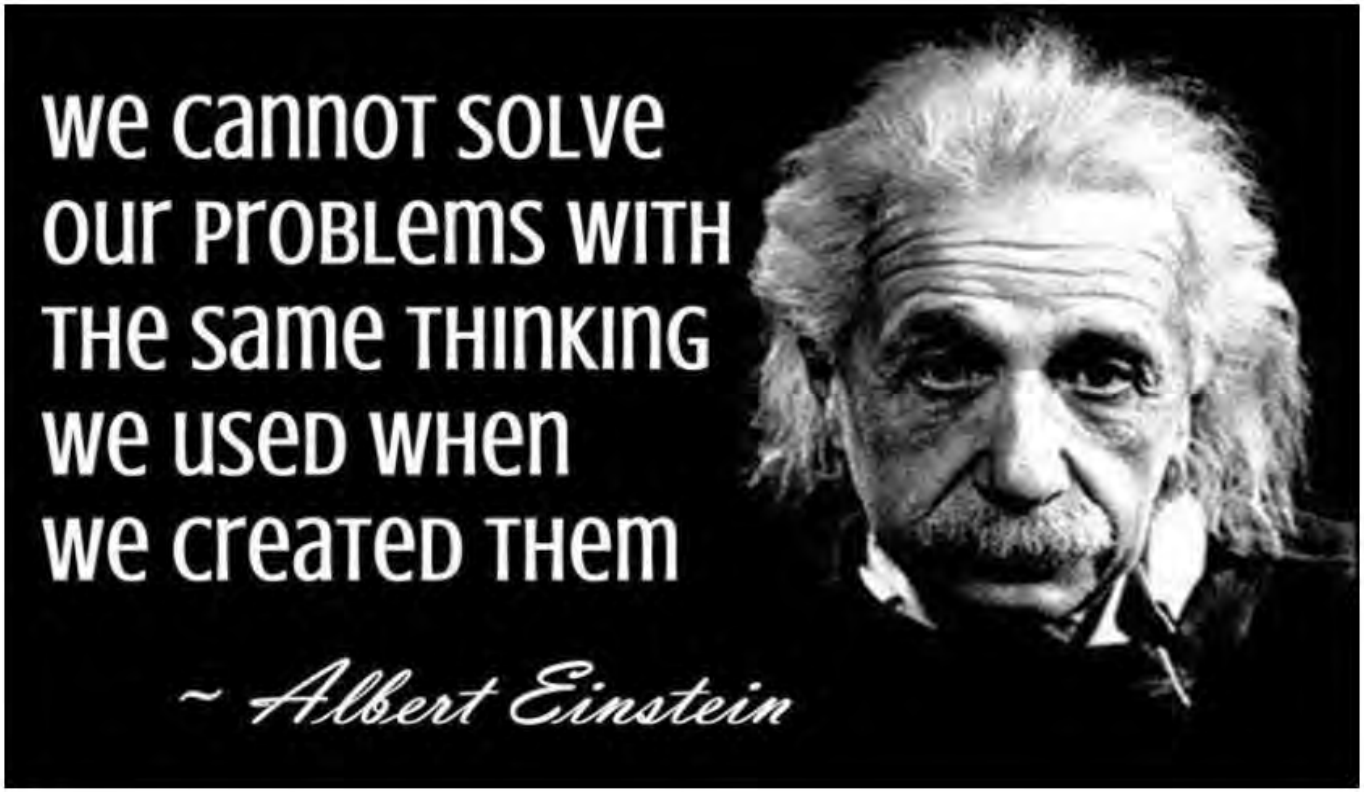
Organisan
corporation

Chitosan-Based Ag Products
Want MORE from every acre?



