



GUARDIAN



A PharmGrade Product

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PRODUCT INFORMATION

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GUARDIAN is a concentrated biological inoculum formulated with broad spectrum, beneficial bacillus and Trichoderma fungi species. **GUARDIAN** is known as a Plant Growth Promoting Rhizobacteria (PGPR). This inoculum provides more than traditional plant nutrient uptake by promoting healthy soil biofilm on strategic root and plant surfaces. These AGBIOFILM® layers become strategic exchanges for nutrient flow and relief of crop stress. Carbon flows efficiently back and forth through these layers carrying nutrient to the plant and sugars back to the microbes. This exchange is the key for effective yield increase. **GUARDIAN** is rich in food for microbes. **GUARDIAN** is a liquid substrate to establish AGBIOFILM® ecosystems in the soil, on the leaf surface and the root rhizosphere. **GUARDIAN** applications provide the best means to transport, propagate, and stabilize biological cultures on these AGBIOFILM® surfaces. **GUARDIAN** may stimulate root development, increase plant vigor, yield and quality of produce.

RECOMMENDED APPLICATION

For use on all agricultural crops and applications.

Application and Rates: Apply 3-7 gallons per acre 3-4 times per year on all field crops. This product can also be used in the following ways; foliar, fertigation, root drench, and in furrow at planting. Mix 1.5-2.5oz per gallon of water to apply as a root dip, foliar feed or to pre irrigate rows. Apply 1 gallon of mix per 100 linear feet of row.

Contact a local PHARMGRADE representative for more specific rates and instructions.

This product may be mixed with a variety of fertilizers and pesticides. Please call for further directions. Always perform a jar test to ensure compatability.



CONTAINS NON-PLANT FOOD INGREDIENTS

Bacillus amyloiquefaciens	3.15x10 ⁵ cfu/ml
Bacillus licheniformis	2.25x10 ⁵ cfu/ml
Bacillus megaterium	1.80x10 ⁵ cfu/ml
Bacillus pumilus	1.62x10 ⁷ cfu/ml
Bacillus subtilis	4.73x10 ⁶ cfu/ml
Bacillus subtilis var natto	3.60x10 ⁶ cfu/ml
Bacillus simplex	8.10x10 ⁷ cfu/ml
Bacillus firmus	5.40x10 ⁶ cfu/ml
Bacillus polymyxa	1.35x10 ⁵ cfu/ml
Bacillus mucilaginosus	1.80x10 ⁵ cfu/ml
Bifidobacterium animalis	1.35x10 ⁵ cfu/ml
Bifidobacterium bifidum	2.70x10 ⁵ cfu/ml
Bifidobacterium longum	2.70x10 ⁵ cfu/ml
Lactobacillus acidophilus	2.25x10 ⁵ cfu/ml
Lactobacillus buchneri	5.40x10 ⁵ cfu/ml
Lactobacillus casei subsp. casei	4.05x10 ⁵ cfu/ml
Lactobacillus delbrueckii bulgaricus	9.00x10 ⁴ cfu/ml
Saccharomyces cerevisiae	3.15x10 ⁵ cfu/ml
Streptococcus saivarius subsp. thermophilus	4.50x10 ⁶ cfu/ml
Paecilomyces lilacinus	1.62x10 ⁸ cfu/ml
Penicillium bilaiae	1.80x10 ⁸ cfu/ml
Paenibacillus polymyxa	2.16x10 ⁸ cfu/ml
Trichoderma harizanum	2.30x10 ⁷ cfu/ml
Trichoderma koningii	3.06x10 ⁸ cfu/ml
Trichoderma polysporum	3.06x10 ⁸ cfu/ml
Total Biological Consortium	1.24x10⁹ cfu/ml

HANDLING AND STORAGE

Follow appropriate safety procedures. Skin contact may cause temporary staining. In case of accidental exposure, flush with plenty of water. Product is non-hazardous.

Storage in a cone-bottomed tank to facilitate agitation is recommended. When stored in a cone-bottomed tank, agitate 10 minutes before application or transfer. When stored in a flat-bottomed tank agitate 30 minutes before application or transfer. Avoid airblast agitation or over the top rotation as foaming will result. If foaming does occur through normal agitation, use an approved defoamer. Agitation is recommended once every four weeks. Agitation prior to production transfer and application is required. Storage for longer than 12 months is not recommended.

Caution keep out of reach of children. Contact poison control if ingested.

