

March 1st

NARC/W3008/StR Annual Meeting

Objective B8

Economics Component



Stop the Rot

Combating onion bacterial diseases with pathogenomic tools and enhanced management strategies

<https://alliumnet.com/projects/stop-the-rot/>

USDA NIFA SCRI Project No. 2019-51181-30013



UNIVERSITY OF
GEORGIA



United States
Department of
Agriculture

National Institute
of Food and
Agriculture

Year 1 and 2 Activities – Economics Component

Survey of Onion growers, Stakeholder advisory panel, Project Team to assess:

- The prevalence and severity of bacterial diseases and rots of onions
- Effectiveness of existing management strategies for bacterial diseases
- Critical research and management needs of the onion industry
- Areas of agreement/divergence between growers, SAP, and project team

Preliminary economic analysis of 2020 bactericide and plant defense activator trials in Georgia, New York, and Washington

- Profit/loss comparison of commercial products compared to non-treated control

Economic analysis of 1st year of Georgia field trials

- Profit/loss comparison of low input vs. high input vs. grower standard

Insights from the Grower Survey

Growers estimate for their area over the past 5 years:

- On average, more than 10% of production has been lost due to onion rots and bacterial diseases
- Nearly 20% of growers have experienced a catastrophic loss of more than 50% of their crop
- Only 20% of growers have experienced, on average, minor losses of less than 5% of their crop.

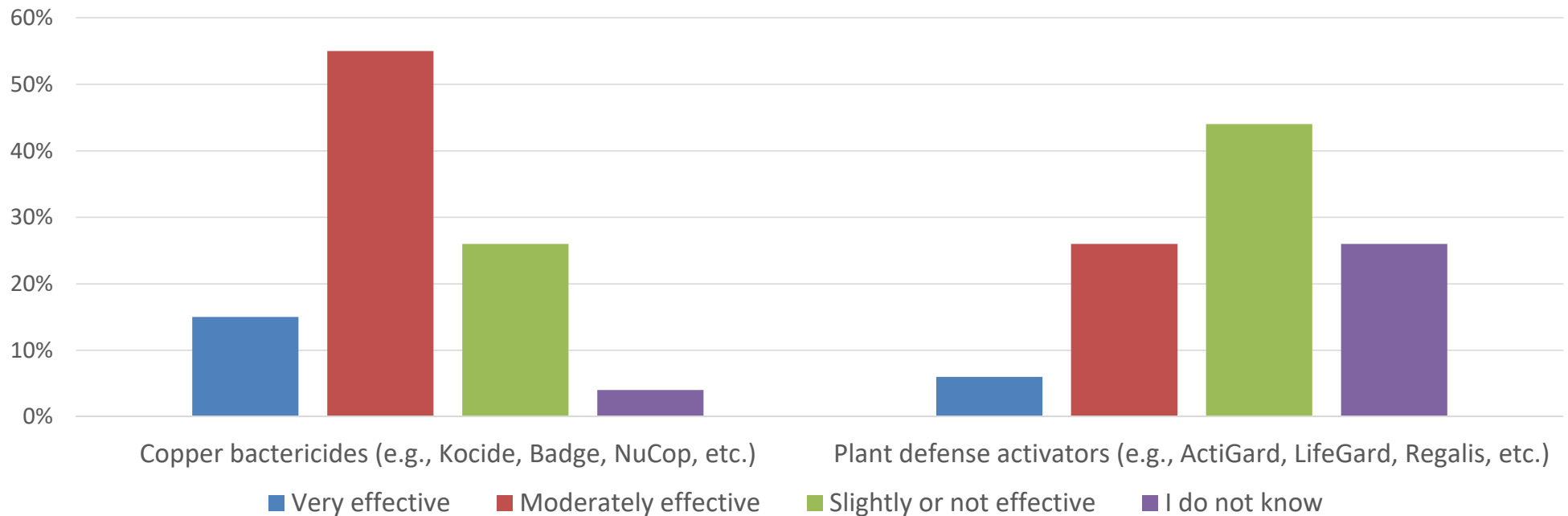
The average grower can be characterized as being:

- Very concerned about bacterial diseases and bulb rots
- Limited in their ability to identify diseases caused by bacteria
- Unaware of the specific bacterial pathogen that caused losses in their area
- Only moderately equipped in terms of management strategies to reduce economic losses
- Predominantly reliant upon information from University-based extension services to manage bacterial diseases of onions.

Overall: There is an opportunity for this project to significantly improve the bottom-line of onion growers' operations through (a) evidence-based successful management strategies and (b) information and outreach efforts through agricultural Extension.

Grower Perceptions of Bactericide and Defense Activator Effectiveness in Reducing Losses

Based upon your experience, how effective do you perceive the following strategies for reducing losses from onion bacterial diseases and bulb rots?



