PLANT GROWTH REGULATORS IN MELONS

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PLANT GROWTH REGULATORS IN THE LOW DESERT IS LIKE THE TALE OF TWO CITIES

- IT IS THE BEST OF TIMES IN ARIZONA AS PRODUCTS ARE REGISTERED FOR USAGE
- IT IS THE WORST OF TIMES IN CALIFORNIA BECAUSE NOT MUCH IS REGISTERED
PLANT GROWTH REGULATORS ON MELONS

- PRODUCTS THAT ARE REGISTERED:
  - AUXIGRO
  - MESSENGER
  - PROGIBB (4% & PLUS 2X)
  - TRIGGRR (SOIL & FOLIAR FORMULATIONS)
LET’S TAKE A LOOK AT THE CURRENTLY REGISTERED PRODUCTS

• TWO HORMONES AS ACTIVE INGREDIENTS

• Gibberelic Acid = ProGibb 4%, ProGibb Plus 2x

• Cytokinin = Soil Triggrrr, Foliar Triggrrr
  (also in a number of other products)
LET’S TAKE A LOOK AT THE CURRENTLY REGISTERED PRODUCTS (continued)

- TWO PRODUCTS THAT ARE NOT HORMONALLY BASED:
  - MESSENGER (Active ingredient = Harpin Protein)
  - AUXIGRO (Active ingredient = Glutamic Acid)
ProGibb 4%, ProGibb Plus 2x

- USED TO STIMULATE FRUIT SET DURING PERIODS OF COOL TEMPERATURE (*vines must be in good condition*)
- TIMINGS: ONE APPLICATION PRIOR TO BLOOM FOLLOWED BY 2 ADDITIONAL APPLICATIONS AT INTERVALS OF 10-14 DAYS ON CANTALOUPES AND WATERMELONS
- NOT FOR USE IN CALIFORNIA
- EFFECTIVE? NO LOW DESERT TRIALS COMPLETED BY UNIVERSITY RESEARCHERS IN THE PAST 15 YEARS BASED ON UA VEGETABLE REPORTS
CYTOKININ BASED PRODUCTS:  
SOIL APPLICATIONS

- USED TO IMPROVE EARLY SEEDLING VIGOR, IMPROVE ROOT GROWTH, STRESS RESISTANCE, AND INCREASED CROP UNIFORMITY

- TIMINGS: ONE APPLICATION PRE-PLANT OR 1\textsuperscript{ST} FERTILIZATION AFTER EMERGENCE; 2\textsuperscript{ND} APPLICATION BEFORE LAYBY OR WHEN PLANT BEGINS TO RUN
CYTOKININ BASED PRODUCTS: FOLIAR APPLICATIONS

- USED TO IMPROVE FLOWERING AND FRUIT SET, CROP UNIFORMITY AND SIZE
- ALSO TO INCREASE FRUIT RETENTION AND STIMULATE BLOOM IN WATERMELONS AND MUSKMELONS

**TIMINGS –**
- CANTALOUPES AND HONEYDEWS:
  - 2 APPLICATIONS;
  - 1st @ 1st OPEN FEMALE FLOWER,
  - 2nd APPLICATION WHEN FIRST FRUIT IS 1 INCH IN DIAMETER
CYTOKININ BASED PRODUCTS: FOLIAR APPLICATIONS

• **TIMINGS** –
• WATERMELONS AND MUSKMELONS:
  • 2-3 APPLICATIONS
  • 1\(^{ST}\) WHEN FIRST FRUIT IS 2 INCHES IN DIAMETER
  • 2\(^{ND}\) & 3\(^{RD}\) AFTER HARVEST TO STIMULATE CONTINUED BLOOM
CYTOKININ BASED PRODUCTS

- NOT FOR USE IN CALIFORNIA
- EFFECTIVE?? NO LOW DESERT TRIALS COMPLETED BY UNIVERSITY RESEARCHERS IN THE PAST 15 YEARS BASED ON UA VEGETABLE REPORTS
MESSENGER

