

March 27, 2024

StR Stakeholder Advisory Panel 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 4 Activities – Economics Component

Developed Endline Survey of Onion growers:

- The prevalence and severity of bacterial disease and rots of onions.
- Effectiveness of existing management strategies for bacterial diseases.
- The impact of the project on changing perceptions and practices for managing economic losses due to bacterial diseases.

Administered Endline Survey to the Stakeholder Advisory Panel and the Stop the Rot Team:

- Assess the impact of the project's field experiments on changing perceptions of cultural practices.
- Highlight opportunities for grower education and needs for further research

Economic analysis of bactericide and plant defense activators

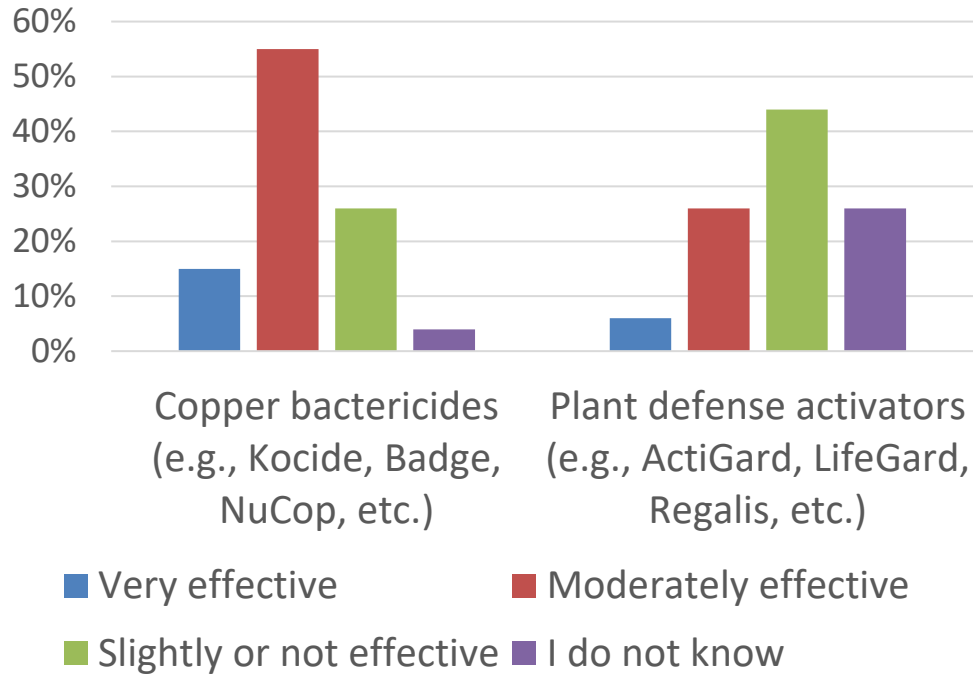
- Profit/loss comparison of commercial products compared to non-treated control

Economic analysis of low- and no-additional cost cultural management strategies to reduce onion losses

- Timing of topping, timing of undercutting, rolling of tops, and neck clipping length.

Year 2000 - Grower Perceptions of Bactericide and Defense Activator Effectiveness in Reducing Losses

