Marrone® Bio Innovations

BIO WITH BITE.®

STARGUS®
BIOFUNGICIDE

ENNOBLE™
BIOFUMIGANT

Dr. Melissa O'Neal
Manager of Western US Field Development and Technical Services
805-234-5723 / moneal@marronebio.com

Safe Harbor Statement

This presentation may include forward-looking statements. These statements reflect the current views of the Company's senior management with respect to future events and financial performance. These statements include forward-looking statements with respect to the Company's business and industry in general, including statements regarding potential market size of Company products, anticipated product development costs, target geographic markets, and future goals. Statements that include the words "expect," "intend," "plan," "believe," "project," "forecast," "estimate," "may," "should," "anticipate", "target", "goals" and similar statements of a future or forward-looking nature identify forward-looking statements for purposes of the federal securities laws or otherwise. Forward-looking statements address matters that involve risks and uncertainties, such as the timing of and costs associated with the launch of products, the difficulty in predicting the timing or outcome of product research and development efforts and regulatory approvals. Accordingly, there are or will be important factors that could cause the Company's actual results to differ materially from those indicated in these statements. The statements made herein speak only as of the date of this presentation.

OVERVIEW

- Biopesticides in General
- MBI Company Mission & History
- MBI Portfolio Offerings
- MBI Product Briefings
- Stargus & Ennoble
  - Product Information
  - Datasets

Biopesticides & Sustainable Agriculture

MBI Meets Demand

Biopesticides Meet the Challenges of Sustainable Agriculture

Biopesticides are solutions for sustainable & eco-friendly IPM & crop production programs, often enhancing yield & quality:

- Alternatives to neonicitinoids, OPs, pyrethroids
- Low risk to pollinators & other beneficials
- Can reduce resistance risk & enhance programs with single site chemicals where resistance to strobilurins, DMIs, diamides, & other chemical products exists
- Make organic programs more durable, lowering resistance risk due to overuse
- Potentially replace toxic fumigants

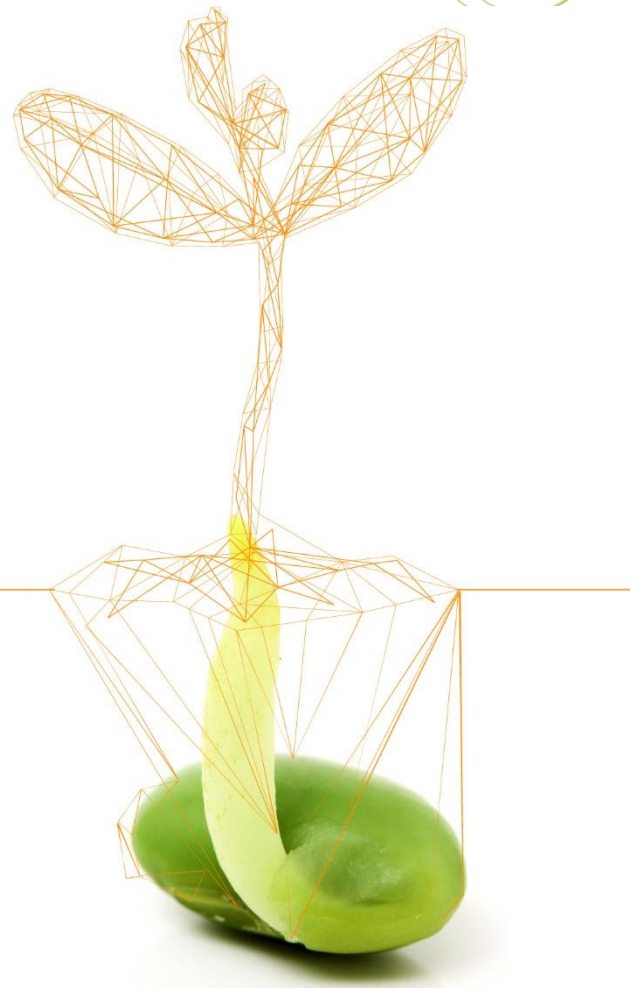
New IPM Programs are Needed

- Many existing IPM programs are outdated & do not reflect biopesticide products & modes of action available to today's growers
- Trials should be conducted as integrated programs rather than just stand alone to better reflect grower practices
- More work should be conducted integrating different classes of biopesticides & integrating biopesticides with synthetic chemicals

About the Company

Marrone Bio Innovations, Inc. strives to lead the movement to a more sustainable world through the discovery, development, & promotion of biological products for pest management & plant health.

Effective & environmentally responsible solutions help customers operate more sustainably.



Company Highlights

- *Incorporated June 2006*
- *7 commercially available MBI actives*
- *1 awaiting approval; 3 EPA registered*
- *~100 employees, 1/3 in R&D*
- *Library of 18,000+ proprietary microorganisms screened against multiple targets*
- *Wholly-owned fermentation facility in Bangor, MI*
- *Commercial sales in N. America, LATAM, Africa & Mideast*
- *Listed on NASDAQ as MBII in 2013*

MBI and Biopesticides

Marrone Bio Innovations has been at the forefront of finding and developing new crop protection solutions since 2006. We target solutions for every problem on the acre with both our current product portfolio and products in development.

Boost yield and quality

Manage resistance

Harvest flexibility

Worker-friendly

Product Portfolio

STARGUS® BIOFUNGICIDE

GRANDEVO® BIOINSECTICIDE WDG

MAJESTENE® BIONEMATICIDE

REGALIA® BIOFUNGICIDE

VENERATE® BIOINSECTICIDE XC

HAVEN® SUN PROTECTANT

ENNOBLE™ BIOFUMIGANT

MRL Exempt

0-Day PHI

Minimal PPE

4-Hour REI

Marrone® Bio Innovations

Family of OMRI Products

REGALIA® BIOFUNGICIDE

MAJESTENE® BIONEMATICIDE

STARGUS® BIOFUNGICIDE

OMRI LISTED For Organic Use

VENERATE® XC BIOINSECTICIDE

GRANDEVO® WDG BIOINSECTICIDE

ENNOBLE™ BIOFUMIGANT

Marrone® Bio Innovations

Marrone® Bio Innovations

BIO WITH BITE.®

REGALIA®

BIOFUNGICIDE

REGALIA® BIOFUNGICIDE Multiple novel modes of action, collectively referred to as Induced Systemic Resistance (ISR)

1

Inhibits pathogen growth

ISR triggers the creation of several antimicrobial compounds, phenolics, phytoalexins, & PR proteins that enable treated plants to inhibit & restrain pathogen growth

2

Strengthens cell walls

ISR signals the plant to accumulate more lignin, which thickens & strengthens cell walls.
This added strength helps protect against penetration by pathogens & lends structural integrity to the plant

3

Promotes plant growth

In addition to disease control, Regalia also enhances plant health by stimulating production of phytohormones & chlorophyll

GROUP P5 FUNGICIDE

Marrone® Bio Innovations

Marrone Bio Innovations

BIO WITH BITE.®

VENERATE® XC

BIOINSECTICIDE

Venerate® Bioinsecticide

- Liquid formulation containing 94.46% heat-killed *Burkholderia rinojensis* (strain A396) cells & spent fermentation media
- Targets: certain sucking & chewing insects & mites
- Also useful against certain soil pests
- 1-4 qt/Ac foliar, 2-4 qt/Ac in soil applications

VENERATE® XC Features Multiple Modes of Action

VENERATE® BIOINSECTICIDE XC

1 **Exoskeleton Degradation**

Active against adults & nymphs

2 **Molting Interference**

Exposed nymphs & immatures are unable to molt

3 **Ingestion**

Insects & mites are subject to control via ingestion

Marrone® Bio Innovations

BIO WITH BITE.®

GRANDEVO® WDG

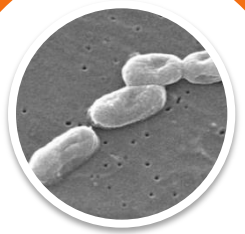
BIOINSECTICIDE

Grandevo Bioinsecticide

- Water dispersible granule containing 30% dead *Chromobacterium subtsugae* (strain PRAA4-1^{T}) cells & spent fermentation media
- 1-3 lbs./acre use rate

GRANDEVO®
BIOINSECTICIDE

GRANDEVO® WDG - General Overview



Naturally derived from *Chromobacterium subtsugae*

- Activity stems from the combination of multiple compounds produced by the bacteria
- Contains dead bacteria plus associated compounds produced in the cells
- Activity includes repellency, reduced fecundity, reduced egg hatch, & death via ingestion

