

2006 SMFD

Management for Improving Crop Water Use

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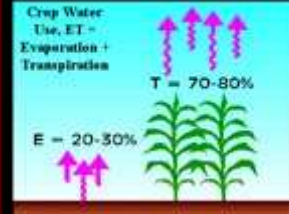
2006 University of Nebraska-Lincoln
Extension SFMD

Management for Improving Crop Water Use

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06smfd-water001



Growing season evaporation from irrigated soil surface, inches

	No Crop		Crop Canopy	
	Bare	Straw	Bare	Straw
	15.1	8.5	7.6	3.8
	14.6	9.4	8.5	5.7

WCREC, North Platte

Irrigation season (June-Sept)
evaporation savings, inches

	Soybeans		Corn	
	Corn 1	Corn 2	Wheat 1	Wheat 2
	2.70	2.68	3.13	3.06
	4.24	2.82	3.83	2.85



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Sat. Infiltration, in/hr

	Wheel Track	Soft Middle
	Tilled	0.2
No-till	0.6	4.0

Rogers Memorial Farm

Tillage System	Soil Permeability in/hr	Rainfall Rate for Runoff in/hr
Disk	0.4	1.5
Ridge-plant	1.5	3.2
Slot-plant	4.0	6.4

SCREC, Clay Center

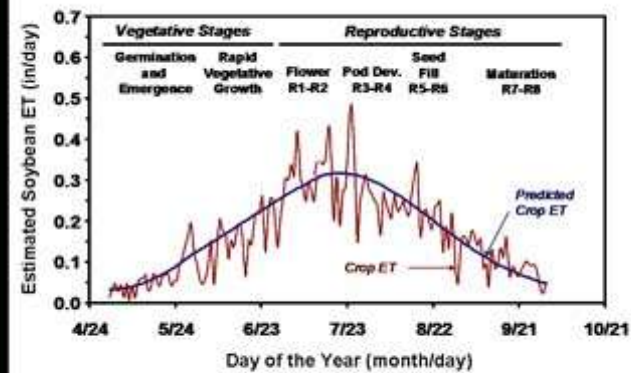
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No-till Water Savings, inches

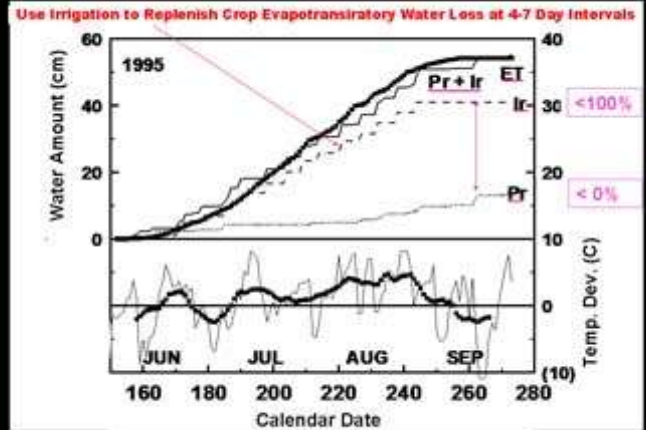
Tillage per trip	0.5-0.75
Evaporation	2.5 - 5.0
Infiltration	2.0 - 6 ?
Total Savings	5.0 - 12 ?



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06smfd-water006

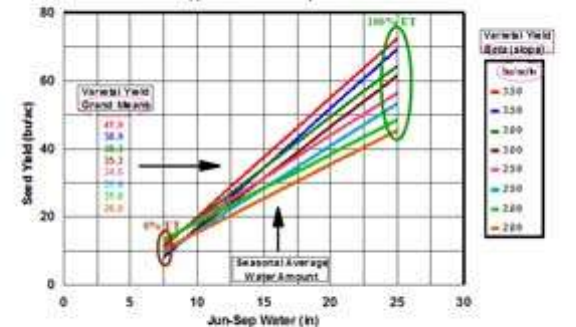
Soybean Irrigation Recommendations:

1. Capture off-season snow and rainfall, to store and conserve it as soil water.
2. Minimize in-season evaporative loss of soil water (early planting >> early canopy).
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.

