AGRONOMICS IS THE FOUNDATION FOR WEED MANAGEMENT

- Crop Rotations
- Weed Mix
- Weed Resistance
- Competition – Critical Times
- Genetics
- Costs

Weed Competition

- Space
- Nutrients
- Water

When Do I Need Weed Control?

- UNL Report – NCWSS
  2 %/leaf stage
  Yield Loss After Critical Period*
- 1999 Research
  >3” Weeds in Corn to Reach Minimal (5%)
  Yield Losses
  Specie, Density, Environment
  Grasses: 2-5” range
  Broadleaves: 3-10” range

Weed Competition Risk

Long Residual 3-4 wk
Pre emerge Treatment
Short Residual 1-2 wk
Early Post Treatment
Non Residual
Mid Post Treatment

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Yield Potential – Total Post

- Bicep II: 176
- Accent: 169
- Accent: 148
- Accent: 128
- Accent: 133

Pigweed Identification
Leaf tips are blunt or notched on all pigweds

- Smooth/Redroot
  - Rough texture
  - Hairy leaf, stem
  - Slow growth
  - 1 day

- Waterhemp
  - Waxy, hairless
  - Short petiole
  - Taller, fast
  - Growth 2-3’/day

- Palmer Amaranth
  - Waxy, hairless
  - Long petiole
  - Leaf Taller, fast
  - Growth 3-5’/day

Pigweed Management
- Germinate April – July
  - Need long residual or multiple treatments
- Resistance is common in Nebraska
  - Multiple Modes of Action, Timings
- Application Timing
  - Fast Growth = Narrow Window

Resistance Management
- Triazine: pigweeds, lambsquarters, kochia, ragweeds...
- Dicamba: kochia
- 2,4-D: kochia, pigweeds, thistle, ...
- ALS/AHAS: pigweeds, kochia, sunflowers, cocklebur,
  shattercane, ...
- Glyphosates: Italian & rigid ryegrass, goosegrass,
  marestail/horseweed, waterhemp (FT)
- Acetamides: Italian ryegrass (metab.)
- ETC.....

Bottom Line: If You Overuse & Abuse, You Will Lose

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Resistance Management
- Use Multiple Herbicide Mode of Actions
- Use Multiple Herbicide Timings
- Prevent Weeds from Flowering/Seeds
- Use Cultural Controls – Tillage, Rotations, ...
- Break Up Patterns – Prevention vs. Curative

Kochia Management
- Control Early
- Multiple MOAs
- Resistance
- Pre + Post
- Use Residual
- Prevent Seed Production
- Fallow Management

Diseases and Insect Pests of Corn and Soybean: When do they come together?

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The Soybean Aphid *Aphis glycines*

- Viruses Transmitted
  - Soybean Mosaic Virus
  - Alfalfa Mosaic Virus
  - Clover Yellow Mosaic Virus
  - Soybean Dwarf Virus

**Solutions**

- Consider seed treatment fungicides for soybeans
- Use resistant varieties and hybrids
- Stay up to date with insect pest populations

**Factors Favoring Seedling Disease**

- Wet conditions at planting
- Cool temperatures
- Poorly drained soils
- Conservation tillage
- Some herbicide interactions

**Planting Opportunities, Challenges, and Mistakes**

- You get what you plant
- Plant right the first time
- Stands don’t improve after planting
- Precise planting pays

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Planting Equipment Must:

- Cut or handle residue
- Penetrate the soil to desired seeding depth
- Establish seed-to-soil contact
- Close the seed-vee

What spacing variability do you see in your fields? ...in your neighbor's?

1. What factors influence spacing variability?
   - Soil
   - Seed
   - Planter
   - Operator

2. Is corn spacing uniformity important?
   - KSU
     - 0.8 bu/acre
   - Purdue Study (IN and OH)
     - 2.5 bu/acre
   - Standard deviation...a measure of spread or variation
3. Does Planting Speed Affect Spacing Variability and Yield?