Selective, broad spectrum protection

- Sucking & chewing insects
- Flies
- Mites

Easy on pollinators and beneficials

No effect on pollination & fruit set

Marrone Bio Innovations

Complex modes of action via multiple compounds

GRANDEVO® BIOINSECTICIDE WDG

1. Agitation/repellency
2. Gut disruption
3. Reduces egg laying, egg hatching, & fecundity
4. Stops feeding in seconds

Marrone® Bio Innovations

Mode of Action – Gut Disruption & Stops Feeding

Leaf-feeding Lepidoptera & select Chrysomelidae

Marrone Bio Innovations

BIO WITH BITE.®

HAVEN®

SUN PROTECTANT

HAVEN® SUN PROTECTANT

- Increases yield & quality of fruit, nut, & vegetable crops
- Contains 10% stearyl alcohol derived from coconut extract
- Rate: 0.6% v/v = roughly 5 pints
- Apply at full bloom to fruit/nut set
- Applications leave no visible residue/deposit

Target Crops

- Tree nuts
- Grapes
- Fruiting vegetables (pepper/tomato)
- Berries

Pome fruit
Citrus
Cucurbits

VS

Does not leave visible deposit or residue on the crop

Marrone® Bio Innovations

Marrone Bio Innovations

BIO WITH BITE.®

STARGUS®

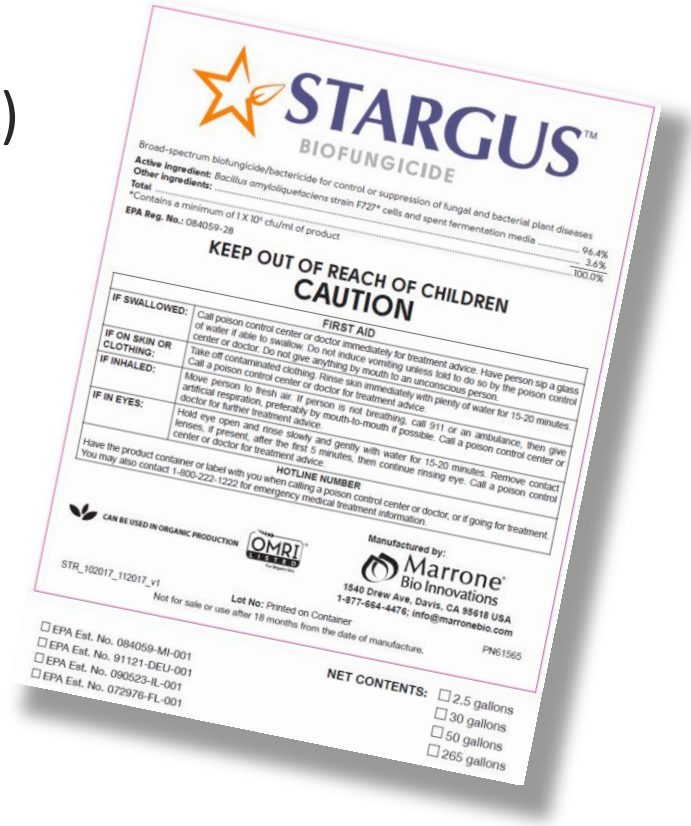
BIOFUNGICIDE

Bacillus amyloliquefaciens strain F727

California registration pending

STARGUS® Bio-fungicide. What is it?

- Liquid fungicide used at 1-4 qt/Acre
- Active ingredient: unique isolate of *Bacillus amyloliquefaciens* (strain F727)
- Broad spectrum biofungicide containing peptides produced during fermentation
- SAR activity & root colonization
- OMRI listed
- FRAC code pending


STARGUS™
BIOFUNGICIDE
Broad-spectrum biofungicide/bactericide for control or suppression of fungal and bacterial plant diseases
Active ingredient: Bacillus amyloliquefaciens strain F727* cells and spent fermentation media 96.4%
Other ingredients: 3.6%
Total 100.0%
*Contains a minimum of 1 X 10⁹ cfu/ml of product
EPA Reg. No.: 084059-28
KEEP OUT OF REACH OF CHILDREN
CAUTION
FIRST AID
IF SWALLOWED: Call poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.
IF ON SKIN OR CLOTHING: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
IF INHALED: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.
IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
HOTLINE NUMBER
Have the product container or label with you when calling a poison control center or doctor, or if going for treatment. You may also contact 1-800-222-1222 for emergency medical treatment information.
CAN BE USED IN ORGANIC PRODUCTION
OMRI LISTED
Manufactured by:
Marrone Bio Innovations
1540 Drew Ave, Davis, CA 95618 USA
1-877-664-4476; info@marronebio.com
STR_102017_112017_v1
Not for sale or use after 18 months from the date of manufacture.
Lot No: Printed on Container
PN61565
EPA Est. No. 084059-MI-001
EPA Est. No. 91121-DEU-001
EPA Est. No. 090523-IL-001
EPA Est. No. 072976-FL-001
NET CONTENTS: 2.5 gallons 30 gallons 50 gallons 265 gallons

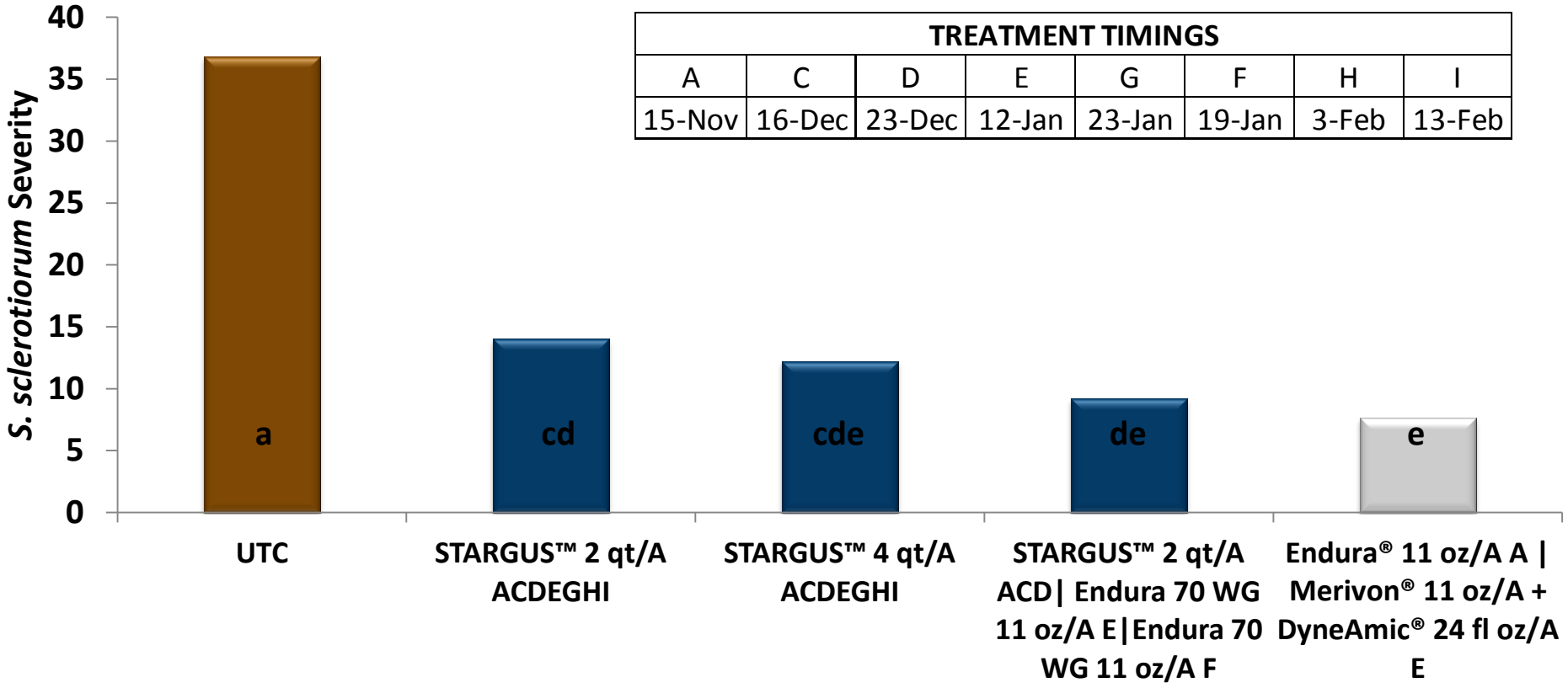
STARGUS® -Primary Labeled Crops & Diseases*

- **Bushberries & cranberries:** *Botrytis*, *Phomopsis*
- **Bulb vegetables**: *Botrytis*, *Peronospora*
- **Brassica leafy vegetables**: *Peronospora*
- **Cucurbits:** *Peronospora*, *Phytophthora*
- **Fruiting vegetables:** *Xanthomonas*, *Phytophthora*
- **Grapes**: *Botrytis*, *Peronospora*, *Guignardia*
- **Leafy vegetables:** *Sclerotinia* spp., *Peronospora*
- **Legumes:** *Sclerotinia* spp., *Peronospora*, *Xanthomonas*
- **Oilseed crops:** *Sclerotinia* spp., *Xanthomonas*
- **Root & tuber vegetables**: *Sclerotinia* spp., *Phytophthora*, *Botrytis*, *Xanthomonas*
- **Strawberry:** *Botrytis*

- **California registration is pending*

Stargus® on *Sclerotinia sclerotiorum* in Lettuce

Dr. Matheron, University of Arizona, Yuma, AZ.