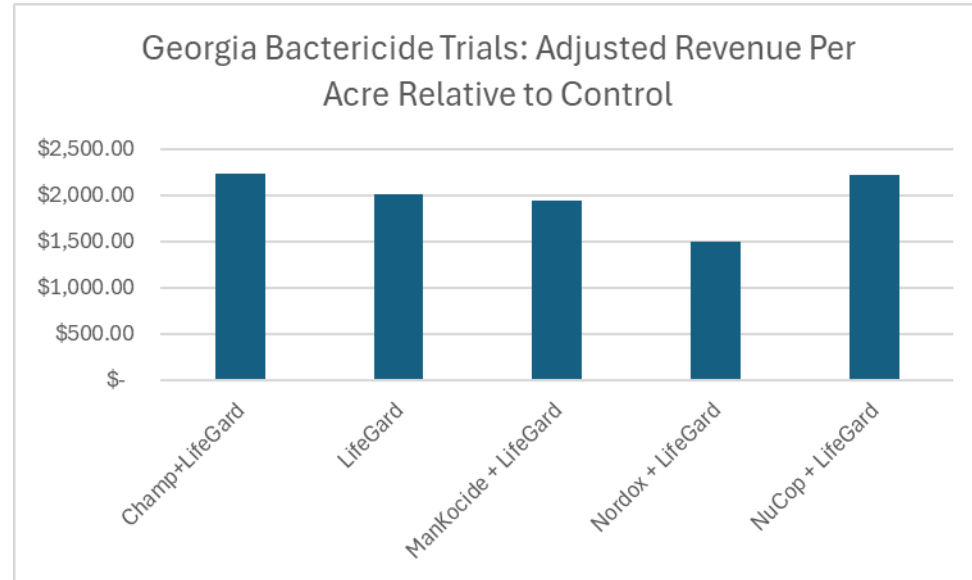
Based upon your experience, how effective do you perceive the following strategies for reducing losses from onion bacterial diseases and bulb rots?



Year 2023 – Stakeholder Advisory Panel and Project Team Member Perceptions of Bactericides in Washington and Colorado

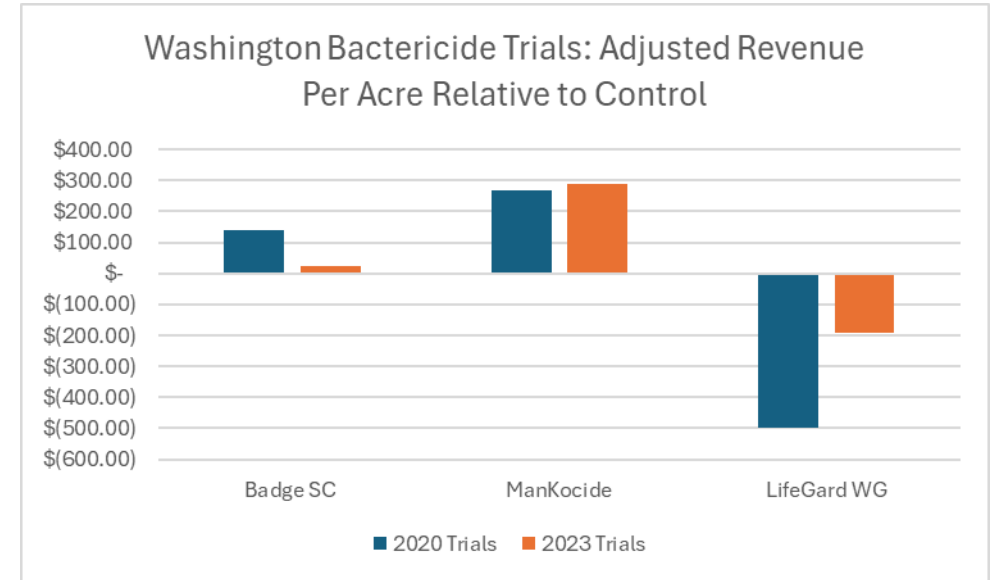
	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
I am convinced that CO and WA growers should stop/reduce bactericide treatments.	17%	50%	25%	0%	0%
I would feel comfortable recommending growers in CO and WA stop/reduce the use of bactericide treatments.	25%	33%	25%	8%	0%
This research question is answered. It does not need more research effort	8%	50%	8%	8%	17%
I think the research team will be successful in convincing growers to change their behavior	0%	33%	50%	8%	0%
The CO and WA trial results do not reflect the efficacy growers think they get from bactericide treatments in onion crops	17%	8%	58%	0%	0%

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



Economic Comparison:

GA – Due to a significantly greater incidence of bulb rot in the non-treated check, all tested products significantly improved per acre returns. Results are not sensitive to input prices or onion prices.



