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On The Farm

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Potential for Ultra-Early and Early Planted Soybeans in Alabama

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Cherokee County farmers Nick McMichen and son-in-law Tyler Bruce stand in their 2018 non-irrigated April 23 planted soybean field that averaged 88 bushels per acre. The field was hit by mid-30 degree weather in late April and sustained cold damage but still yielded well.

Ultra-Early Planted Soybeans in Alabama
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Most farmers would probably say that corn benefits more from early planting than soybeans. Research from the Mid-West and field experience from the Southeast recognize that soybeans may actually benefit more by increasing yields from 5-15% over traditional May planted soybeans.

Three factors that play a critical role in high soybean yields are adequate moisture/irrigation; planting date; and solar radiation (sunlight) during pod fill. The earlier growers can plant in Alabama, the more likely they can take advantage of all three factors. I would consider soybeans planted in mid-April through May 1 as early planted soybeans and ultra-early planted soybeans would be planted in very late March through mid-April in Alabama. The soil and weather conditions may not always allow farmers to plant this early in Alabama, especially in North Alabama, but some years there will be a window of opportunity to plant ultra-early soybeans.

Let's look at what research shows is the most optimal planting dates for high soybean yields in states far to the north of us before we summarily dismiss the notion of ultra-early planted soybeans in Alabama. University of Illinois research showed near maximum soybean yields when planted in mid-April to early May.

Iowa State University research recommends the optimum time to plant soybeans in the southern two-thirds of the state if soil conditions are suitable is April 25. Twenty years of data in Indiana has shown the ideal soybean planting window is between April 16 and April 30. The early soybean production system (ESPS) is well defined in the Mid-South with Arkansas and Mississippi doing most of the research. Their ideal planting date is April 10-20.

The ideal soil temperature for rapid soybean germination and emergence is 77 to 86 degrees F but despite cold soil temperatures and slow plant growth during the seedling stage, there is a yield advantage from early planting. The soybean varieties today have better seedling vigor and cold tolerance than in the past. Also seed treatments and in-row fungicides allow for earlier planting. Although soybean germination has been reported in soil temperatures as low as 36-39 degrees F, the soil planting depth temperature should be 55 degrees F or above with a warming trend forecast for the next 5-7 days to plant ultra-early soybeans.

There is concern that a late frost may mean replanting ultra-early soybeans, but the risks aren't as great as growers suspect. Temperatures at or below 28-30 degrees F for several hours are usually needed to kill soybean tissue. Air temperatures at 28-30 degrees F doesn't mean freeze damage; it means the temperature surrounding the soybean seedling needs to be this low for freeze damage to occur. The temperature surrounding the soybean seedling are usually buffered by heat being radiated from the soil. However, older soybean are less freeze tolerant than seedlings.

Growers usually plant corn first because it is at lower risk from freeze damage since the growing point is below the ground until V5-6, but soybeans are able to compensate for a partial stand unlike corn. In planting date studies at the University of Minnesota since the 1980s, stands planted in April and later have rarely been injured by frost. Fortunately injured stands were not reduced to a level needed to replant and yielded just as well as later, unfrosted planting dates.

The benefits of planting ultra-early soybeans in Alabama are:

- Higher potential yields and profitability
- Shorter plants and less lodging
- Non-irrigated soybeans may benefit from better moisture early for planting and early growth
- Flowering and pod set occurs during longest days
- Longer reproductive period and greater seed filling rate
- Potential for earlier harvest and more positive basis
- Less chance of some diseases such as soybean rust
- If planted in nematode infested fields, gives the soybean plant time to get established before nematode populations explode

The risks of planting ultra-early soybeans in Alabama are:

- Late spring frost and risk of replanting
- Risk of more seedling disease and Sudden Death Syndrome (SDS)
- Weather pattern may not always benefit ultra-early planted soybeans
- The indeterminate varieties are at more risk to seed decay and poor quality because seed maturity occurs during warmer temperatures and more chance of rainfall.
- They need to be planted at the same time we are planting corn and harvested when we are harvesting corn.

The longest day of the year is June 21 and days become shorter after June 21. Indeterminate soybean varieties planted earlier will begin pod fill during the longest days of the year and take advantage of the highest amount of solar radiation (sunlight). This allows maximum photosynthesis where the plant converts sunlight into sugars. These sugars are the energy source for the soybean plant and seed production. Indeterminate varieties are not as photoperiod sensitive as determinate varieties allowing them to be planted earlier.

Growers will need to weigh the risks against the benefits before deciding if ultra-early soybeans will fit into their production schedule. Here are a few suggestions if a grower is going to try the ultra-early soybean production system:

- Try it on a limited number of acres until you develop a management system for your farm.
- Uniform stand establishment can be expected after soil temperatures reach 50 degrees F but wait until the reach 55 degrees F and a waiting trend is forecasted for the next 5-7 days.
- A soybean seed treatment for seedling diseases should be used.
- An in-furrow fungicide and seed treatment for SDS is encouraged.
- When planting in less than ideal conditions, seeding rates of 130,000+ seed per acre are advisable.
- Timely harvest is critical and a harvest aid is prudent.