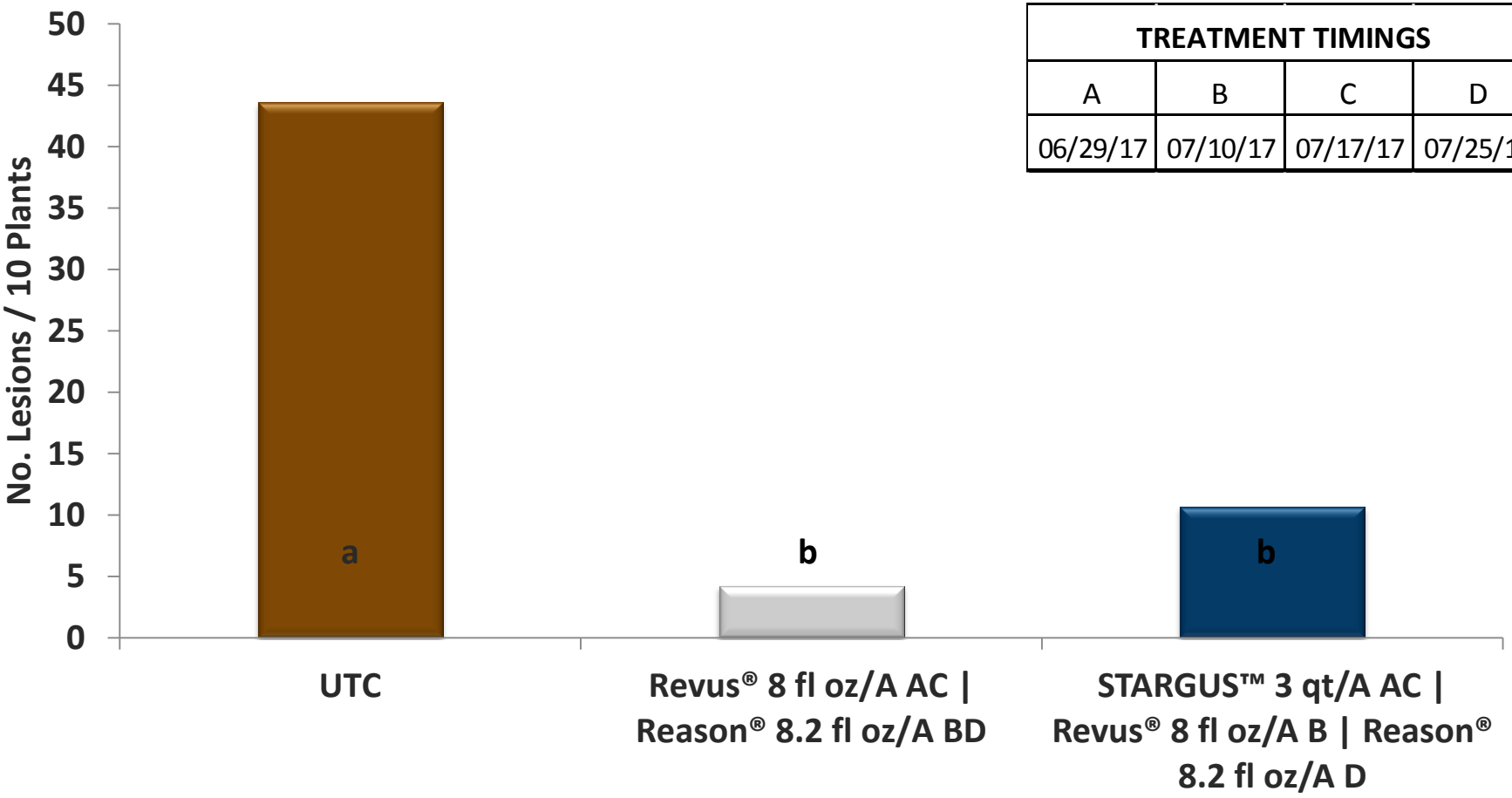
TREATMENT TIMINGS							
A	C	D	E	G	F	H	I
15-Nov	16-Dec	23-Dec	12-Jan	23-Jan	19-Jan	3-Feb	13-Feb

Marrone® Bio Innovations

Stargus® on Downy Mildew in Lettuce

Crop Science Services, Aromas, CA.

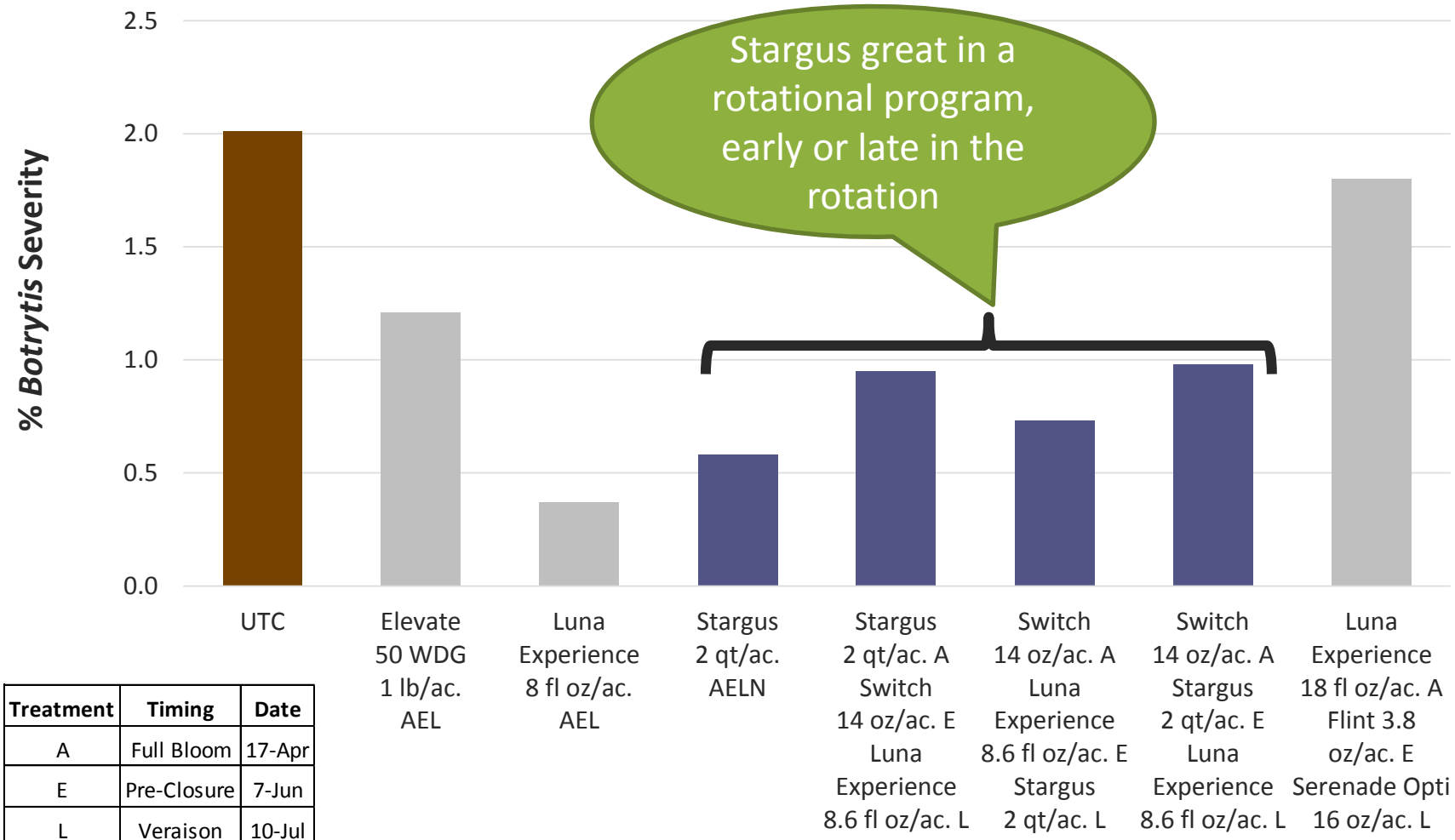
TREATMENT TIMINGS			
A	B	C	D
06/29/17	07/10/17	07/17/17	07/25/17



