2004 Solution Days

All Sessions
Soybean Irrigation Recommendations

1. Maximize infiltration of off-season rainfall (and snowmelt) PLUS minimize pre- & in-season evaporative loss of soil water.

2. Avoid irrigating during the vegetative period unless absolutely needed.
**Soybean Irrigation Recommendations**

3. Avoid irrigating during the (R2-full) flowering stage.
4. ALWAYS irrigate during the (R3-R4) pod elongation stage.
5. Irrigate on an "as-needed" basis during the (R5-R6) seed enlargement stage.

---

**Hard-Core Soybean Irrigation Questions**

1. If you produce both irrigated Corn and Irrigated Soybean and your Corn Yield / Soybean Yield Ratio is not equal to 3.15 (examples: 175/55.6; 200/63.5; 225/71.4; 250/79.4; 275/87.3), then you are mistreating one or the other crop. Which one do you usually mistreat?

2. Monitoring the soil water content in the root zone allows you to determine how much water to apply at any given irrigation; however, using only soil water content to also determine when to schedule irrigations ignores how the soybean plant "feels" about the "timing" of the irrigations it receives. *Do you even care?*

3. You have been allocated only enough ground (or surface) water for your next soybean irrigation to apply one-inch to 200 acres or two inches to 100 acres or four inches to 50 acres. Which wrong choice to you usually make?

---

**Hard-Core Soybean Irrigation Questions**

4. A "depth of the crop root zone" parameter that increases during the growing season is employed in most irrigation scheduling models, and it is this depth of soil that is monitored for soil water depletion. The name of this parameter implies there are roots everywhere in that zone.

*True or False?*
Soybean Yield versus Water

Soybean Planting Dates in Iowa, ISU, 1995-1997

Conclusion
- 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

2004 University of Nebraska-Lincoln
Extension Solution Days
PRESENTED BY

Jim Erwin
Regional Sales Agronomist
Syngenta Seeds, Inc.

Loren Giesler
Plant Pathologist
University of Nebraska-Lincoln

Solar Radiation:
Timing & Effects of Radiation Changes on Yields and Disease
- Solar radiation trends the last 5 years
- The interaction of heat units and sunlight on yields and stress
- The effect solar radiation on incidence and severity of diseases
- How to manage the unmanageables

2004soldays025  2004soldays026

What Happened?
- Why were yields so high?
- What did you do differently to achieve those yields?
- Will this trend continue?
- How do I manage the unmanageables?

2004soldays027  2004soldays028

Solar Radiation
Grand Island, Nebraska

2004 University of Nebraska-Lincoln
Extension Solution Days
2003 GDU's

- Below Normal in May & June
- Above Normal Mid July Thru August
- Followed Solar Radiation Pattern

2003 vs Average

GDU's and Solar Radiation

2003 vs 2004

2004

2004 University of Nebraska-Lincoln
Extension Solution Days
What Can I Do About it?

- Plant early.
- Plant hybrids that have a range of flowering dates. The earlier the better.
- Plant hybrids that have different grain fill period lengths.

Stalk Rot Development

- 75-90% Kernel Carbohydrate from Upper 2/3 of Plant

Common Stalk Rots

Soybean Rust

Global Distribution
**Soybean Rust**

- Symptoms not like other rusts
- Look alike diseases are:
  - Bacterial Blight
  - Bacterial Pustule
  - Septoria Brown Spot

**Soybean Rust Management**

- Fungicides:
  - Myclobutanil
  - Propiconazole
  - Azoxystrobin
  - Chlorothalonil
- Host Plant Resistance
- Planting Date

---

**Irrigated & Rainfed Corn/Soybean Yield Ratios (bu/ac) Over Time**

Presented by:

- **Bill Kranz**
  - Extension Irrigation Specialist
  - University of Nebraska-Lincoln

- **Roger Selley**
  - Extension Farm Management Specialist
  - University of Nebraska-Lincoln

2004 University of Nebraska-Lincoln Extension Solution Days
Drip and Sprinkler Irrigation Technology

- Effect of sprinkler packages and drip on water application efficiency and operating pressures
- System components for sprinkler and subsurface drip irrigation systems

Drip and Sprinkler Irrigation Technology

- Investment and estimated ownership and operating costs for alternative sprinkler and drip systems
- Effect of field size and shape on system costs
- Considerations when converting existing irrigation systems

Understand where the water losses are

- Canopy evaporation and plant transpiration trends during irrigation
Sprinkler Package Cost Determined by?
- System pressure
- Application efficiency
- Initial cost of sprinklers as well as power unit and pump needed

System Pressure Affects Head
Lift + 2.31 x PSI

- Number of bowls (replacement cost/hr & interest)
- Power Unit Size (repair and replacement/hr, interest & hookup cost)
- Water Horse Power (fuel & oil cost/hr)

Application Efficiency determines water pumped and pumping hours to meet needs.