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Soybean Yield versus Water

Some Typical Varietal Responses in Nebraska

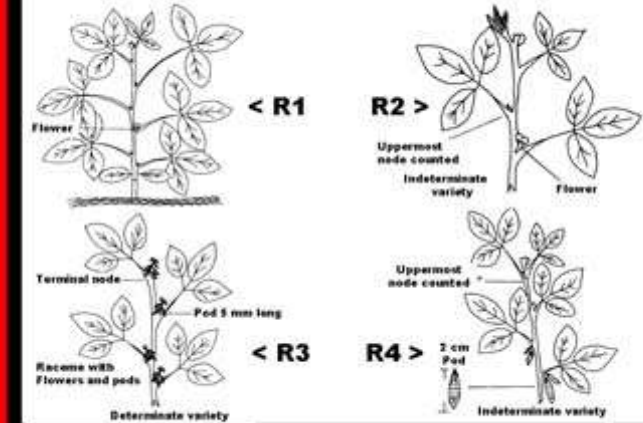


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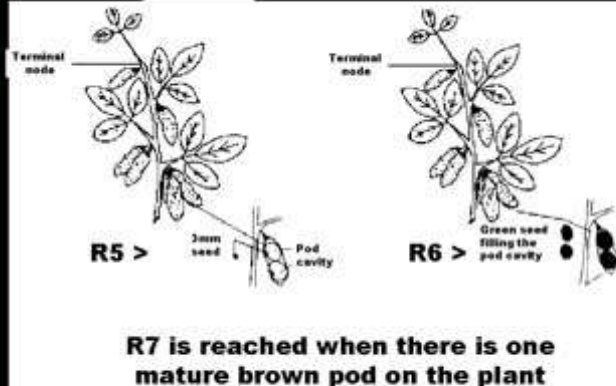
Soybean Irrigation Recommendations:

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!

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Three Factors Influence Your Ability to Optimize Your Soybean Yields:

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

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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?

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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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Soils Differ for Available Water

Soil Texture	Available Water (in/ft)	
	Range	Typical
Fine sand	0.7 - 1.1	1.0
Sandy loam	0.9 - 1.5	1.4
Loam	1.2 - 2.3	1.8
Silt loam	1.4 - 2.6	2.0
Silly clay loam	1.5 - 2.5	2.2
Clay	1.6 - 2.2	1.8

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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

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PLANTING DATES

Picture Date: 6/26/2003

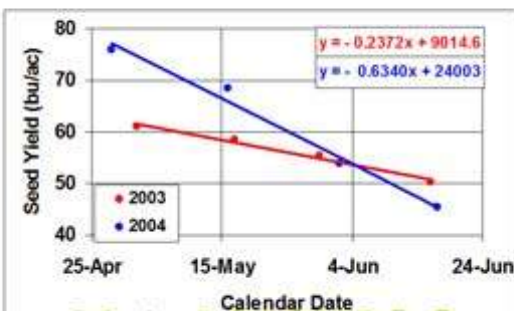


Picture Date: 6/24/2004



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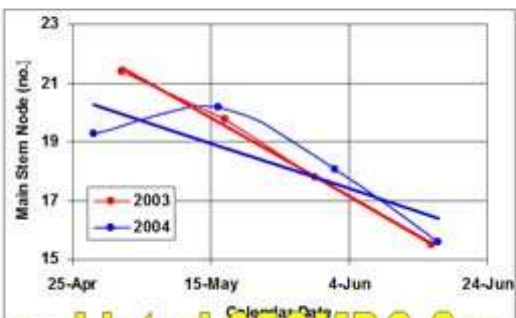
Plant Early - Optimize Yield



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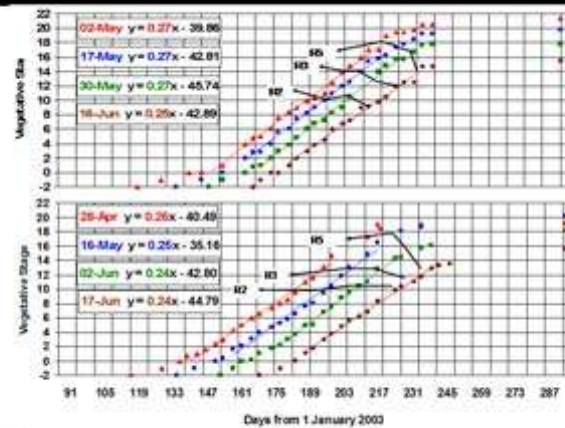
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Plant Early - More Nodes



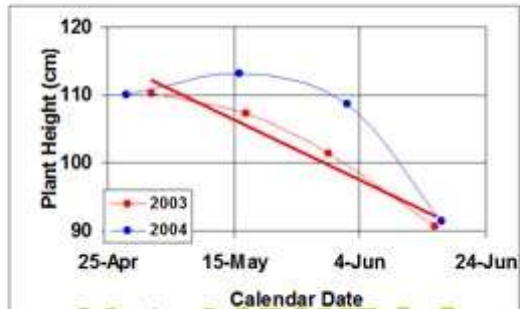
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Plant Early – Crop Height Effect



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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!

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Soil Moisture Losses
 $\frac{1}{2}$ to $\frac{3}{4}$ inch per trip

Typical Fuel $\frac{3}{4}$ gal/A
 Custom Rate \$7.00/A



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