Economic Comparison:

WA – Trial data from Washington found no, or marginally, statistically significant impact of bactericides on marketable yield.

Economic Returns to Input Intensity in GA

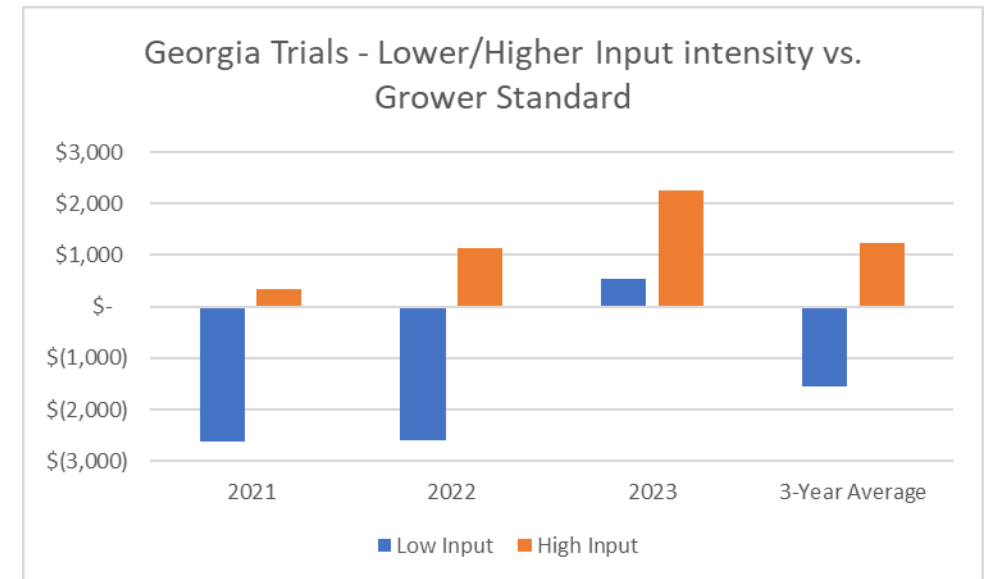
U.S. Price Indices Paid by Farmers for Selected Inputs, 2020-23/1

Input	Annual average			First quarter (January–March)		
	2020	2021	2022	2022	2023f	Change ¹ Percent
Seeds and plants	113.1	117.6	117.3	117.3	117.3	0.0
Fertilizer, nitrogen	69.9	90.9	151.6	150.0	123.3	-17.8
Fertilizer, potash/phosphate	68.1	85.1	110.1	111.0	93.3	-15.9
Chemicals, insecticides	93.2	98.7	137.6	110.7	135.6	22.5
Chemicals, herbicides	96.4	105.3	146.8	118.1	144.7	22.5
Chemicals, fungicides/other	94.7	97.8	136.4	109.8	134.5	22.5
Fuels, diesel	52.5	73.3	112.9	96.9	99.7	3.0
Fuels, gasoline	59.6	78.5	104.4	97.1	89.9	-7.4
Farm machinery	124.8	145.6	171.4	163.7	176.3	7.7
Farm supplies	117.4	127.5	142.1	137.5	145.0	5.4
Custom services	119.6	114.7	126.0	126.0	126.0	0.0
Building materials	120.8	140.5	163.6	160.1	164.7	2.9
Cash rent	124.5	124.5	126.1	126.1	129.0	2.3
Interest	110.9	111.4	112.9	128.6	142.7	11.0
Taxes	126.8	130.0	134.9	138.1	143.8	4.1
Wage rates	138.2	146.1	156.9	157.6	158.4	0.5
Crop sector ²	111.1	119.0	134.5	132.0	137.0	3.8
Vegetable sector ³	113.1	121.3	138.8	135.5	137.0	1.1

Source: Vegetable and Pulse Outlook: April 16, 2022, VGS-368 USDA, Economic Research Service.