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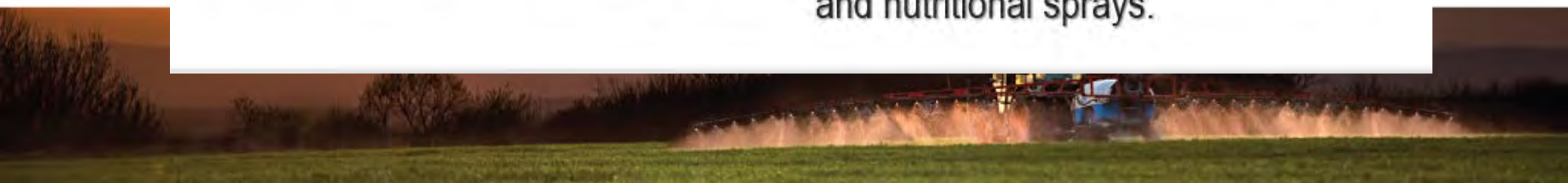
Introducing a new product line with revolutionary technology proven to greatly increase the efficacy of fungicides, fertilizers, herbicides, insecticides, and nutritional sprays.



Regenerative Agriculture

It can be difficult for farmers transitioning into a regenerative, biological, or organic system because the change can be a shock, both to the producer and the soil environment.

We fill a niche there and we often view ourselves as a bridge product to help producers stop fighting against nature and start working with nature.

We generally find though, that once producers realize the ROI and side benefits from using Organisan products they continue to use them.

Reference: Tom Wood Blog

www.OrganisanCorp.com

Chitosan-based product benefits

IMPROVE

The Health and Vigor of Your Plants

DECREASE

Transpiration Loss up to 50%

EXTEND

The Growing Season of Your Crops

See the difference OII-YS and Nemasan can make in your grove! South Texas - March 2021

Organisan corporation

Chitosan

What is it?
Where does it come from?
What does it do?
How does it work?
Why should I use it?

Primary Points

- Deacetylated chitin
- Shells of crustaceans, cell walls of certain fungi
- Plays a key role in transpiration
- Properties can act as a fungicide, nematicide, insecticide, plant elicitor, viralcide, and bacterialcide and more!

Chitosan- Nature's Building Block

How it works: Chitin is one of nature's building blocks, featuring prominently in the structures of a wide variety of organisms. Chitin, and far more importantly its derivative chitosan, offers tremendous benefits to agricultural professionals. If you look at the molecular structure of chitin, chitosan, and cellulose, they're very closely related; it's the same six-sided carbon-based molecule that much of nature is built upon. However, small differences can cause vastly different outcomes.

By converting chitin to chitosan ahead of time we gain a much more predictable and effective outcome. The next step in targeting the outcome is controlling the physical properties of the chitosan, and this control, along with the use of several other natural compounds, is what sets Organisan products apart in the marketplace, both as adjuvants and actives.

Chitosan has shown itself to be a very powerful fungicide but is unique in that it's selective.

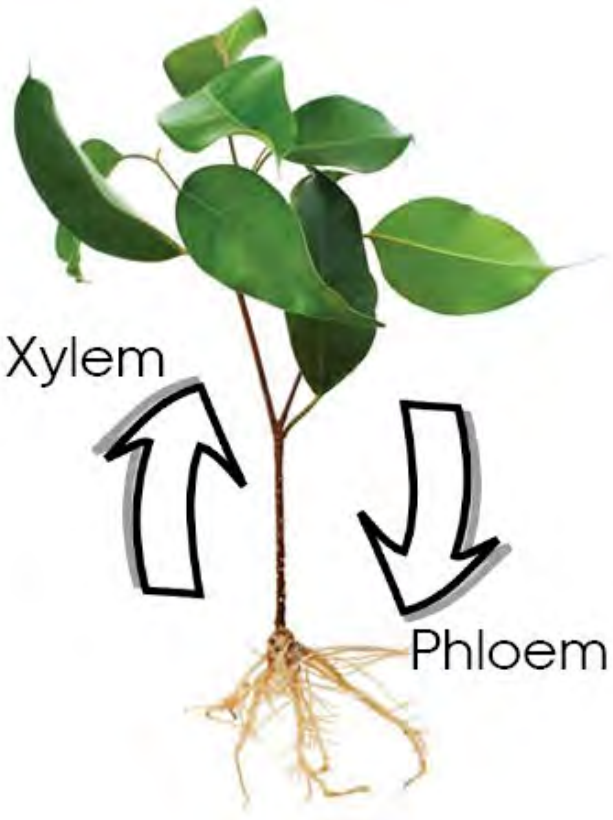
- It works against pathogens while at the same time becoming a food source for the beneficial microbes.
- It is a powerful trigger for the SAR/SIR response in plants and has shown to be effective in reducing transpiration rates and increasing frost tolerance.
- It's very effective in reducing root feeding nematode numbers, especially cyst type nematodes. Initial testing has shown a great benefit to the rhizophagy cycle, and MicroBiometer field testing has proven time and time again an improvement in soil biology.