Purdue study
- Effect on plant spacing
  - seven sites
  - two sites
  - 13 sites
- Effect on corn yield
  - five sites
  - 17 sites

Quad County Planter speed study: York, Fillmore, Clay and Hamilton Counties – 2001
- 15 Farmer Cooperators and Extension Educators
- 2, 4, 6 mph

Measures of plant spacing uniformity:
- Standard deviation
- D = Doubles
- M = Missing plants or skips
- A = Quality of feed index
- C = Precision (Variation in target area)
### Standard deviations - Quad Co. 2001

<table>
<thead>
<tr>
<th>Location</th>
<th>Plant Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>Location</td>
<td>4.5</td>
</tr>
</tbody>
</table>

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### 3. Does Planting Speed Affect Spacing Variability and Yield?

**Plant Spacing - 2 mph**  
13 locations

<table>
<thead>
<tr>
<th>Plant Spacing (inches)</th>
<th>Percent of sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td>14</td>
<td>70</td>
</tr>
<tr>
<td>16</td>
<td>80</td>
</tr>
<tr>
<td>18</td>
<td>90</td>
</tr>
<tr>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

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### 3. Does Planting Speed Affect Spacing Variability?

15 Location averages

<table>
<thead>
<tr>
<th>Speed</th>
<th>D %</th>
<th>M %</th>
<th>A %</th>
<th>C %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4.9</td>
<td>10.7</td>
<td>84.4</td>
<td>18.7</td>
</tr>
<tr>
<td>4</td>
<td>5.0</td>
<td>10.5</td>
<td>84.5</td>
<td>20.1</td>
</tr>
<tr>
<td>6</td>
<td>7.6</td>
<td>12.6</td>
<td>79.8</td>
<td>23.1</td>
</tr>
</tbody>
</table>

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### 2001 Corn Yield at 3 Planter Speeds – 15 NE Location Average

<table>
<thead>
<tr>
<th>Yield (bu/acre)</th>
<th>2 mph</th>
<th>4 mph</th>
<th>6 mph</th>
</tr>
</thead>
<tbody>
<tr>
<td>207</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>206</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>206</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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4. How can you Estimate Plant Spacing Accuracy?

- Measure plant spaces (250 plants/treatment)
- Plot data on charts
- See: *Crop Watch*, 17 May 2002

Some seed traits are easy to detect

- Seed size
- Seed color

Risk Management and New Technologies
Seed Composition Determines End-use Value

Altered Carbohydrate Pathways
- Amylose starch
- Waxy starch
- Glucose
- Sucrose
- Raffinose

Altered Pathways Determine Seed Traits
- Saturated (less healthy)
- Unsaturated (healthy oleic acid)

Genetic Engineering creates new traits with new markets
- Unsaturated (healthy oleic acid)
- Gamma Linoleic (Omega - 3)
- Stearidonic (Neutriceutical)

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### NE Farm Bus. Assoc. Data
#### Net Farm Income Variability

<table>
<thead>
<tr>
<th>Year</th>
<th>Low Profit 1/3</th>
<th>Average</th>
<th>High Profit 1/3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>$1,585</td>
<td>$68,657</td>
<td>$163,194</td>
</tr>
<tr>
<td>1997</td>
<td>-$15,992</td>
<td>$45,631</td>
<td>$115,907</td>
</tr>
<tr>
<td>1998</td>
<td>-$60,805</td>
<td>$4,746</td>
<td>$68,869</td>
</tr>
<tr>
<td>1999</td>
<td>-$11,477</td>
<td>$46,996</td>
<td>$113,464</td>
</tr>
<tr>
<td>2000</td>
<td>-$6,172</td>
<td>$48,279</td>
<td>$107,856</td>
</tr>
<tr>
<td>2001</td>
<td>-$11,625</td>
<td>$41,435</td>
<td>$97,576</td>
</tr>
</tbody>
</table>

### Seed Corn Production Avg. Data
#### 2001 NE Farm Bus. Association

<table>
<thead>
<tr>
<th>Crop</th>
<th>Seed Corn</th>
<th>Irr. Corn</th>
<th>Irr. Beans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross</td>
<td>$551</td>
<td>$335</td>
<td>$245</td>
</tr>
<tr>
<td>Expense</td>
<td>$434</td>
<td>$410</td>
<td>$316</td>
</tr>
<tr>
<td>Net*</td>
<td>$117</td>
<td>-$75</td>
<td>-$71</td>
</tr>
<tr>
<td>Year 2000 Net*</td>
<td>$90</td>
<td>-$90</td>
<td>-$63</td>
</tr>
</tbody>
</table>