Marrone® Bio Innovations

Stargus® Against *Botrytis* on Grape

W.D. Gubler, UC Davis



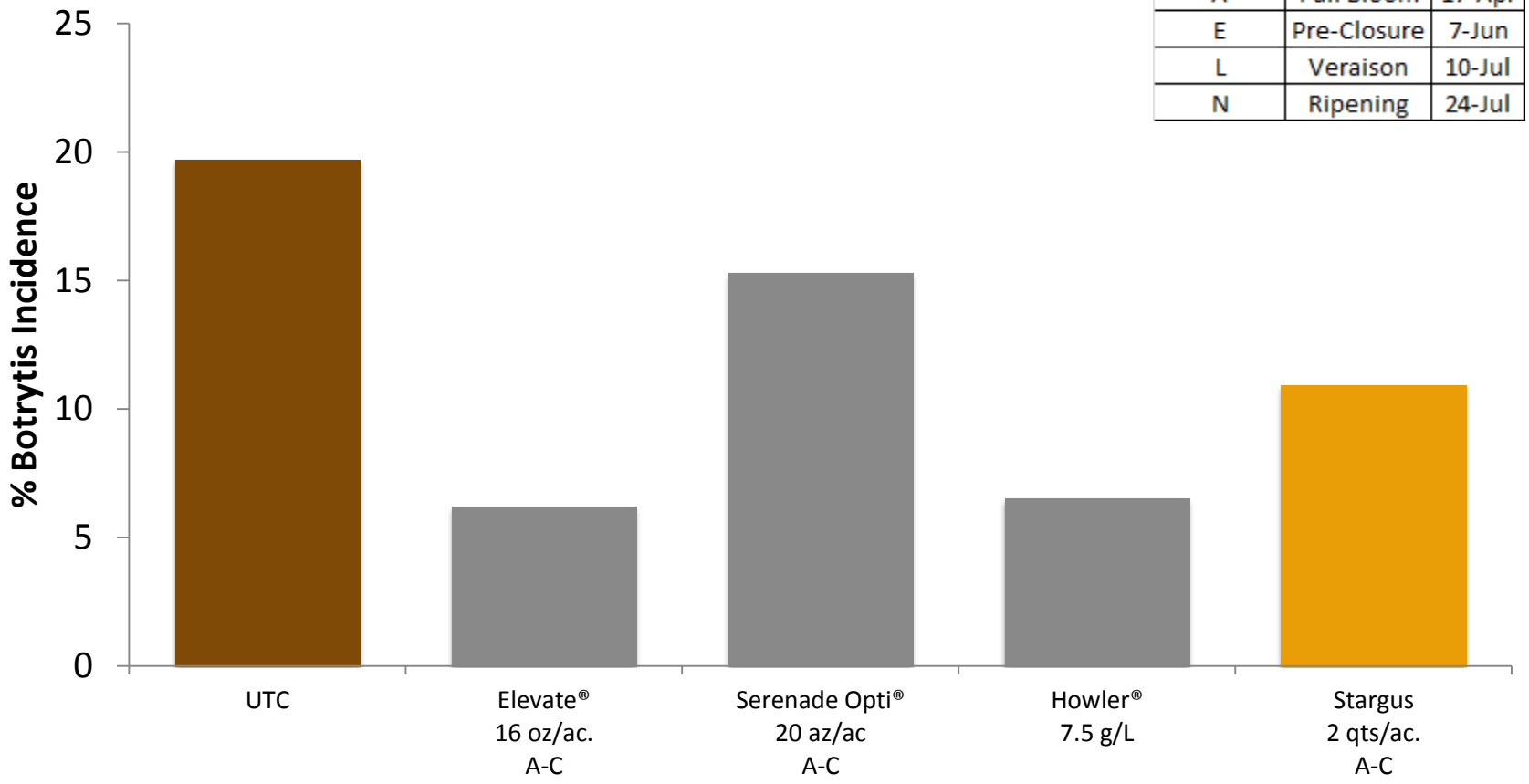
Treatment	Timing	Date
A	Full Bloom	17-Apr
E	Pre-Closure	7-Jun
L	Veraison	10-Jul
N	Ripening	24-Jul

Marrone Bio Innovations

Stargus® Against *Botrytis* on Grape

UCD, W.D. Gubler. Napa, CA.

Treatment	Timing	Date
A	Full Bloom	17-Apr
E	Pre-Closure	7-Jun
L	Veraison	10-Jul
N	Ripening	24-Jul



Elevate® is a registered trademark of Arysta LifeScience. Serenade Optimum ®is a registered trademark of Bayer CropScience. Howler® is a registered trademark of AgBiome.

ENNOBLE™
BIOFUMIGANT

Marrone® Bio Innovations

ENNOBLE™

Biofumigant

What is it?

- Granular biological soil treatment for control of nematodes & soil-borne diseases
- Active ingredient: *Muscodor albus* (strain SA 13)
- Broad-spectrum; active by releasing volatiles into soil rhizosphere
- OMRI listed
- FRAC code pending
- No affect on non-pathogenic soil microorganisms

ENNOBLE™

Primary Labeled* Crops & Diseases

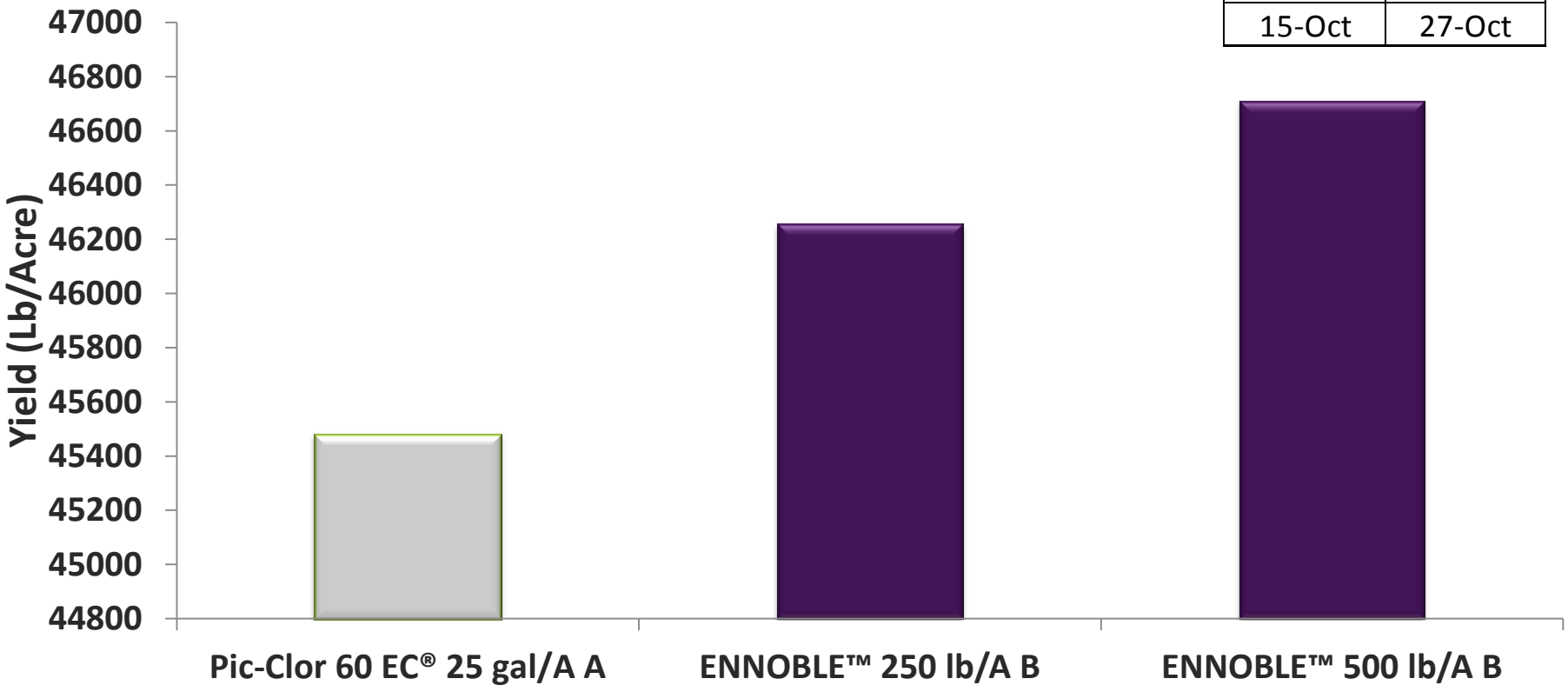
- **Strawberries:** *Macrophomina*
- **Leafy vegetables:** *Fusarium, Sclerotinia* spp., *Verticillium*
- **California registration is pending*

- Apply 5-7 days pre-plant

ENNOBLE™ on *Macrophomina / Verticillium* in Strawberry

Pacific Ag Research, San Luis Obispo, CA.