Chitosan-what does it do?

- Triggers an SAR (systemic acquired response)
- Fungicide
- Bacterialcide
- Viralcide
- Insecticide
- Nematicide
- Plant Elicitor

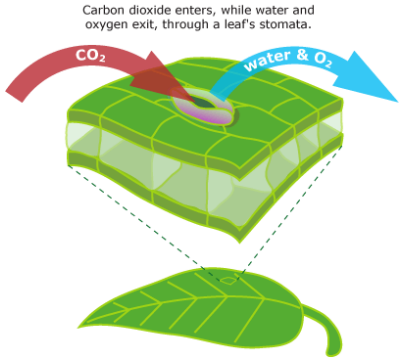
- Microbial stimulant
- Nutrient and mineral chelator
- Increase stomatal conductance-Transpiration control
- Increases photosynthetic rate
- Increases cold tolerance
- Wetting/sticking agent, this is improved with the addition of yucca and or quillaja
- Food preservative

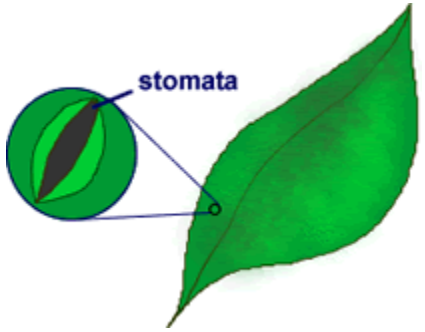
Transpiration- Key movement from plant to root



Key movement from plant to root

- Transpiration is the main process of water movement within plant tissues.
- Water is constantly transpired from the plant through its stomata to the atmosphere and replaced by soil water taken up by the roots.
- Transpiration assists the plant in absorbing nutrients from the soil as soluble salts.
- Chitosan enters the leaf and induces closure of the plant's stomata, resulting in decreased transpiration.
- Ask about our Transpiration Presentation for more details on this subject!





Fungicide

TWO-FOLD ATTACK

FOOD SOURCE FOR GOOD GUYS!

Binds to the plant fungal receptor, thereby initiating the SAR.

Permeates the cell structure, and accumulates at the exposed anionic plasma membrane, the damage done causes cell weeping. This membrane disruption is also thought to facilitate the uptake of many commercial fungicides, thereby increasing efficacy.

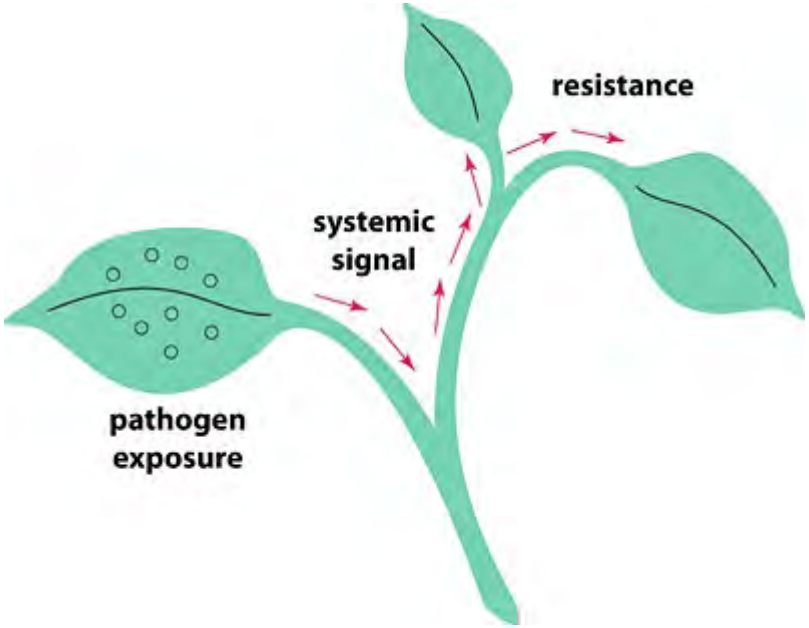
Due to the difference in cell structure between pathogens and beneficials, not only are the beneficials left unharmed by chitosan, but chitosan becomes a food source for them and stimulates production of chitinase enzymes from the beneficials. Thus creating a two fold attack against pathogens, using both direct and secondary modes of action.