*Net=Prior to Farm Program Payments

### Irr. Corn-17 Yr Avg.(1985-2001)
#### NE Farm Business Assoc. Data

<table>
<thead>
<tr>
<th>Category</th>
<th>All Farms</th>
<th>Hi Profit 1/3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>151 Bu</td>
<td>161 Bu</td>
</tr>
<tr>
<td>Marketing</td>
<td>$2.50</td>
<td>$2.51</td>
</tr>
<tr>
<td>Cost Control</td>
<td>$56.74</td>
<td>$51.59</td>
</tr>
<tr>
<td>P&amp;M Cost</td>
<td>$37.54</td>
<td>$35.39</td>
</tr>
</tbody>
</table>

### The Cost Savers-2000
#### NE Farm Bus. Assoc. Data

<table>
<thead>
<tr>
<th>Category</th>
<th>Avg.</th>
<th>Top 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>P&amp;M Invest/AC</td>
<td>$223</td>
<td>$139</td>
</tr>
<tr>
<td>P&amp;M Cost/AC</td>
<td>$66</td>
<td>$46</td>
</tr>
<tr>
<td>Expense Ratio</td>
<td>70.1%</td>
<td>58.8%</td>
</tr>
<tr>
<td>Net Farm Ratio</td>
<td>13.8%</td>
<td>26.9%</td>
</tr>
<tr>
<td>Family Living</td>
<td>$38,377</td>
<td>$33,310</td>
</tr>
<tr>
<td>Debt To Asset</td>
<td>38%</td>
<td>18%</td>
</tr>
</tbody>
</table>
### I.P. Grain Contract Considerations

1. Total Revenue
2. Additional Cost
3. Added Risk
4. Additional Management & Labor

### Production/Price Relationship

<table>
<thead>
<tr>
<th></th>
<th>Hi Protein Soybeans</th>
<th>Standard Soybean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>42 Bu</td>
<td>50 Bu</td>
</tr>
<tr>
<td>Price</td>
<td>$6.20</td>
<td>$5.00</td>
</tr>
<tr>
<td>Gross</td>
<td>$260.40</td>
<td>$250.00</td>
</tr>
<tr>
<td>Added Revenue</td>
<td>$10.40</td>
<td></td>
</tr>
</tbody>
</table>

Breakeven Price Incentive Required:

\[
\frac{250}{42} - \frac{5.00}{42} = 0.95
\]

### Added Costs?

- **Capital Investment:**
  - Mach/Equip
  - Storage/Drying

- **Operating Costs:**
  - Seed Cost
  - Chemical
  - Tillage
  - Hired Labor

### Additional Cost Example: Hi Protein Soybeans

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>Hi Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Cost</td>
<td>$140</td>
<td>$150</td>
</tr>
<tr>
<td>Bldg&amp;Mach Depr</td>
<td>$30</td>
<td>$45</td>
</tr>
<tr>
<td>ITL Interest</td>
<td>$10</td>
<td>$20</td>
</tr>
<tr>
<td>Land Charge</td>
<td>$105</td>
<td>$105</td>
</tr>
<tr>
<td>Total</td>
<td>$285</td>
<td>$320</td>
</tr>
<tr>
<td>Yield</td>
<td>50 Bu</td>
<td>42 Bu</td>
</tr>
<tr>
<td>Cost/Bu</td>
<td>$5.70</td>
<td>$7.62</td>
</tr>
</tbody>
</table>

Price Incentive Required: $1.92

---

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Increased Risk?

- Yield Variability
- Price Stability
- CRC Insurance
- Size & Duration of Contract
- Coordination with Fed. Farm Program
- Quality Control

Solutions

- Start with Good Records
- Know your costs
- Evaluate Genetic Potential
- Examine Contract Terms
- Consider Risk/ Reward Relationship

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