Irrigating to Roots

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Understanding the Root System
Cotton Root System

- Cotton roots have a relatively simple structure.
- The root grows from the tip by adding cells.
- Lateral roots develop behind the root tip.
- Must have moisture and oxygen in the root zone for a healthy root system to develop.
The cotton plant can be compared to a soda straw when considering water uptake. Water is taken in by the root system and is released or evaporates through openings in the leaves called stomates. Nutrients dissolved in the soil water will also be passively carried into the plant through the root system.
Cotton roots extend into the soil two to three times the above ground height of the plant.

Rooting depth is dependent on the amount of moisture and oxygen in the soil profile.

Roots DO NOT grow through dry soil to get to moisture.

So, root health, depth, and mass is largely determined how early season irrigation practices are managed.
Hand probing is an excellent way to determine the depth of moisture in the soil profile as well as the amount of moisture present.
Water Penetration, Movement in the Soil Profile and Evaporative Loss
BROADCAST SPRAY VERSUS LEPA

Broadcast Spray

LEPA
PROPER LEPA IRRIGATION DELIVERS WATER TO THE ROOTS
Root Orientation With LEPA Irrigation
LEPA OPTIONS
2022 DRIP IRRIGATION – WATER TO THE ROOTS?

Surface water from drip
WATER TO THE ROOTS
AN EXAMPLE

80” ROW SPACING
2022 IN PERSPECTIVE
HYPOTHETICAL COMPARISON OF EVAPOTRANSPIRATION 2022 VERSUS "NORMAL" YEAR

<table>
<thead>
<tr>
<th>Days After Planting</th>
<th>Inches Per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>emergence</td>
<td></td>
</tr>
<tr>
<td>first square</td>
<td></td>
</tr>
<tr>
<td>first bloom</td>
<td></td>
</tr>
<tr>
<td>first open boll</td>
<td></td>
</tr>
<tr>
<td>maturity</td>
<td></td>
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</tbody>
</table>
Maximizing the Water You Have

1” @ 50% = 0.5”
1” @ 80% = 0.8”

12” @ 50% = 6”
12” @ 80% = 9.6” applied

= 3.6” difference

3.6” x 80 pounds = 288 pounds of lint per acre.
GOOD DROUGHT MANAGEMENT – COMMON DENOMINATORS

- Planted no more acreage than they could water to begin with.
- There were no failed acres because of lack of water.
- All were on LEPA irrigation systems.
- Applied a pre-plant irrigation to a depth of 18 inches in the soil profile.
- Close adherence to irrigating to insure water reached the root system.
QUESTIONS?