Derived From: 100% Probiotic Fermentation Media

Information regarding the contents and levels of metals in this product is available on the internet at:
<https://www.aapfco.org/metals.htm>

HIGHLIGHTS (Raft River Idaho)

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- Rotation challenges presented growing Tetons/Clearwaters in ground only rangers do well in.
- Buyer's expected case was 300 bags per acre of marble sized spuds.
- 80% reduction in artificial inputs under this program.



PROTOCOL

- 12 Gals Guardian applied to soil fall or spring (Fall in this case shanked in like fumigant).
- 5 Gals MaxYield in planter mix.
- 7 Gals MaxYield or Nitros fed with 32 through summer.

RESULTS

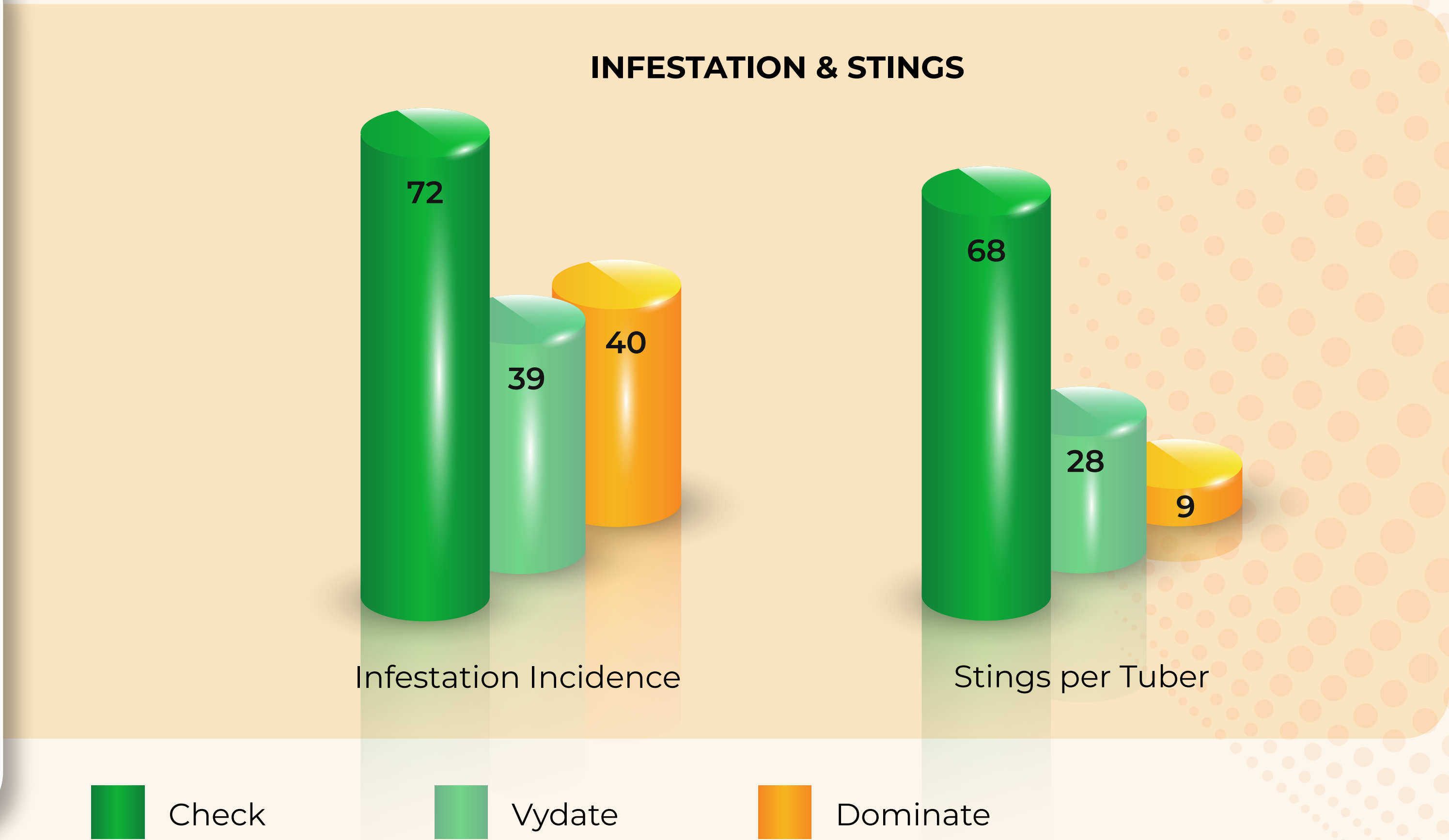
- 510 cwt average on 3 circles running full protocol.
- Buyer was so impressed they had us come explain the program to them.
- Multiple invitations since to present on their national yield calls.