TREATMENT TIMINGS	
A	B
15-Oct	27-Oct

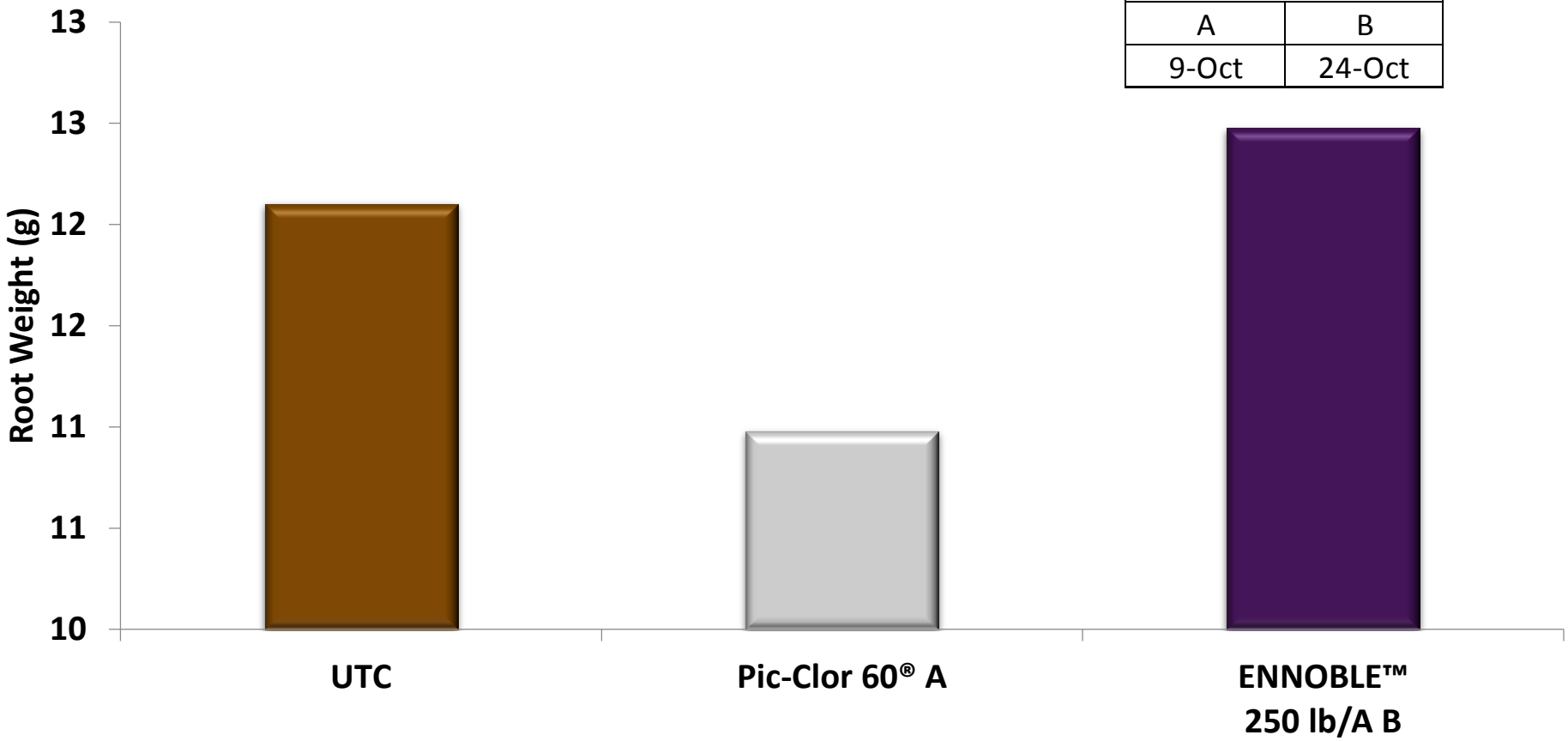


Marrone® Bio Innovations

ENNOBLE™ on *Rhizoctonia, Cylindrocarpon, & Pythium* in Strawberry

Plant Sciences, Inc., Watsonville, CA.