Bacterialcide

- Triggers a SAR response.
- Works much the same as against pathogenic fungi, relying perhaps more on a electrostatic M.O.A.
- Causes morphological extra- and intracellular modifications, including cells with intracellular modifications, ie: irregularly shaped and without membranes or cell wall on one side.
- Disrupts the formation of bio films produced by pathogenic bacteria.
- Chelates certain nutrients and prevents the organism from accessing them.
- Certain molecular weights have shown high levels of efficacy against E. coli Staphylococcus, and Lactobacillus.
- Beneficial examples-Flavobacterium, Bacillus, Cytophaga, Pseudomonas, Clostridium, Streptomyces, Serratia

Viralcide

- Triggers a SAR response.
- Regulates the expression of resistance genes, in particular, induces jasmonate synthesis.
- Stimulation enhances cell wall lignification and phytoalexin synthesis.
- Works more to inoculate the plant against viral infection, rather than against the infection itself. An ounce of prevention is more effective than a pound of cure.



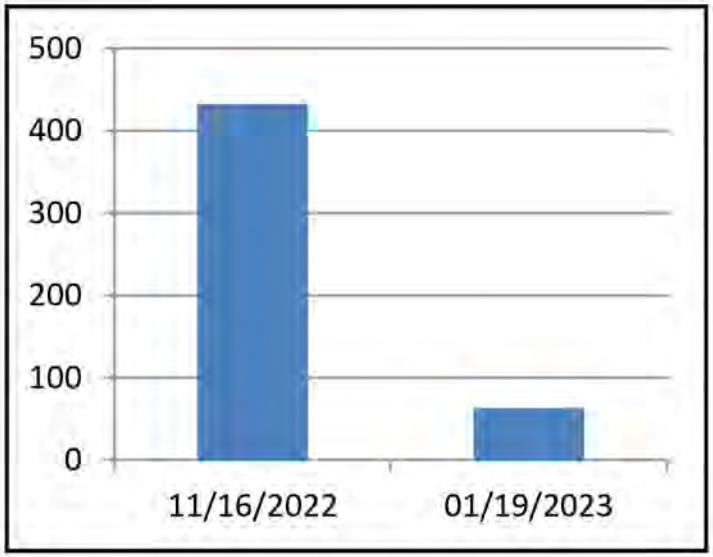
Nematicide/Insecticide

- Triggers a SAR response
- Stimulates production of chitinases by chitinolytic organisms, and the chitinases work to break down the chitin components of the attacker.
- Also works against the eggs of nematodes, as the cyst contains a high level of chitin.
- Works to increase Brix levels of the plant, thereby deterring predatory insects

