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 Triggrr, Foliar Triggrr
    (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 1ST FERTILIZATION AFTER EMERGENCE; 2ND APPLICATION BEFORE LAYBY OR WHEN PLANT BEGINS TO RUN

CYTOKININ BASED PRODUCTS: FOLIAR APPLICATIONS

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

- TIMINGS –
  - WATERMELONS AND MUSKMELONS:
    - 2-3 APPLICATIONS
    - 1ST WHEN FIRST FRUIT IS 2 INCHES IN DIAMETER
    - 2ND & 3RD AFTER HARVEST TO STIMULATE CONTINUED BLOOM

- 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: 6 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
MESSENGER (CONTINUED)

- 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).

MESSENGER (CONTINUED)

- ZERPON 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

MARKETABLE YIELDS PER ACRE

BRIX IN MELONS 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)?

MESSENGER EFFECTS (continued)

AUXIGRO

PURPOSE: TO INCREASE THE YIELD AND/OR QUALITY

• 2 APPLICATIONS:
  1ST = 4 OZ/ACRE @ EARLY BLOOM JUST PRIOR TO RUNNING
  2ND = 4 OZ/ACRE @ FEMALE FRUIT SET (TYPICALLY 14-21 DAYS AFTER 1ST 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 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