

# 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
- Gibberellic 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 CANTALOUPE 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<sup>ST</sup> FERTILIZATION AFTER EMERGENCE; 2<sup>ND</sup> 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 –
- CANTALOUPE AND HONEYDEWS:
  - 2 APPLICATIONS;
  - 1<sup>ST</sup> @ 1<sup>ST</sup> OPEN FEMALE FLOWER,
  - 2<sup>ND</sup> APPLICATION WHEN FIRST FRUIT IS 1 INCH IN DIAMETER

## CYTOKININ BASED PRODUCTS: FOLIAR APPLICATIONS

- TIMINGS –
- WATERMELONS AND MUSKMELONS:
  - 2-3 APPLICATIONS
  - 1<sup>ST</sup> WHEN FIRST FRUIT IS 2 INCHES IN DIAMETER
  - 2<sup>ND</sup> & 3<sup>RD</sup> 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 CANTALOUPE: 4<sup>TH</sup> WEEKLY VS. 3 TIMELY APPLICATIONS (EARLY RUNNER, BLOOM, AND FRUITING)
- ZERKOUNE – CANTALOUPE: COMPARISON OF 4<sup>TH</sup> 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)

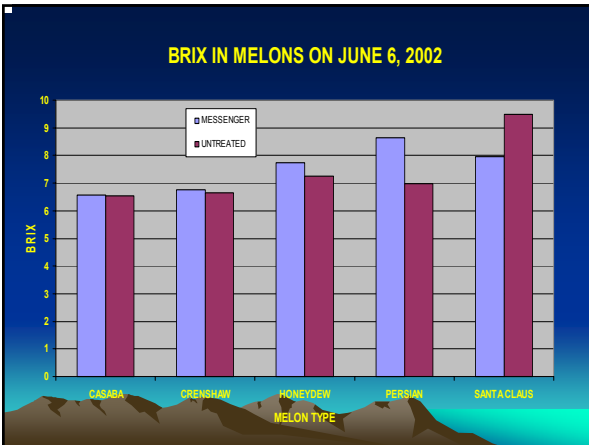
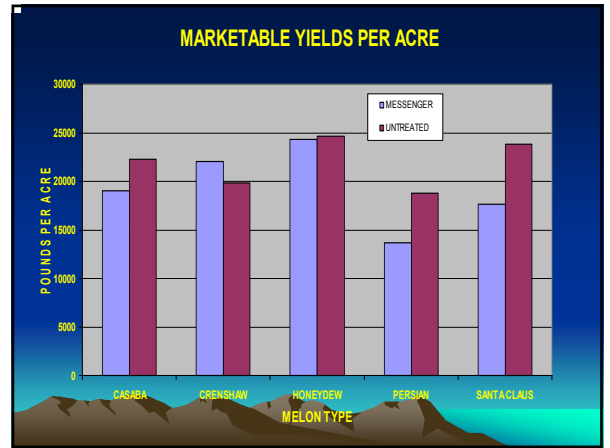
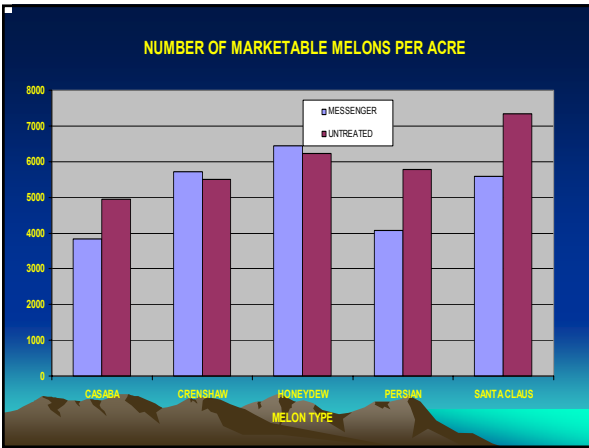
## MESSENGER (CONTINUED)

- 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





- ### 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 QUALITY
- 2 APPLICATIONS:
  - 1<sup>ST</sup> = 4 OZ/ACRE @ EARLY BLOOM JUST PRIOR TO RUNNING
  - 2<sup>ND</sup> = 4 OZ/ACRE @ FEMALE FRUIT SET (TYPICALLY 14-21 DAYS AFTER 1<sup>ST</sup> 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								
Cooperator	Type	Total Number of Melons <sup>#</sup>			Yield (lb./plot)			
Trial No.	Location	Variety	Control	AuxiGro	Difference	Control	AuxiGro	Difference
Star Ag Comille 280(01-01)-001- TX	Raymondville, TX	Watermelon	13.3	19.5 *	46.6%	54.3	84.8	56.1%
B. Bauer 280(01-01-001-01)	Escalon, CA	Watermelon Sumari	26.8	45.5 *	69.8%	300.6	460.0 *	53.0%
B. Bauer 280(01-01-001-02)	Escalon, CA	Cantaloupes Oro Rico	172.0	227.8 *	32.4%	363.8	501.0 *	37.7%
B. Bauer 280(01-01-001- E2)	Escalon, CA	Watermelon Sumari	14.5	18.5 *	27.6%	158.4	253.4	60.0%
B. Bauer 285(01-02-001-01)	Escalon, CA	Watermelon Sumari	41.8	47.0	12.4%	296.2	397.8 *	34.3%
B. Bauer 285(01-02-001-02)	Escalon, CA	Cantaloupes Oro Rico	159.0	194.5 *	22.3%	364.4	428.2 *	36.1%
B. Bauer 285(01-02-001- E2)	Escalon, CA	Watermelon Fiesta	13.5	19.0	40.7%	157.0	217.8	38.7%
B. Bauer 280(02-01-001-04)	Escalon, CA	Watermelon Syngenta 313	20.8	24.3	16.8%	333.0	392.3	17.8%
		Watermelon Fiesta (pollinator)	7.8	11.3 *	44.9%	153.0	228.5 *	49.3%
B. Bauer 260(02-01-001-06)	Escalon, CA	Orange Flesh Honeydew	58.5	67.5	15.4%	193.3	218.8	13.2%
AVERAGE INCREASE					31.4%			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