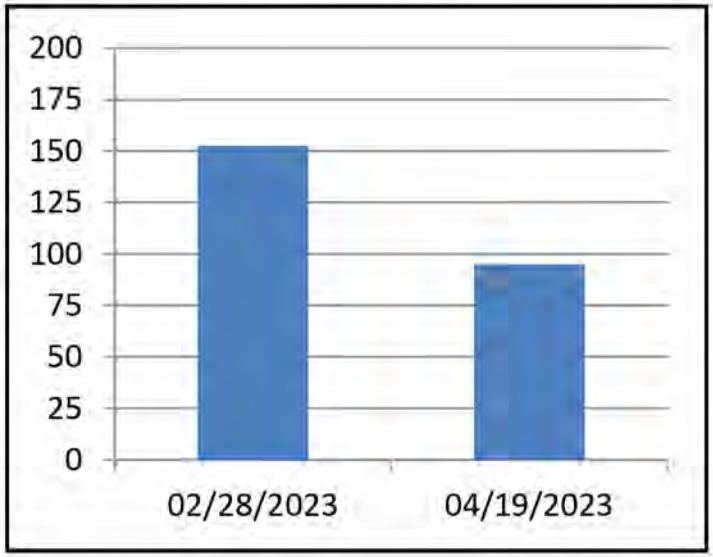
NEMATODE RESULTS

Root Knot Nematode
Florida Ferns 2022/2023
Nemasan Treatment Results

Seville, FL

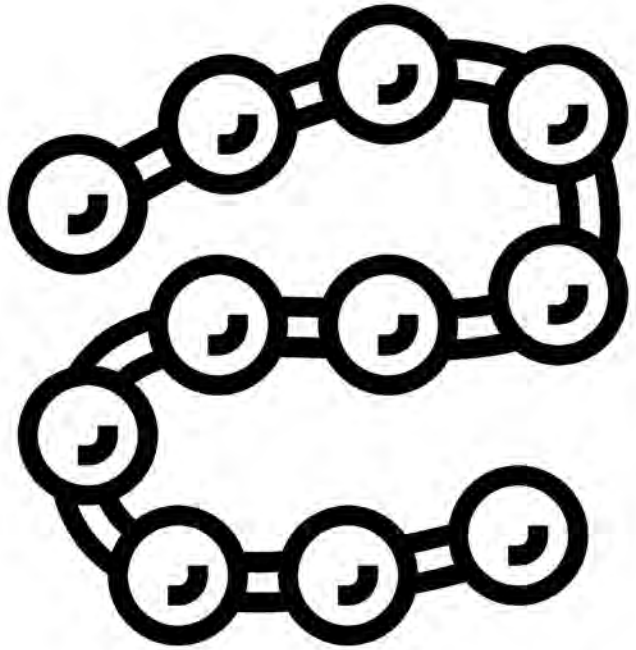


Pierson, FL



Plant Elicitor

The cellular and molecular changes elicitated by chitosan can be summarized in: membrane depolarization, oxidative burst, influx and exit of ions such as Ca2+, activation of MAP-kinases, chromatin and DNA alteration, increase in PR gene mRNA, PR proteins synthesis, phytoalexins accumulation, lignification and callose deposition.



Chitosan-how does it work?
Nutrient and mineral chelator

The strong cationic nature of chitosan forms bonds with molecules that are anionic in nature. This can be beneficial in a foliar nutrient spray, as well as working to prevent pathogens access to the nutrients.

Can also assist in the absorbtion and translocation of nutrients

Chitosan-anti transpirant

May influence pathways containing jasmonic acid. Jasmonates exhibit some activities similar to the plant hormone abscisic acid (ABA), which plays a key role in the regulation of water use by plants. Increased levels of ABA signal stomatal closure.

Stimulation of lignin production helps to strengthen stomatal guard cells.

Works to counteract the side effects of ethylene application to cereal grains.

Forms a “vapor barrier” coating on leaf surfaces.

Chitosan-how does it work? Freeze tolerance

Stimulating stomatal closure helps regulate water within the cell structure.

Aids in the movement of nutrients within the plant both xylem and phloem mobile.

Works against pathogens that promote ice crystal formation, ie: Pseudomonas syringae

Results May Vary, Sometimes Dramatically!

See the difference OII-YS and Nemasan can make in your grove! South Texas - March 2021