TREATMENT TIMINGS	
A	B
9-Oct	24-Oct

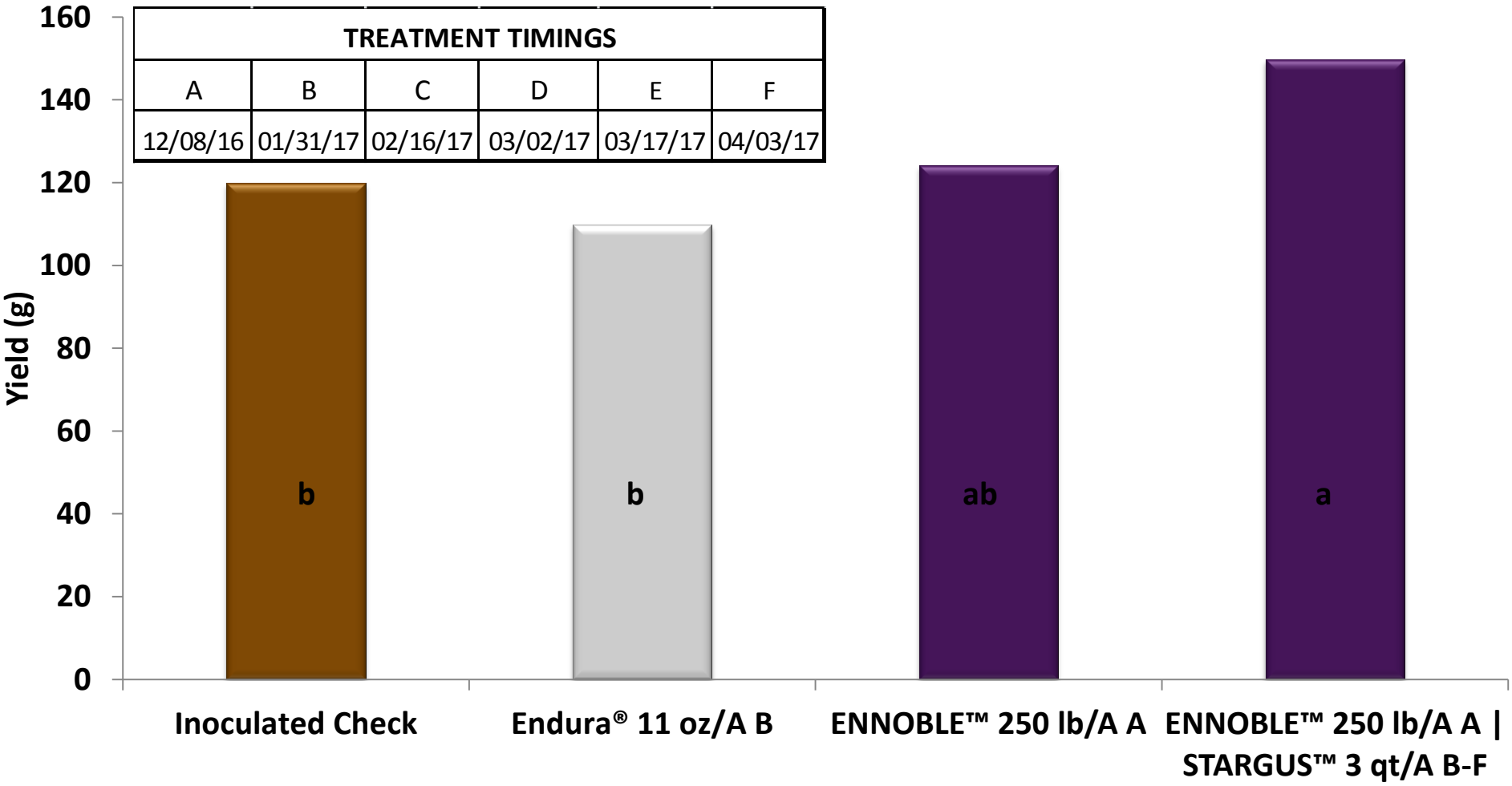


Marrone® Bio Innovations

ENNOBLE™ & STARGUS® on *Sclerotinia minor* in Lettuce

Research Designed for Agriculture, Yuma, AZ

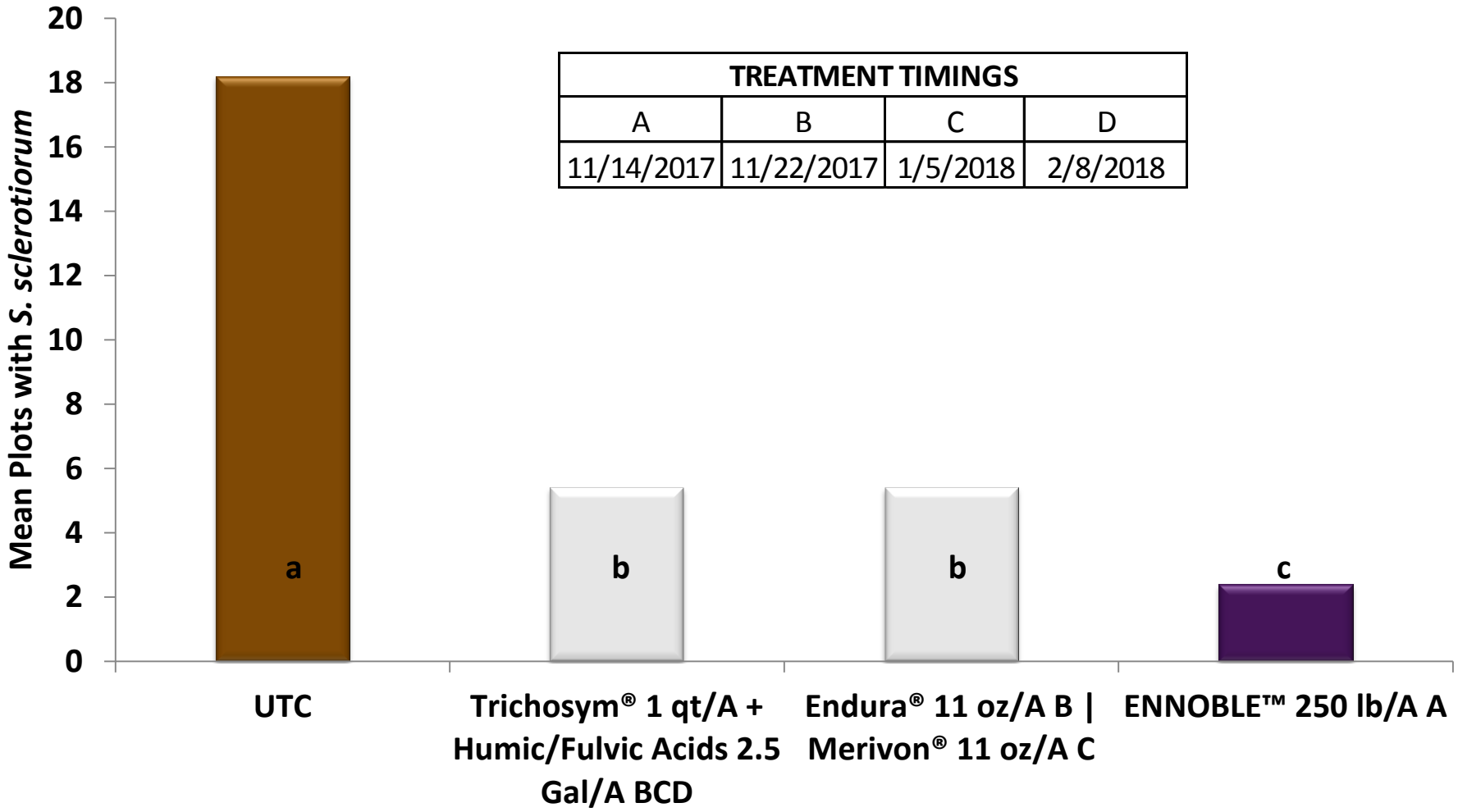
TREATMENT TIMINGS					
A	B	C	D	E	F
12/08/16	01/31/17	02/16/17	03/02/17	03/17/17	04/03/17



Marrone Bio Innovations

ENNOBLE™ on *Sclerotinia sclerotiorum* in Lettuce

Dr. Matheron, University of Arizona, Yuma, AZ.