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

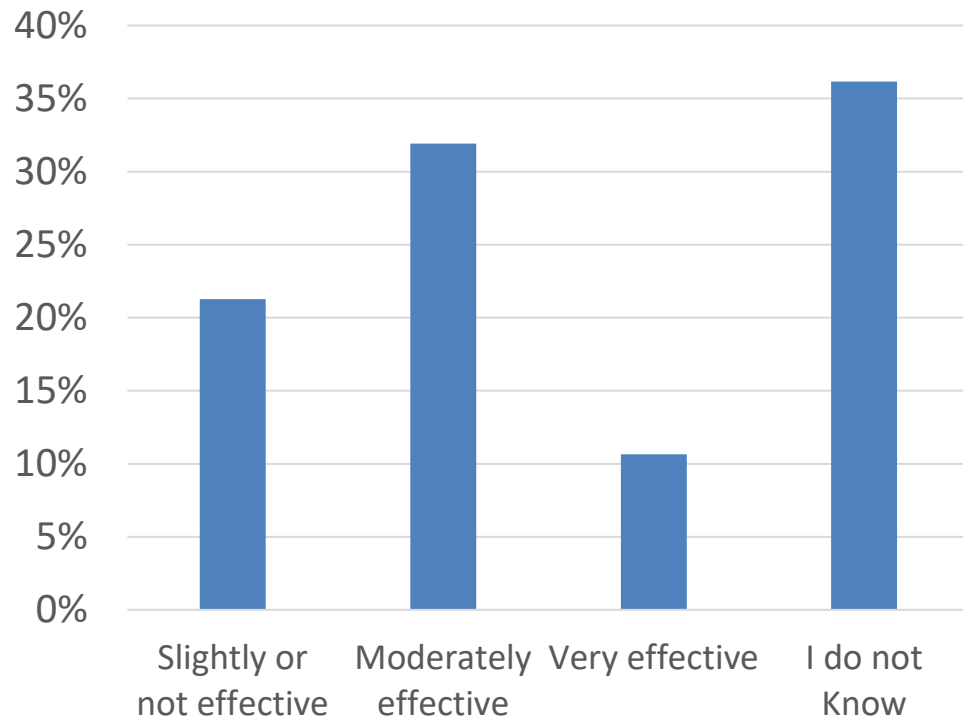
- Low Input – Goal x1, Prowl, Copper x2
- Grower Standard – Goal x1, Prowl, Copper x4, Mustang Maxx
- High Input – Goal x2, Prowl, Copper x8, Torac, Radiant