Stop the Rot: Combating onion bacterial diseases with pathogenomic tools and enhanced management strategies

Economic Comparison of Bactericides and Plant Defense Activators for Control of Bacterial Bulb Rot in Onion

Efficacy Comparison

Field Trials by Dutta, Hoepting, and du Toit found that compared to non-treated control:

GA – Statistically significant lower incidence of center rot bulbs for almost all products tested

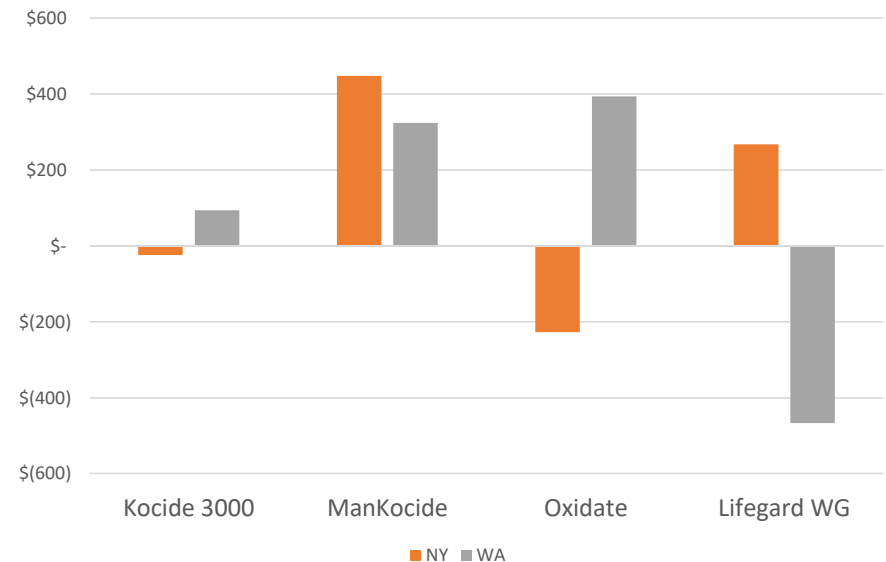
NY and WA – Found no significant differences for any product.

Economic Comparison:

GA - All products (Actigard, Champ, Kocide, Leap, LifeGard, Mankocide, Mastercop, Nordox, NUCop, Oxidate) yielded a substantial increase in per-acre profit.

NY and WA – Economic returns were mixed and not statistically significant. Based on the field trials and current chemical prices, some products delivered a marginal economic gain and others a loss.

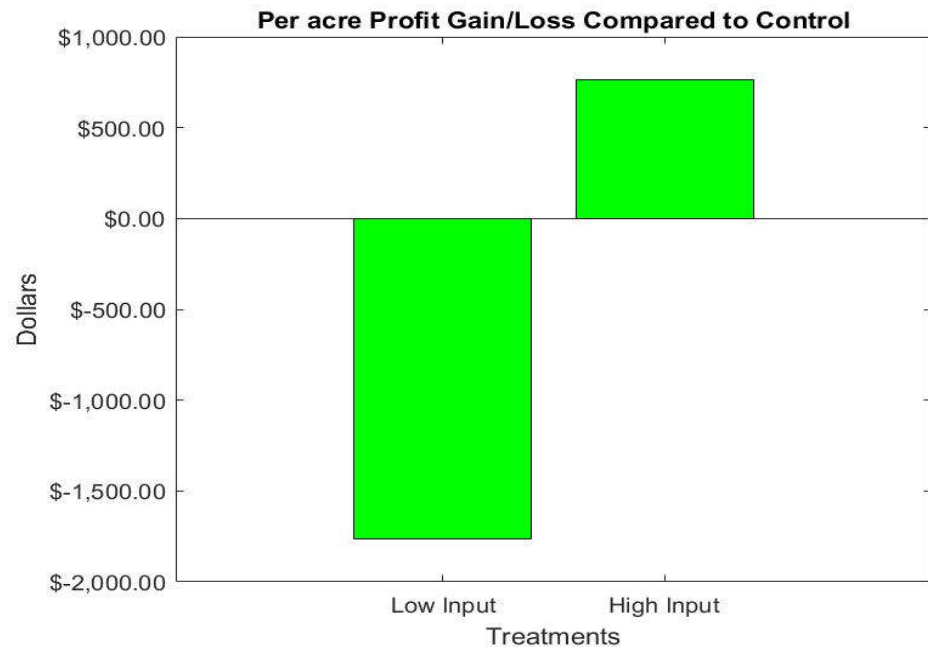
Average Per Acre Economic Return of Common Bactericides and Plant Defense Activators in Onions, Relative to Non-treated Control, Based on Trial Data in NY and WA



Economic Returns to Input Intensity in GA

Field trials in GA (Dutta and Turner) assessed onion losses due to center rots under:

- Low Input – Goal x1, Prowl, Copper x2
- Grower Standard – Goal x1, Prowl, Copper x4, Mustang Maxx
- High Input – Goal x2, Prowl, Copper x8, Torac, Radiant



Even at elevated chemical prices in the U.S., substantial economic returns were found for the high input strategy due to the significantly lower percentage of center rots relative to other treatments

Preliminary Plans for Season 3

- 1. Complete economic analysis of 1st year of bactericide trials in GA, NY, and WA**
 - Include variance of outcomes to assess risk-adjusted economic returns
- 2. Economic analysis of nitrogen application rates in NY**
 - Develop framework applicable to individual states and a cross-state comparison
- 3. Begin economic analysis of onion harvesting equipment and methods experiments**

Questions and Inputs from the Stakeholder Advisory Panel

1. How does the Stakeholder Advisory Panel perceive that other growers consider/calculate the use of inputs like bactericides, herbicides, and nitrogen? Profit maximization, yield maximization, variance reduction, risk reduction, insurance, etc.?



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More information about the project:

- <https://alliumnet.com/projects/stop-the-rot/>
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