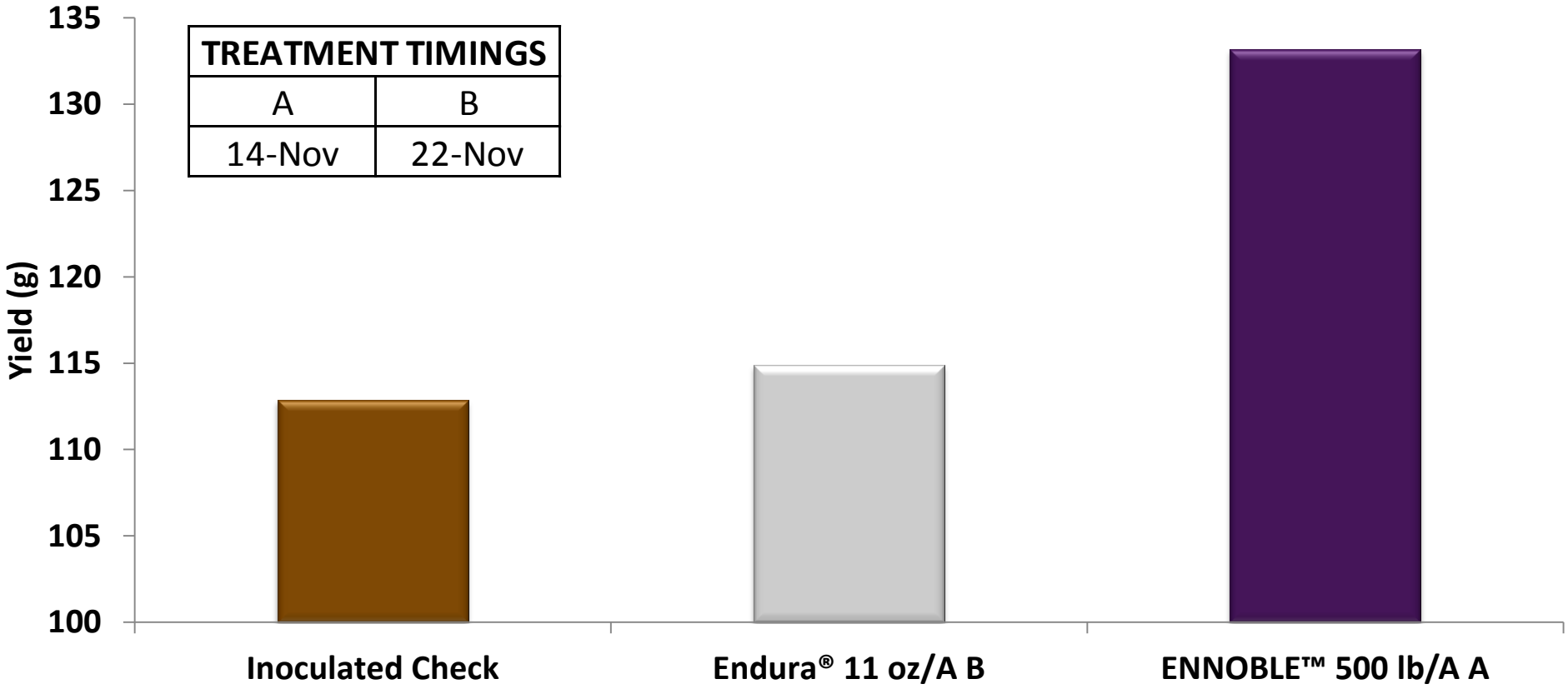


TREATMENT TIMINGS			
A	B	C	D
11/14/2017	11/22/2017	1/5/2018	2/8/2018

Marrone® Bio Innovations

ENNOBLE™ on *Sclerotinia sclerotiorum* in Lettuce

Research Designed for Agriculture, Yuma, AZ

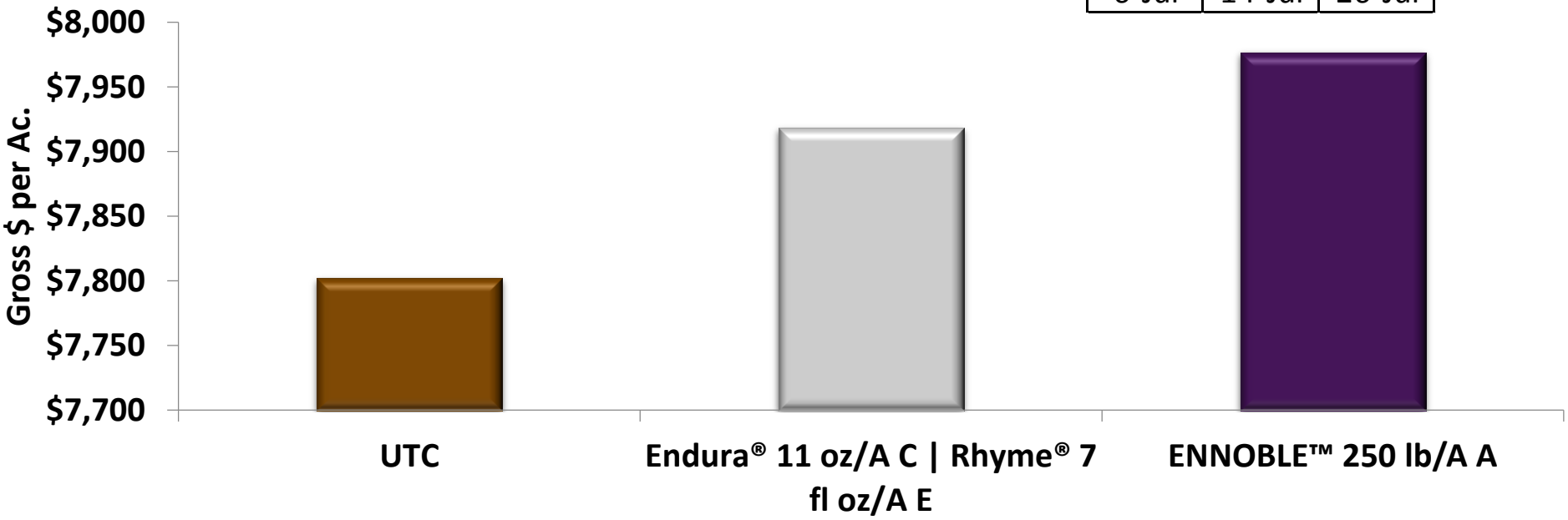


Marrone® Bio Innovations

ENNOBLE™ on *Verticillium* in Lettuce

Pacific Ag Research, Salinas, CA.

TREATMENT TIMINGS		
A	C	E
6-Jul	14-Jul	26-Jul

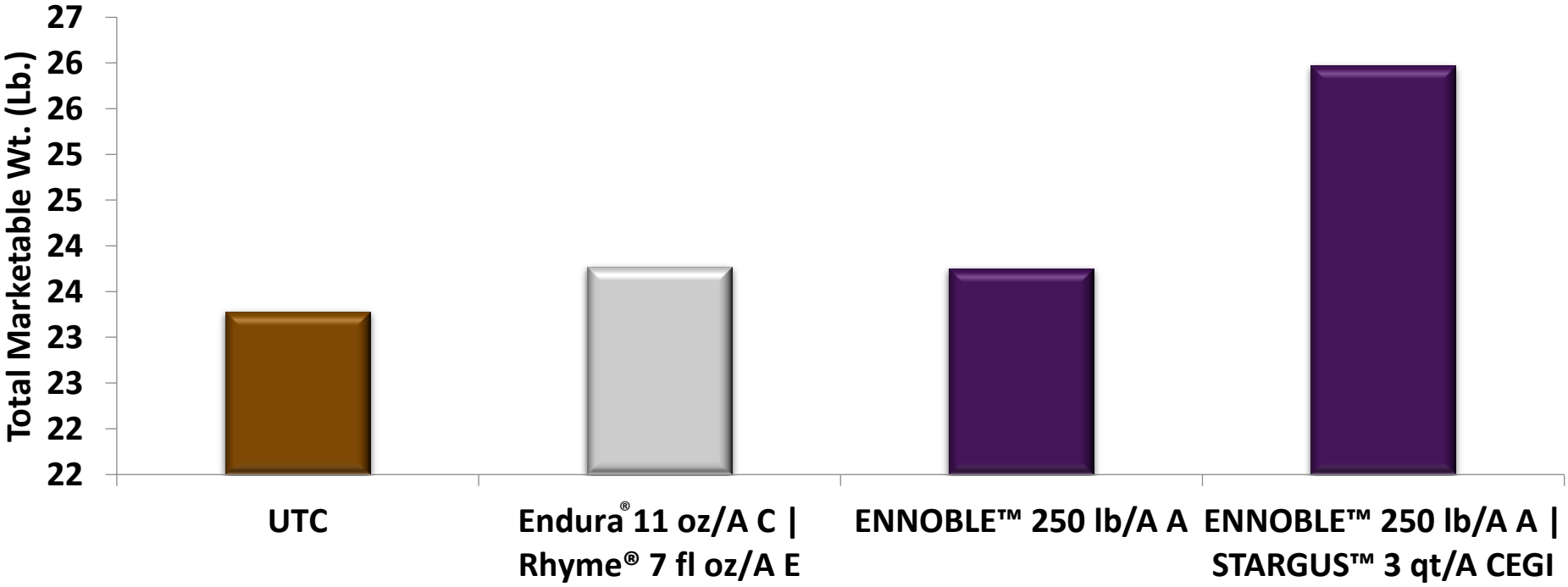


Marrone® Bio Innovations

ENNOBLE™ & STARGUS® on *Verticillium* in Lettuce

Pacific Ag Research, Salinas, CA.

TREATMENT TIMINGS				
A	C	E	G	I
6-Jul	14-Jul	26-Jul	9-Aug	23-Aug

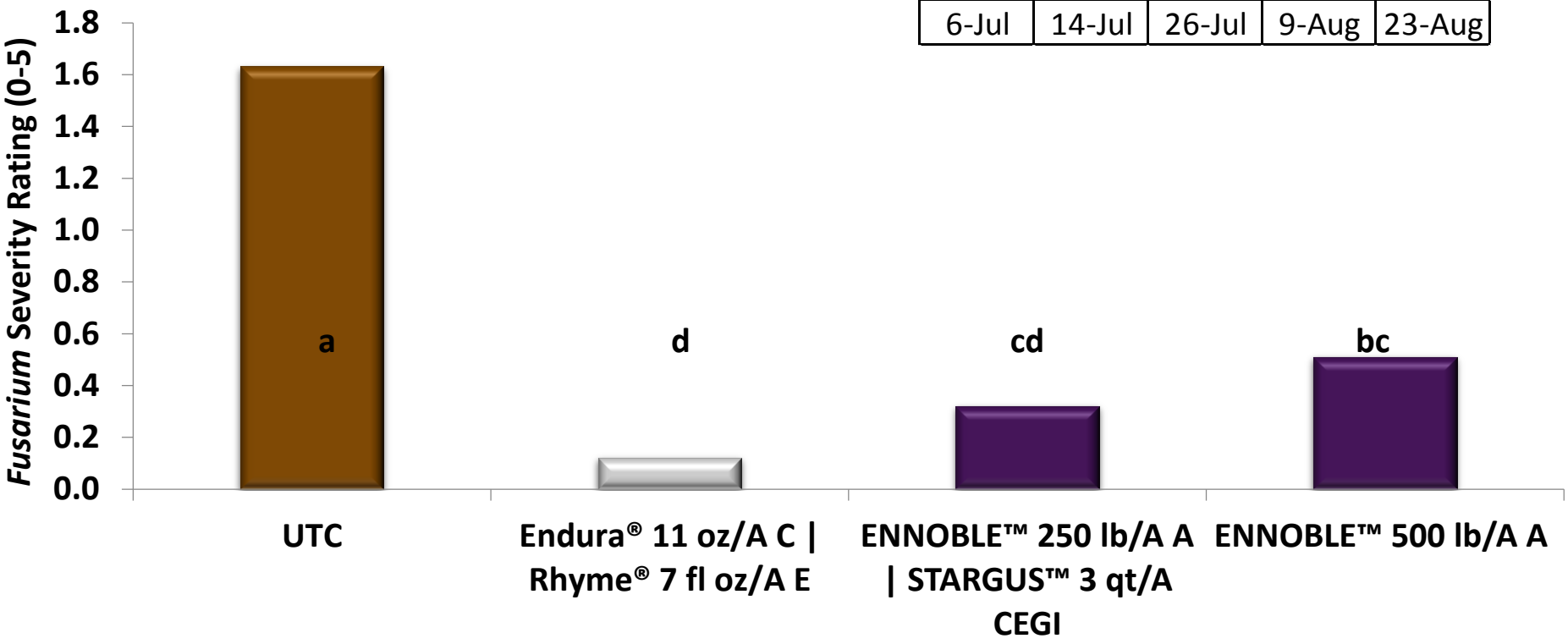


Marrone® Bio Innovations

ENNOBLE™ & STARGUS® on *Fusarium* in Lettuce

Pacific Ag Research, Salinas, CA.