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

Year 2000 - Grower perceptions of undercutting bulbs and bulb rots

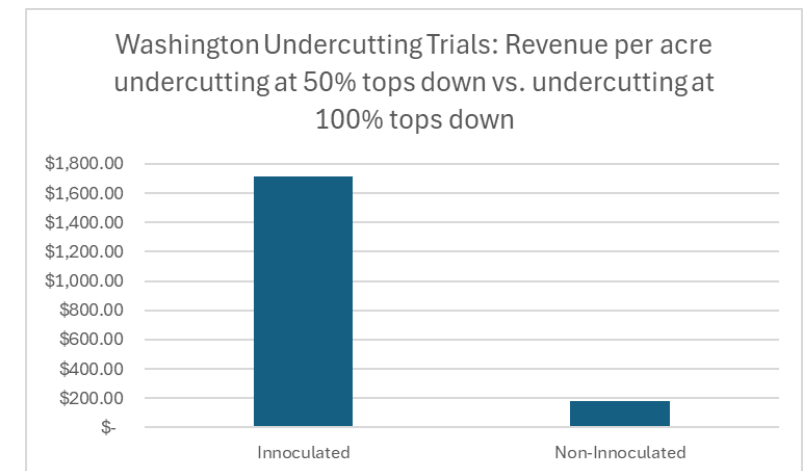
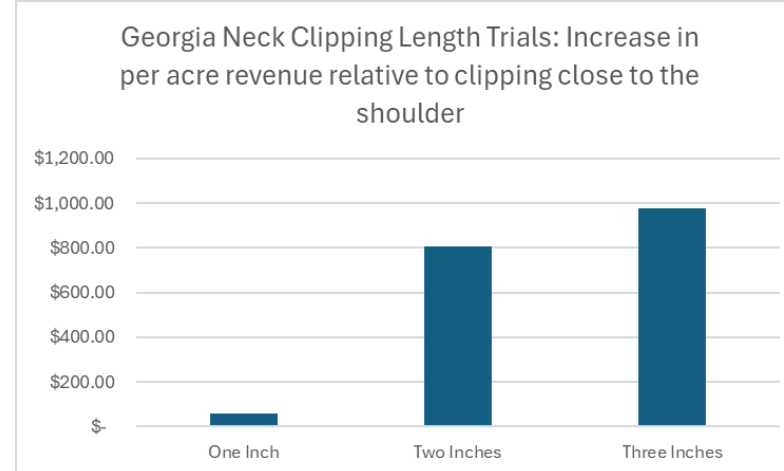
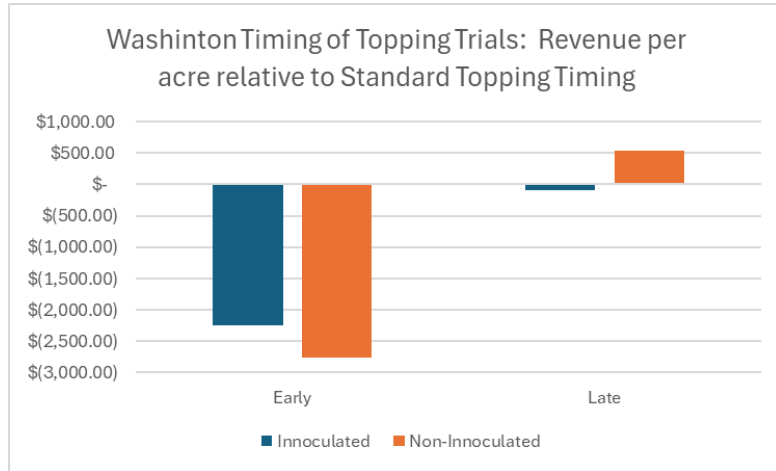
How effective do you perceive undercutting bulbs to be for reducing losses from onion bacterial diseases and bulb rots?



Year 2023 – Stakeholder Advisory Panel and Project Team Member perceptions of the timing of topping in Washington

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
I am convinced that WA growers should not top bulbs early, when there is still moisture in the necks	33%	50%	17%	0%	0%
I would feel comfortable recommending to growers in WA that they not top bulbs early when there is still moisture in the necks	33%	50%	17%	0%	0%
This research question is answered. It does not need more research effort	17%	42%	17%	17%	8%
I think the research team will be successful in convincing growers to change their behavior to avoid topping early when the necks are still moist/green	17%	42%	42%	0%	0%

Economic Returns to Low- and No-additional Cost Cultural Management Strategies to Reduce Onion Losses



Economic Comparison:

WA – Early topping reduced marketable yield, resulting in a significant reduction in per acre revenue. Late topping did not have a statistically significant impact, relative to the standard timing of topping.