SCHREIBER NEMATODE STUDY



Replicated trials with 3rd party researcher Alan Schreiber in Washington.

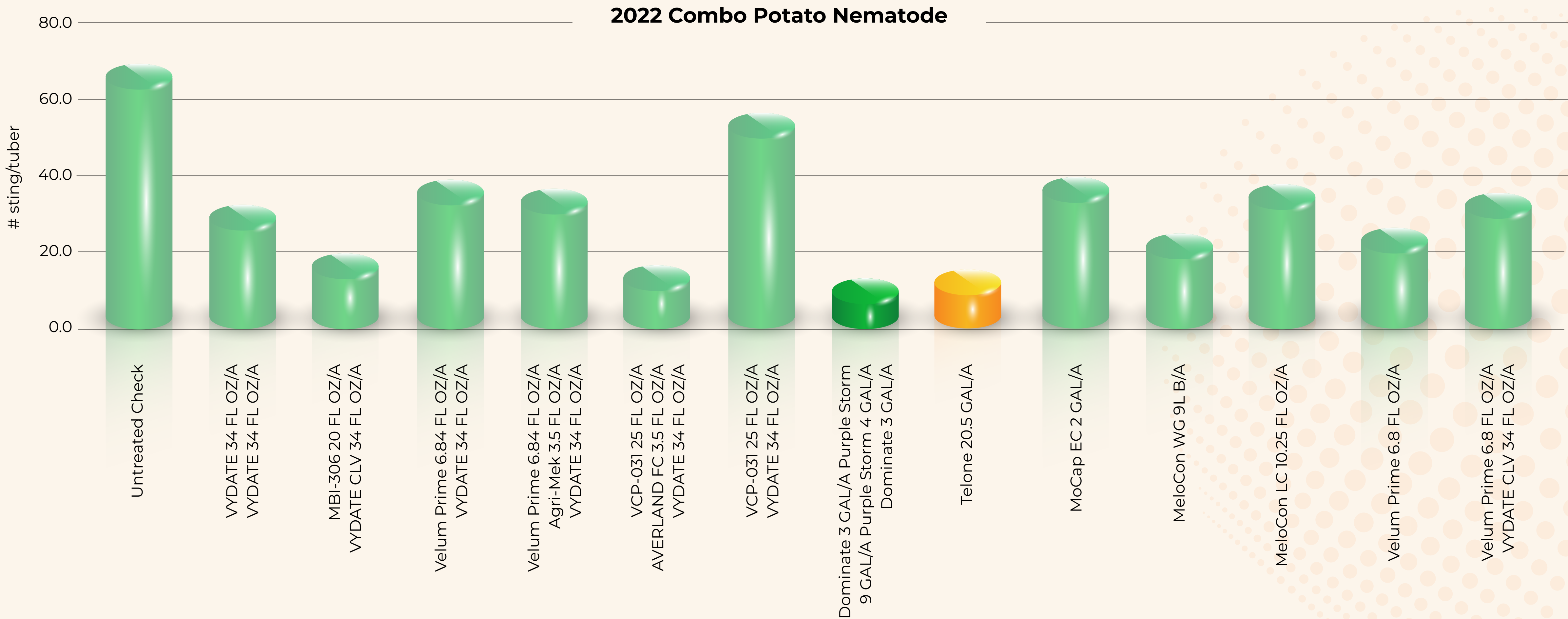
This trial had very heavy nematode pressure this year, with 71.2% incidence and 67.5 stings per tuber severity in the untreated check plots. This pressure is higher than would be expected in a commercial situation.



SCHREIBER NEMATODE STUDY



Out of 35 nematode treatments our product (coded DOM/PurpSTRM) was the most effective treatment for reducing nematode stings.