TREATMENT TIMINGS				
A	C	E	G	I
6-Jul	14-Jul	26-Jul	9-Aug	23-Aug

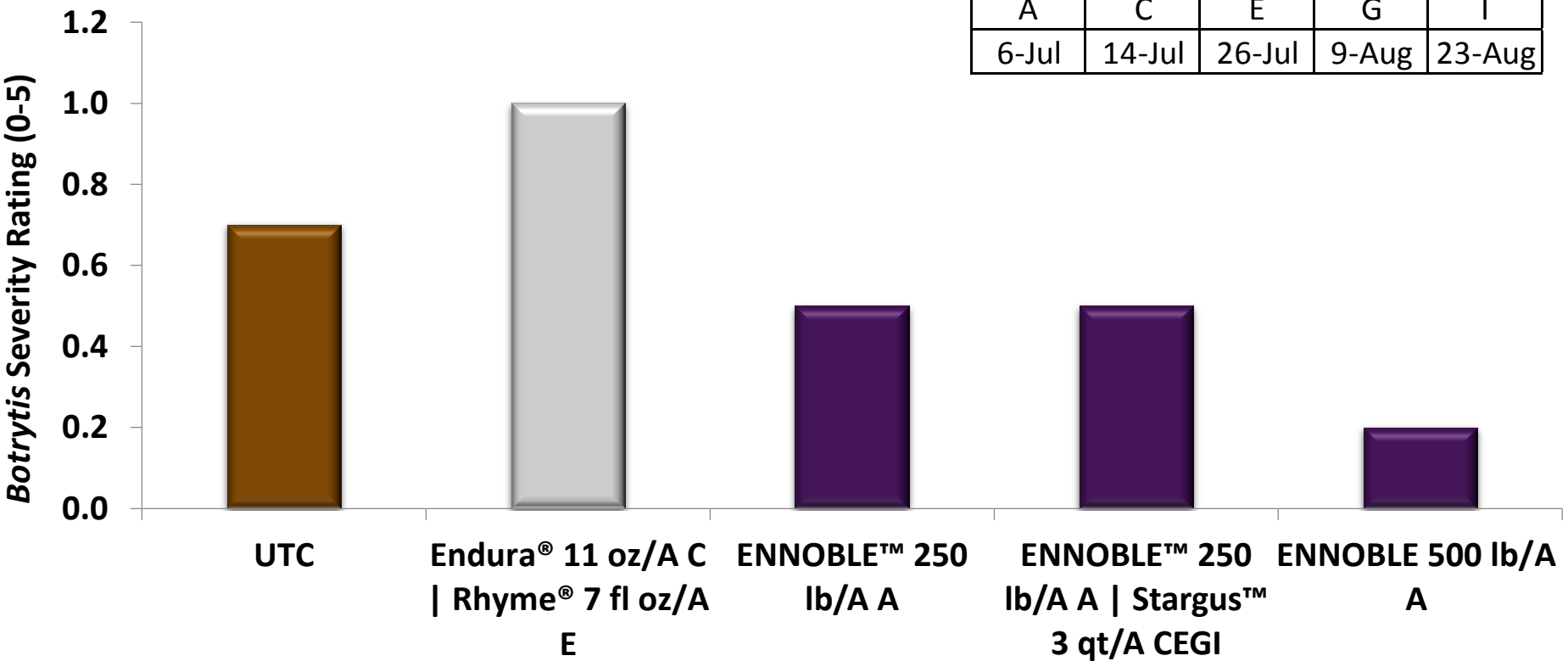


Marrone® Bio Innovations

ENNOBLE™ & STARGUS® on *Botrytis* in Lettuce

Pacific Ag Research, Salinas, CA.

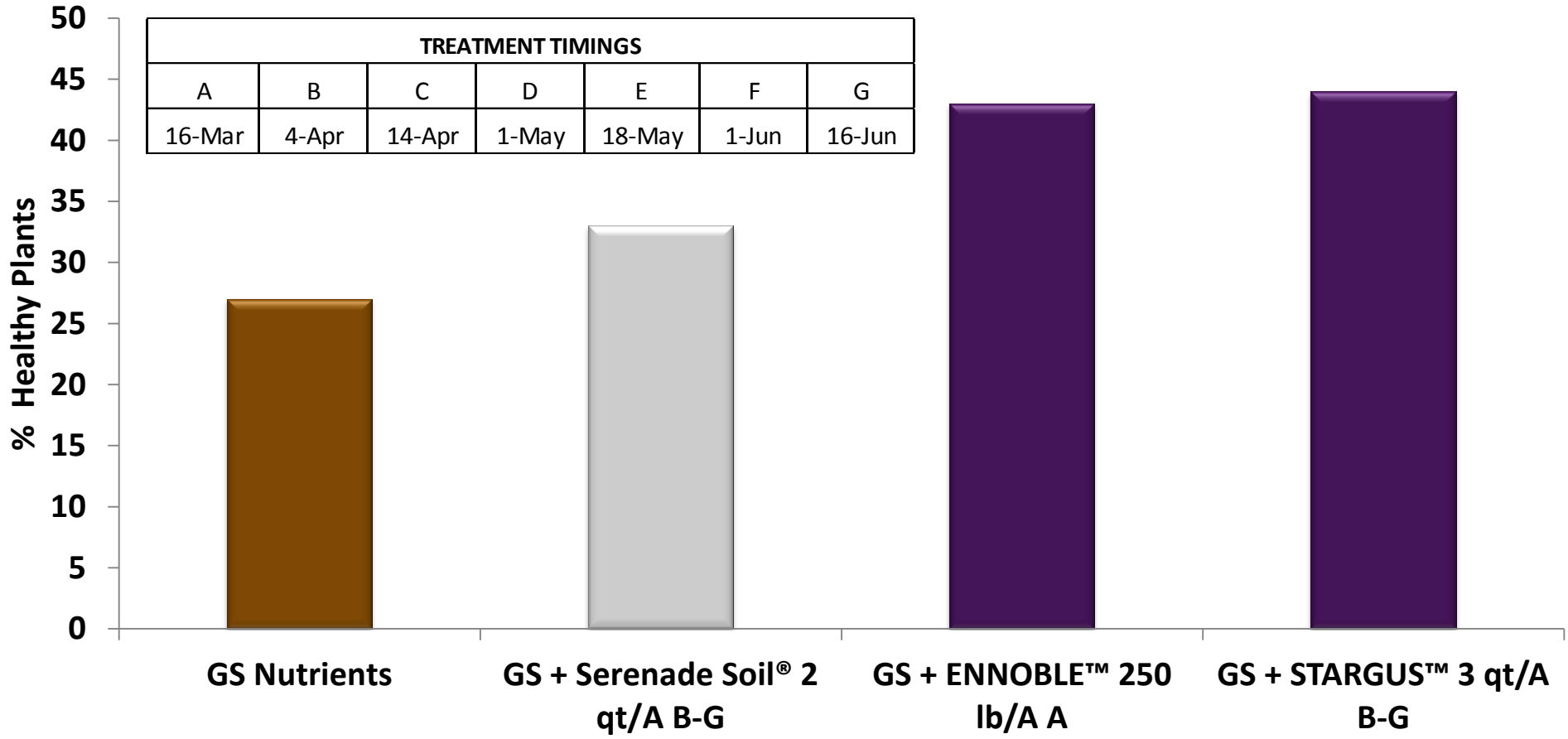
TREATMENT TIMINGS				
A	C	E	G	I
6-Jul	14-Jul	26-Jul	9-Aug	23-Aug



Marrone® Bio Innovations

ENNOBLE™ & STARGUS® on *Fusarium* in Celery

Holden Research, Camarillo, CA.



Marrone® Bio Innovations

Marrone® Bio Innovations

Thank you!

moneal@marronebio.com