Need 12 Ac In/130 Acre Field?

<table>
<thead>
<tr>
<th>Applic Effic</th>
<th>Pump Ac In/Ac</th>
<th>800 gpm Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>85%</td>
<td>14.1</td>
<td>1030</td>
</tr>
<tr>
<td>90%</td>
<td>13.3</td>
<td>972</td>
</tr>
<tr>
<td>95%</td>
<td>12.6</td>
<td>921</td>
</tr>
</tbody>
</table>
**SSDI**

*Sub Surface Drip Irrigation*

**Pros for SSDI**

- Water savings
- Energy savings
- Materials/labor savings
- Fit irregular fields

**Cons for SSDI**

- Initial Cost
- Rodent Damage
- Emitters Plugging
- Rolling Terrain

**Dry Surface**

- Germination May Be a Problem
- Better Weed Control
- Allows Field Operations
Water Pumped

Eg 15 Ac In Required

<table>
<thead>
<tr>
<th></th>
<th>Effic</th>
<th>Ac In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furrow</td>
<td>65%</td>
<td>23.1</td>
</tr>
<tr>
<td>Pivot</td>
<td>90%</td>
<td>16.7</td>
</tr>
<tr>
<td>SSDI</td>
<td>95%</td>
<td>15.8</td>
</tr>
</tbody>
</table>

Energy Savings

- Pump Less Water
- 5 to 15 psi

Other Changes?

- Yields
- N Fertilizer
- Weed Control
- Labor
- Management

Presented by

Rob Wilde
Product Development Manager of New Traits
Syngenta Seeds, Inc.
New Technologies: The Future is Here Today

- New Bt Technologies
- New Marker Systems
- New Vips Technology
- New Stacking Technology

Input Traits for Corn

Choice

- Syngenta’s traits to be available through a wide variety of seed companies
  - Through NK® brand and, after acquisition closure, Garst® and Golden Harvest brands
  - Through inbred and technology licenses
- Technology will strengthen the broader Syngenta offer of herbicides, insecticides, fungicides and branded germplasm

Glyphosate Tolerance

- Syngenta has acquired rights, together with a license to IP necessary to commercialize event GA21
- GA21 has been sold in the USA since 1999
- Target launch under Syngenta brands in 2005
- Will be offered with Syngenta’s insect control traits as soon as the stacked products are registered with the relevant authorities
**Corn Borer Control**
- New event to control European (ECB) and Southwestern Corn Bokers (SWCB)
- Proprietary technology based on the *Bacillus thuringiensis* full-length Cry1Ab delta-endotoxin
- Event 3243M shown to be highly efficacious against ECB and SWCB
- Currently growing under an EUP, allows >10 acres (still crop destruct)

**ECB & SWCB Control**

**Lepidopteran Control**
- New technology to control Black Cutworm (BCW), Corn Earworm (CEW) and Fall Armyworm (FAW)
- Proprietary technology based on the *Bacillus thuringiensis* vegetative insecticidal protein (Vip3A)
- Event MIR152V shown to be highly efficacious against BCW, CEW and FAW
- Stack with Cry1Ab for broad lepidopteran control

**BCW & FAW Control**
Corn Rootworm Control

- New technology to control Northern, Western and Mexican Corn Rootworm
- Proprietary technology based on a modified Bacillus thuringiensis Cry3Aa
- Event MIR604WR shown to be highly efficacious against Corn Rootworm
- The trait, together with Cruiser® seed treatment for secondary soil insects, provides broad spectrum economic control and yield preservation

CRW Control

CRW Control

Severe CRW Pressure

Planted May 29, 2004
Important Notice:
These products are not currently registered for sale or use in the United States and are therefore not being offered for sale. This presentation does not constitute an offer for sale. These products will not be available for sale until the EPA has approved registration and all necessary authorizations have been granted.