• HARPIN PROTEIN (NOT A HORMONAL BASED PRODUCT)

• PURPOSE: TO BOOST OVERALL PRODUCTION AND AID IN THE MANAGEMENT OF DISEASE SUCH AS CUCUMBER MOSAIC VIRUS AND TOBACCO MOSAIC VIRUS

• APPLICATION TIMINGS: AS FOLIAR SPRAY BEGINNING AT FIRST TRUE LEAF AND REPEATED AT APPROXIMATELY 14 DAY INTERVALS

• NOT FOR USE IN CALIFORNIA
MESSENGER

- SOME FIELD TRIALS IN THE LOW DESERT COMPLETED BY BOTH UCCE & UA COOPERATIVE EXTENSION (ACE)

- UMEDA – BOTH WATERMELONS AND CANTALOUPES: BI-WEEKLY VS. 3 TIMELY APPLICATIONS (EARLY RUNNER, BLOOM, AND FRUITING)

- ZERKOUNE – CANTALOUPES: COMPARISON OF 4 BI-WEEKLY APPLICATIONS VS. SINGLE APPLICATION AT 3 LEAF STAGE
UMEDA

CANTALOUPE RESULTS:
NO DIFFERENCES IN VINE GROWTH, NUMBER OF FRUIT SET, YIELD WEIGHT, OR FRUIT SIZES.

WATERMELON RESULTS:
THREE TIMELY APPLICATIONS TENDED TO RESULT IN SLIGHTLY MORE VIGOROUS PLANTS AT END OF SEASON THAN BI-WEEKLY APPLICATIONS (NO STATISTICAL DIFFERENCES FOR THIS OR VINE LENGTH, NUMBER OF BLOOMS, OR HARVESTABLE YIELDS)
**ZERKOUNE RESULTS FROM CANTALOUPE**

- VARIABLE RESULTS, NO SIGNIFICANT EFFECT OF MESSENGER ON PLANT GROWTH AND YIELD
- INDICATION THAT WHEN APPLIED AT 3 LEAF STAGE MESSENGER INDUCED SIGNIFICANTLY EARLIER MELON FORMATION (0.96 VS. 0.6/VINE @ 27 DAT), AND INCREASED NODES (20 vs. 18.6)
WHAT ABOUT MIXED MELONS?

• FIELD WITH 5 TYPES OF MELONS
  (Honeydew, Crenshaw, Santa Claus, Persian, Casaba)

• 3 REPLICATIONS FOR EACH TYPE OF MELON (4 for Honeydew)

• FIRST APPLICATION AT ~3 LEAF STAGE (March 28, 2003, Blythe, CA)

• APPROXIMATELY 2.5 WEEK INTERVAL (March 28, Apr. 11, May 2, 21)

• 4 APPLICATIONS TOTAL
NUMBER OF MARKETABLE MELONS PER ACRE

- **CASABA**
- **CRENSHAW**
- **HONEYDEW**
- **PERSIAN**
- **SANTA CLAUS**

**MELON TYPE**

**MESSENGER**

**UNTREATED**
BRIX IN MELONS ON JUNE 6, 2002

- **Melon Types**: Casaba, Crenshaw, Honeydew, Persian, Santa Claus
- **BRIX Levels**: MESSENGER (light blue) and UNTREATED (dark red)

*Note: Graph showing BRIX levels for different melon types on June 6, 2002.*
MESSENGER EFFECTS

• EARLY APPLICATION DEFINITELY HELPED MELONS IN WEAK AREAS OF FIELD (COOL, WET, DISEASE)

• SOME MELON TYPES WITH GREATLY INCREASED FOLIAGE AND COVER

• MELON YIELDS FROM INCREASED FOLIAGE NOT SIGNIFICANTLY DIFFERENT THAN CHECK, BUT NUMERICALLY LOWER THAN UNTREATED CHECK
MESSENGER EFFECTS (continued)

