Soybean Row Spacing, Plant Population, Planting Date and Water Management

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Three Factors Influence Your Ability to Optimize Your Soybean Yields:

* Soil Type/Conditions
* Seasonal Water Supply
* Your Management

PLANTING DATES

Picture Date: 6/28/2003
22 May
17 May
10 May
16 Jun

Picture Date: 6/24/2004
24 Apr
14 May
10 May
13 Jun

Plant Early - Optimize Yield

Seed Yield (bu/acre)

y = -0.237x + 9014.6
y = -0.6340x + 24001

Calendar Date
25-Apr
15-May
4-Jun
24-Jun

2007 SMFD – University of Nebraska – Lincoln Extension
Plant Early – More Nodes

- Main Stem Node (no.) vs. Calendar Date
- Data for 2003 and 2004

Plant Early – Crop Height Effect

- Plant Height (cm) vs. Calendar Date
- Data for 2003 and 2004

Plant Early – But Do It Right!

- Know the calendar date of last-ever spring frost for your area.
- Plant no earlier than 14 days prior to that calendar date.
- Use a variety with slightly later flowering (i.e., later maturing).
- Use high quality seed and consider treating with a fungicide & insecticide!
No-till Water Savings, inches

<table>
<thead>
<tr>
<th>Tillage per trip</th>
<th>0.5 - 0.75</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaporation</td>
<td>2.5 - 5.0</td>
</tr>
<tr>
<td>Infiltration</td>
<td>2.0 - 6.0</td>
</tr>
<tr>
<td>Total Savings</td>
<td>5.0 - 12.0</td>
</tr>
</tbody>
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Estimated Soybean ET (mm/day)

Vegetative Stages
- Germination and Emergence
- Rapid Vegetative Growth

Reproductive Stages
- Flower R1-R2
- Pod Development R3-R4
- Seed Fill R5-R6
- Maturation R7-R8

Learn how to increase available soil water by reducing runoff and evaporation

Observe row spacing, population, and planting date influences on plant development

Understand the yield components of number of plants, seeds per plant, and seed size

Learn about water needs for the various plant growth stages and seed development stages
**Soybean Yield versus Water**

Some Typical Varietal Responses in Nebraska

**Soybean Irrigation Recommendations:**

5. Skip irrigation during flowering (R1-R2) to minimize disease risks of rust & white mold, and to lessen lodging potential.

6. Always irrigate at pod elongation (R3-R4), the most yield-sensitive R-stage. Delivers max “yield bang” for the “irrigation buck”.

7. Continue irrigation during seed-filling (R5-R6) as August water is more critical for soybean than corn. Don’t stop too soon!

**Soybean Irrigation Recommendations:**

1. Capture off-season snow and rainfall, to store and conserve it as soil water.


3. Plant a variety with a high yield-to-water response (3 bu/ac per inch).

4. Avoid irrigating during vegetative growth to ensure a deep and wide root system.

**Soybean Irrigation Pointers:**

1. If your crop rotation is corn/soybean and you are not achieving a long-term Corn/Soy yield ratio of 3.25 (examples: 175/53.8, 200/61.5, 225/69.2, 250/76.9), then you are likely mismanaging one of the two crops.

2. Soybean yield response to water is linear and a high-yield variety delivers 3.5 bu/ac per inch of irrigation. With 8 inches of water, you could apply all 8 inches to a 100-acre field or apply 1 inch over a 800-acre field. How many here would take the first option?
**Soybean Irrigation Pointers:**

3. Some irrigation scheduling models treat the top 3-ft of soil zone as fully loaded with roots. Actually only the root hairs absorb water, and they mine soil water from a given layer before moving to the next soil layer.

4. Some irrigated producers think that they can plant late and use irrigation during vegetative growth to bring the crop back to a plant height similar to an earlier planted non-irrigated field. How many of you do this?

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**Take Home Messages**

- Don't destroy soil structure with tillage and lose soil moisture
- Use residue cover to reduce erosion, crusting, and evaporation
- Select the proper maturity and plant early
- Irrigate primarily during pod fill, sparingly before that
- Don't shut off too early, fill those pods
Water enters roots ONLY through root hairs.

Thus, most of the root system is nothing more than a water-tight conduit system (think pipes) delivering water collected by root hairs to the plant!