Keiser, AR	35°40' N	Apr. 12	Apr. 24	Mar. 31	Apr. 13
Jonesboro AR	35°50' N	Apr. 10	Apr. 21	Mar. 29	Apr. 13
Union City TN	36°25' N	Apr. 16	Apr. 30	Apr. 5	Apr. 18
Sikeston MO	36°52' N	Apr. 12	Apr. 25	Apr. 2	Apr. 19

*Probability of later date of occurrence. For 50% dates, there is a 50% chance (5 years in 10) of occurrence later than date shown. For 10% dates, there is a 10% chance (1 year in 10) of occurrence later than date shown.

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