• LOWER YIELDS THOUGHT DUE TO DIFFICULTY WITH BEES POLLINATING FLOWERS (HIDDEN BY COPIOUS AMOUNTS OF FOLIAGE AND/OR BY WINDY SPRING DAYS IF FLOWERS PEAKING ON DIFFERENT DAYS DUE TO TREATMENT)

• CRENSHAW YIELDS WERE NUMERICALLY INCREASED BY USE OF MESSENGER, BUT PERSIAN YIELDS WERE SIGNIFICANTLY REDUCED

• GROWERS MAY NEED TO ONLY USE MESSENGER EARLY (3 LEAF STAGE)?
AUXIGRO

PURPOSE: TO INCREASE THE YIELD AND/OR QUALTITY

- **2 APPLICATIONS:**
  - **1\textsuperscript{ST}** = 4 OZ/ACRE @ EARLY BLOOM JUST PRIOR TO RUNNING
  - **2\textsuperscript{ND}** = 4 OZ/ACRE @ FEMALE FRUIT SET (TYPICALLY 14-21 DAYS AFTER 1\textsuperscript{ST} APPLICATION)
AUXIGRO (continued)

- CURRENTLY REGISTERED IN ARIZONA ON WATERMELONS ONLY
- HAS BEEN APPROVED IN CALIFORNIA BY DPR '(EMERALD BIOAGRICULTURE WAITING TO RECEIVE STAMPED LABEL)'
- NEW REGISTRATION (CALIFORNIA AND NATIONAL) WILL BE FOR ALL MELONS
### AuxiGro® Effect on Melons

<table>
<thead>
<tr>
<th>Cooperator</th>
<th>Location</th>
<th>Type</th>
<th>Variety</th>
<th>Control</th>
<th>AuxiGro</th>
<th>Difference</th>
<th>Control</th>
<th>AuxiGro</th>
<th>Difference</th>
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<tr>
<td>Star Ag Consult. 280/01/01-001-TX</td>
<td>Raymondville, TX</td>
<td>Watermelon</td>
<td>Watermelon Sumari</td>
<td>13.3</td>
<td>19.5 *</td>
<td>46.6%</td>
<td>54.3</td>
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<td>Watermelon</td>
<td>Watermelon Sumari</td>
<td>26.8</td>
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<td>Cantaloupes</td>
<td>Cantaloupes Oro Rico</td>
<td>172.0</td>
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<td>32.4%</td>
<td>363.8</td>
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<td>Cantaloupes</td>
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<td>Watermelon Fiesta</td>
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<td>Watermelon Fiesta (pollinator)</td>
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<td>67.5</td>
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<td>193.3</td>
<td>218.8</td>
<td>13.2%</td>
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**Average Increase**

- Total Yield Increase: **31.4 %**
- AuxiGro® Yield Increase: **38.7 %**
AUXIGRO TEST RESULTS FROM EMERALD BIOAGRICULTURE

• 4 OZ CONSISTENTLY BETTER THAN OTHER RATES, ALTHOUGH LINEAR RESPONSES SOMETIMES NOTED (8 OZ HAD MORE YIELD THAN 4 OZ, WHICH WAS HIGHER THAN 2 OZ)

• CALIFORNIA DATA FROM ESCALON (NORTH OF MODESTO, MAY HAVE HAD HIGHER DISEASE PRESSURES THAN IN LOW DESERT)
LOW DESERT TEST RESULTS

• FALL 2003 – HONEYDEW MELONS
• TWO HIGH RATES (16 AND 32 OZ/ACRE) IN SINGLE APPLICATION MADE WHEN FEMALE FLOWERS FIRST REACHED 10% ON RUNNERS
• NO DIFFERENCES IN YIELD OR QUALITY NOTED FOR THIS TYPE OF MELON AT THESE HIGH RATES IN 2003