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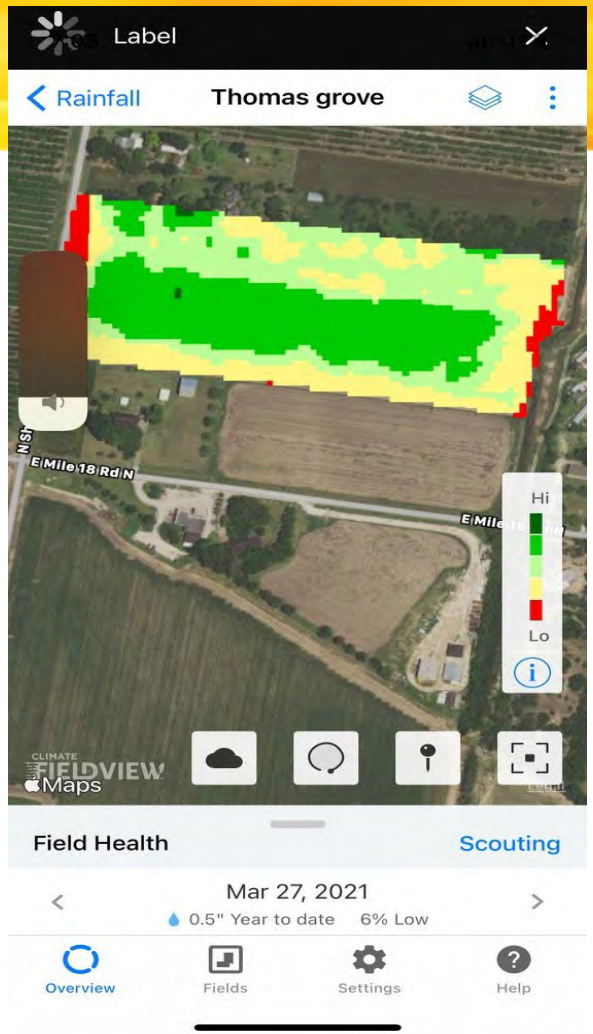


For more case studies, visit the Resources page at www.OrganisanCorp.com

Chitosan-how does it work? Wetting/sticking

Chitosan naturally forms into films

Electrostatic charge between the cationic condition of chitosan and the anionic condition of leaf surface.

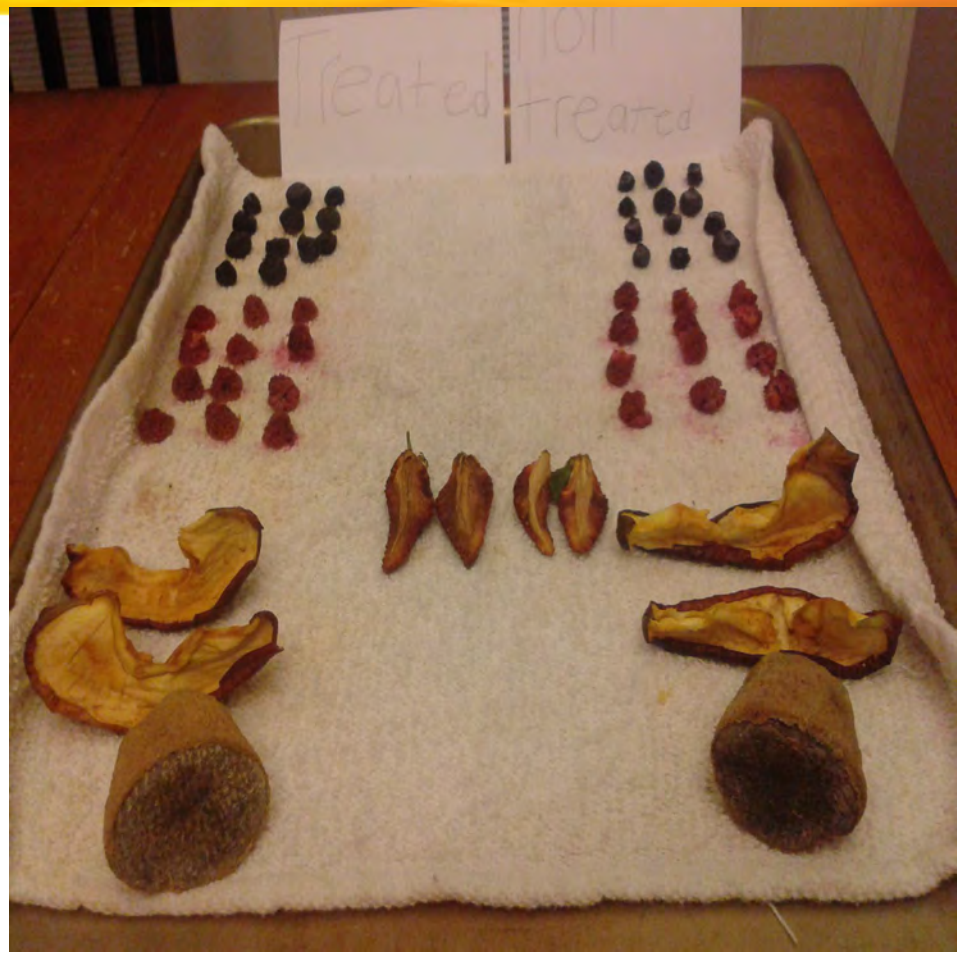
Yucca and quillaja being saponins, they naturally run and spread.

