Commercial Extract of the Brown Seaweed *Ascophyllum nodosum* (Acadian) Enhances Growth and Yield of Strawberries

FIVE YEARS OF TRIALS

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Ventura County

- 100,000 irrigated acres out of 8.1 million irrigated acres in California (1.2% of California production by land mass)
- Farm gate income of about $2 billion (2012 report) out of $40 billion for the state of California (almost 5% of state value)
- Strawberries worth $691 million in Ventura county in 2012
- Eighth highest farm gate income by county in California and 10th for the United States.
Who am I?

• I have worked in production agriculture in Ventura county and much of California for 40 years now.
• Specializing in Integrated Pest Management and Nutrient Management for subtropical crops (avocados, citrus, wine grapes), cool and warm season vegetables (broccoli, cabbage, celery, lettuce, spinach, cucumbers, peppers, tomatoes, etc.), and berries (blueberries, raspberries, and strawberries).
• I have worked with over 100 of the 400 plus crops grown in California including almonds, cotton, table grapes, pistachios, potatoes, sweet potatoes, etc.
• I have just completed my 14th full season specializing in applied agricultural production research, but I have been involved in production research for over 30 years.
This research examines effects of *Ascoplyllum nodosum* seaweed extract applied through the drip irrigation on growth and yield of strawberries.
Trial Treatments and Methods

1. Untreated control (grower’s normal program)
2. Grower’s normal program with Acadian seaweed extract applied every two weeks at 2 qt/A through the drip irrigation beginning 2 weeks after planting
3. The first three trials also included a preplant dip at .1%

Trials were randomized strip trials because the treatments were applied through the commercial drip lines. Data was summarized across all four years of trials. Trials were conducted near Oxnard, CA.
Third study being planted
2009 Summer Trial
Third study, 2009 Summer Trial
Each treated area had six random pick areas assigned.
Total yield was enhanced all four years. The average yield increase was 395 trays per acre which is a 17% yield increase.

Means followed by the same letter are not different, Duncan's new MRT, p=.02
Based on an average price of $7.00 per tray, this equates to an average revenue increase of $2147 dollars per acre.
Means followed by the same letter are not different, Duncan's New mrt, p=.04
There were significantly more crown divisions by the beginning of the harvest season (4 months after planting)
Mung Bean Assay Demonstrates Acadian Rooting Effects
Other Interesting Data from 2013-2014 Study
Charcoal Rot
Charcoal Rot is an Increasing problem in California
Steve Koike and Mark Bolda
farms.com, Aug 06, 2013

• “The disease, called charcoal rot, appears to be the most important current concern for the industry due to its steady increase over this period of time.”
• “Most recently this disease has been confirmed in Santa Barbara, Monterey, Santa Cruz, and Santa Clara counties. “
• “The spread of Macrophomina to new fields and counties portends that charcoal rot may be a long term threat to the industry which at present does not have satisfactory plant resistance with which to combat the pathogen.”
• “Current management strategies involve the following: (1) Crop rotation (2) Pre-plant fumigation (3) Avoid stressing the plants and (4) Sanitation.”
2013-2014 Trial
*Macrophomena phaseolina*, Charcoal Rot
Percent Plant Mortality

![Graph showing percent plant mortality over days after planting for different treatments.](image)

- Untreated
- Acadian

P = 0.003, Duncan's new MRT at final rating.
Charcoal Rot in non-fumigated buffer area
Two Spotted Spider Mite
Number of Mites Per Leaf

P = .05, Duncan’s new MRT
Comments and Conclusions

• *A. nodosum* seaweed extract improved crown division.

• This resulted in a significant improvement in yield.

• Applications of Acadian seaweed extract resulted in healthier, less stressed plants that better resisted two spot spider mites and charcoal rot.
A bit more Strawberry Data

- Seven Years worth of Data, covering 22 field trials.
- Includes the previous Acadian Materials
- Also includes other biostimulant materials, including microbial based.
Seven Years of Yield Data for Strawberries Treated with Biostimulants

Holden Research and Consulting Biostimulants on Strawberries from 2007 to 2014 Percent Difference in Production for Harvest Days Tracked over the Grower Standard

18.7% Average for all
Dollar Value 2007-2014

Holden Research and Consulting Biostimulants on Strawberries from 2007 to 2014 Net Dollars per Acre Difference in Production for Harvest Days Tracked over the Grower Standard

$1358/ac Average for all
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