HUBBARD NEMATODE STUDY

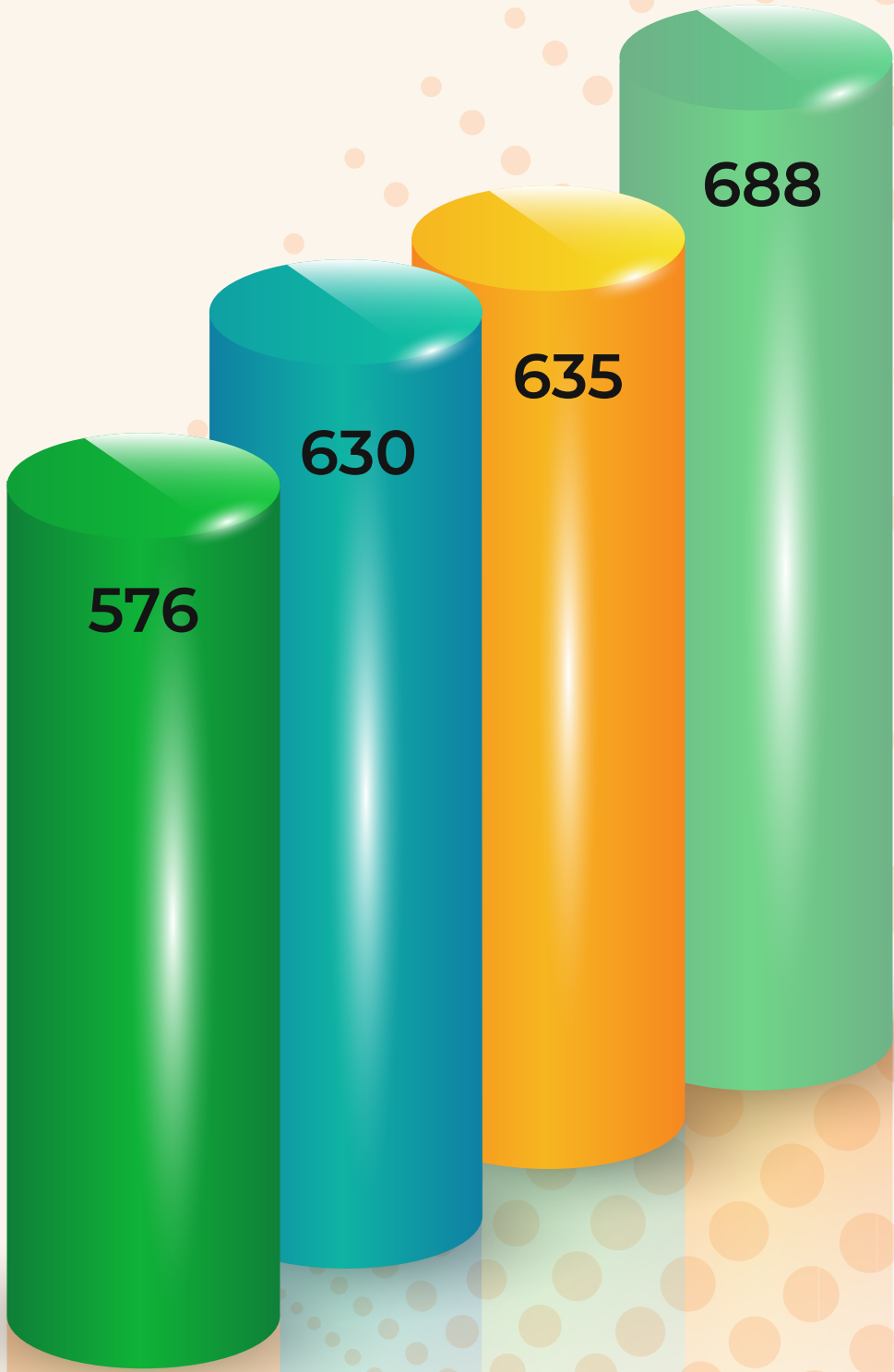
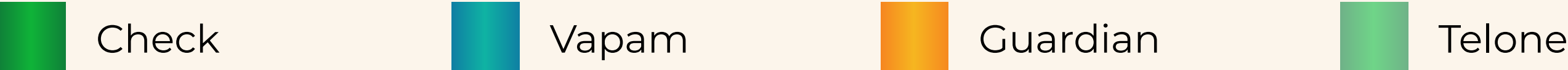


- Replicated trials with 3rd party researcher Mike Hubbard in Washington.
- Compared efficacy with other common treatments.
- Researchers noted they have never seen a soil so high in nematode in their studies.
- Commented that they were very surprised that a biological solution could even begin to match the results that the hard chemistry solutions offer.

