Drought Stressed Corn
Timing is Everything

R.W. Heiniger
Vernon G. James Center
North Carolina State University
Maximum Corn Yields are Obtained: when the corn plant collects the maximum amount of light possible without heat or drought stress.

The earlier or later the stress occurs the lower the impact on yield.

The shorter the period over which stress occurs the lower the impact on yield.
Yield Decline Resulting From Length of Time and Amount of Leaf Loss

Corn Defoliation Progress Curve

Relative Yield

- Camden - 2007
- Hyde - 2009

Camden - $y = 99.99 - 0.0004x$  \( R^2 = 0.78 \)

Hyde - $y = 99.63 - 0.001x$  \( R^2 = 0.88 \)
Fig. 4-1. Amount of water used per day by a growing corn crop planted on April 1 at a plant population of 30,000 plants per acre.
V8 – Eight Leaf Stage
Corn Yield Loss is a Function of the Amount of Leaf Area Lost From Rolling or Desiccation
Leaf Loss Resulting From Sun Scald
VT – Tassel
Corn Yield Loss is a Function of Each Day of Lost Photosynthesis – Lower Kernel Number
Reduction in Ear Size – Drought From V8 to VT
From VT to R2 Corn Yield Loss is a Function of the Number of Kernels aborted
Effect of Pollination Timing on Kernel Set

*Silks exposed to pollen daily

Ear Weight and Kernel Count of Ears Exposed to Pollen for One Day

Field is 50% silk on Day 4
Effect of Stress on Plant Growth and Development
Ear Size, Growth Stage, and Damage Intensity

V3

V10

VT

R1

0% 25% 50% 100%

0% 25% 50% 100%
Effect of Timing of Stress on Grain Yield and Test Weight

Yield and Test Weight; 100% Damage

- Yield
- Test Weight

Growth Stage at Damage

V3 V5 V7 V10 VT R1 R2 R4 Check (0%)

Yield (bu/a)

Test Weight (lb/bu)

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### Corn Row Spacing – 2009

<table>
<thead>
<tr>
<th>Row Spacing</th>
<th>Plant Spacing</th>
<th>Number of Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 inch</td>
<td>6 inch</td>
<td>78,400</td>
</tr>
<tr>
<td>8 inch</td>
<td>12 inch</td>
<td>39,200</td>
</tr>
<tr>
<td>20 inch</td>
<td>12 inch</td>
<td>26,100</td>
</tr>
<tr>
<td>30 inch</td>
<td>20 inch</td>
<td>26,100</td>
</tr>
<tr>
<td>36 inch</td>
<td>30 inch</td>
<td>17,400</td>
</tr>
</tbody>
</table>

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DKC68–05 Populations – 2010
Lesson #1: When the Chips are Down
Good Hybrid Selection is Your Salvation

- Stress and Heat Tolerant Hybrids Produced Superior Yield in 2010.

DKC 68-05 at 6” spacing

DKC 69-71 at 6” spacing

34,000 plants per acre
Corn Yield Response to Limited Irrigation

- \(\text{irrigated}\)
- \(\text{no irrigation}\)

Corn Yield (bu/acre)

Seeding Rate, seeds/acre x 1000

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The Value of a Timely Rainfall

Yield Gain From Single Rainfall in Late June 2009

\[ \text{x price of Corn } \$4.50 \text{ per bushel} \]

\[ \sim 25 \text{ bu / acre} \]

\[ \$112.50 / \text{acre} \]

If only 1/10 of the state received that timely moisture

\[ 90,000 \text{ acres } \times \$487.50 = \]

\[ \$ 10,125,000 \]

A single timely rainfall that covers Beaufort County (46,000 acres) only needs to result in a yield increase of 3.6 Bushels to be worth $1,000,000. – Less than one additional kernel per ear

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Questions