Economic Comparison:

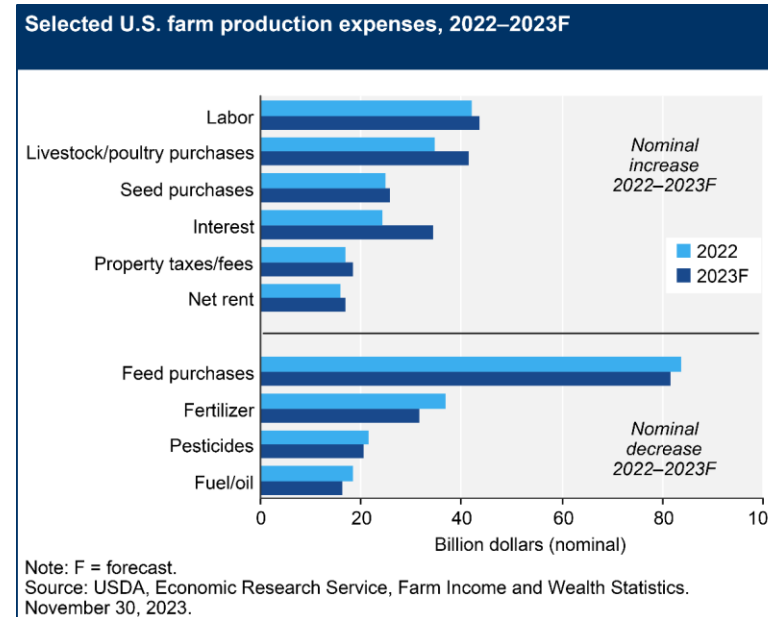
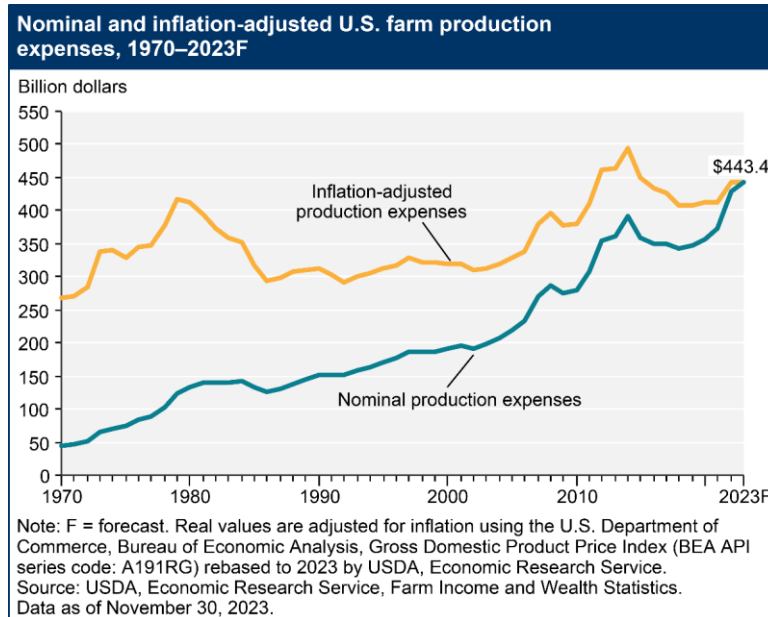
GA – Experiments in Georgia found significantly lower incidence of bulb rots when necks were clipped at two-three inches relative to one inch or close to the shoulder, leading to a significant increase in per-acre revenue.

Economic Comparison:

WA – Experiments in Washington found that undercutting bulbs at 50% tops down significantly decreased losses compared to undercutting 2 weeks later at 100% tops down, resulting in a significant increase in per-acre revenue

General Economic Findings

1. Increases in input prices experienced during the project (chemicals and nitrogen) has not changed the economics driving the decision to use or not use. For the products considered in this project, if there is a marginal (or greater) positive yield response, there is in general a positive economic return.



2. Optimizing the timing of cultural practices growers are already using as part of their operation offers the opportunity to increase revenue at little to no additional cost.
3. VERY preliminary evidence from responses by growers indicates there may be some change in perceptions over the last four years on strategies to reduce economic losses in onions from bacterial diseases.

Help “Stop the Rot”! Please take our Onion Survey

‘Stop the Rot’ USDA NIFA SCRI Onion Bacterial Project 2019-51181-30013



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More information about the project:

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