TREATED



CONTROL



Yield

GUARDIAN v/s FUMIGATION



Third Party study from planting all the way through what the grower was paid. 2.5xROI

		GUARDIAN	VAPAM	Difference
	% #1	79.86	81.00	1.14
	% Culls	2.95	3.00	0.05
	% Smalls	9.63	5.6	4.03
	% Dirt	2.45	3.46	1.01
	% Bruise Free	65.84	81.68	15.84
	% Prime Payables	87.42	91.39	3.97
	Specifi Gravity	1.091	1.088	0.3
	Avg Tuber Count	45.76	41.03	-4.73
	Avg Length	3.48	3.71	0.17
Incentives	10 oz or Lg Total Potato \$	0.02	0.23	0.21
	10 oz or Lg Prime \$	0.02	0.26	0.24
	Acres	67	74	7
	Yield / Acre	589	460	129
	\$ Per Acre	\$4170.12	\$3463.80	\$706.32
	Cost Per Acre	\$200	\$320	\$120
	Plants / Stems 10 ft Dig	8/26	9/31	1/5
	10 ft Dig Yield cwt	510	456	54
	Mart Test Digs Yield cwt	574	527	47

ALFALFA HIGHLIGHTS

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This study evaluates a targeted application on nematode-damaged alfalfa fields, with 5 gallons applied, 10 gallons in the most affected 40 acres. Photos at 2 and 5 weeks showed clear improvement in plant health and survivability despite visible damage. Results led the grower to order more product, this time including P. lilacus, a new bio-nematicide species.

PROTOCOL

- 5 Gals applied to nematode damaged alfalfa fields (10gal in most damaged 40 acres).
- Previous year nematode damaged plants grew 6 inches, turned white and died.
- Photos taken at 2 and 5 weeks after application.

RESULTS

- While nematode damage can still be seen, marked improvement in plant health and survivability.
- Grower ordered another 5 gals after initial results- new batch included P. Lilacus, a new species shown to be a bio-nematicide.



Pharmgrade pharmgrade.com

As a staunch advocate of sustainable agriculture, Idaho-based Pharmgrade offers breakthrough, probiotic multi-strain biologicals to help farmers and farming corporations ensure superior soil health and increased fertility. Pharmgrade offers breakthrough, sustainable probiotic eco-solutions to enable growers to achieve huge ROIs.

Biovante biovante.com

Biovante provides growers with a range of biological soil, seed, and crop treatment solutions that enhance soil health and improve crop yields. The company restores soil fertility through its innovative suite of biologically-driven technologies that reduces dependency on chemicals.

Janerette's Eco-Friendly Fungi janerettesfungi.com

Janerette's Eco-Friendly Fungi is an innovative research and development institution active in producing bio-stimulants derived from fungi using mycorrhizal technology to create sustainable agriculture and forestry solutions and to combat environmental crises.

SCD Probiotics scdprobiotics.com

SCD Probiotics manufactures bio-based products for agricultural, industrial, and consumer applications. The company takes advantage of microbes as probiotics to manufacture fertilizers, supplements for livestock and honeybees, barn cleaners, manure treatment, microbial inoculants, and soil amendments for agricultural purposes.

Trilogene Seeds trilogenseeds.com

Trilogene Seeds, with a footprint in 29 countries across the globe, is increasing the efficiency of a farmer's growing operations with its feminized hemp seeds and cutting-edge cultivars, offering strains that adapt well to specific climates and photoperiods, with a boost from its specialized cultivation techniques.

ADAMA adama.com

With one of the most comprehensive and diversified portfolios of differentiated, high-quality products, and state-of-the art R&D, manufacturing and formulation facilities, ADAMA's reach farmers providing them with solutions to control weeds, insects and disease and improve their yields.

Bayer bayer.com

Bayer is a global enterprise with core competencies in the Life Science fields of health care and agriculture. Their products and services are designed to benefit people and improve their quality of life. Bayer's Climate FieldView™ is a unique platform that gives you the power to put your solutions in front of farmers across the country and around the world.

Corteva corteva.com

Corteva Agriscience™, brings the world's most recognized and premium agricultural solutions, featuring Pioneer® and Brevant™ Seeds, award-winning Crop Protection products, Encirca® and Granular® software tools and services. They provide agronomic support and services to help increase farmer productivity and profitability.

Marrone Bio Innovations marronebio.com

Marrone Bio Innovations strives to lead the movement to a more sustainable world through the discovery, development and promotion of biological products for crop protection and plant health. MBI's effective and environmentally responsible pest management solutions help customers operate more sustainably while uniquely improving plant health and increasing crop yields.

Valent BioSciences valentbiosciences.com

Valent BioSciences is a worldwide leader in the research, development and commercialization of biorational products for the agricultural, public health and forest health markets. Valent BioSciences offers a wide range of proprietary and environmentally compatible bioinsecticides that provide a strong and measurable return on investment.

AWARDS & RECOGNITION



Tyler Tuttle
Chief Commercial Officer

Kelly Tuttle
CEO



Richard Tuttle
CEO

COVER STORIES

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