Chitosan-how does it work, food preservative

Forms a film around the product that prevents pathogen entry, slows oxidation, and thus helps maintain the internal environment of the product.

The saponin components-Yucca and Quillaja, in our formulations aids with the dispersion of the chitosan film. You consume these saponins on a regular basis already.

Chitosan-food preservative



Chickpea pathogen test

MONTANA STATE UNIVERSITY

Regional Pulse Crop Diagnostic Laboratory

P.O Box 173145, Bozeman, MT 59717-3145

406-994-5162, 406-994-7738; pulsediagnostics@montana.edu

Laboratory Report Of Analysis

Account No.	Date Received	Date Completed	Lab Number
1428	01/31/18	02/09/18	18-P2884

Treasure State Seed, Inc.
P. O. Box 698
Fairfield, MT 59436

Information Provided by Sender

Product	VNS
Kind	Chickpea
Genus/Species	Cicer arietinum
Lot Number	MC-17
Class	Service

Pathogens	Infected	Threshold	Above Threshold
Ascochyta	0.0 %	-N- %	--
Botrytis spp. (Grey Mold)	0.0 %	-N- %	--
Collectotrichum spp. (Anthracnose)	0.0 %	-N- %	--
Fusarium spp. (Fusarium wilt)	0.0 %	-N- %	--
Sclerotina spp. (Stem Rot)	0.0 %	-N- %	--
Stemphylium spp. (Stemphylium blight)	0.0 %	-N- %	--

Other Determinations

Status: Completed

Tests Requested: Ascochyta, Botrytis spp. (Grey Mold), Collectotrichum spp. (Anthracnose), Fusarium spp. (Fusarium wilt), Sclerotina spp. (Stem Rot), Stemphylium spp. (Stemphylium blight). No other tests requested.

This is not a bill. Please do not pay until we send you an invoice.

WARRANTY: We warrant that the purity and germination test results reported on this form have been carried out in accordance with AOSA rules unless otherwise specified. Test results reflect the condition of the submitted sample and may not reflect the condition of the seed lot from which the sample was taken.
DISCLAIMER OF WARRANTIES: WE MAKE NO OTHER WARRANTIES OF ANY KIND, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Signature:
Bright Agindotan, PhD, MBA, PMP
Lab Manager

96 Germ

Created on 02/09/2018 14:35:13

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SEE why you use a chitosan-based product!

Test Plot

Sugar beet side by side test

Wheat Roots from Tom Wood's Farm in 2017

2018 Potato

White beans side by side test

Minimum PPE Requirement

Treated vs. Untreated

OII-YS on Tomato/Leaf Curl Virus

**Results may vary and are not guaranteed. Test after test of various crops have shown when you use one of our adjuvants with your normal protocol of other treatments, the treated portion produces healthier plants and bigger and overall better yields.*

Treated vs. Untreated

Consistent results on treated areas include:

- Root Mass: The roots are tighter, bigger, fuller and longer in all areas of the root ball.
- Chlorophyll: The intensity of the green color in the plants stems is extremely evident.
- Stem Diameter: In side by side tests, producers noticed significant overall diameter and fullness of the treated. It's easy to see how the treated is getting proliferation of the stems as opposed to the untreated
- Overall Yield – Consistently larger and healthier than non treated areas

---

2018 Montana

Barley Field

Same Boy

Same Day

Treated – left

Untreated - right

Soybean Seed and Chitosan

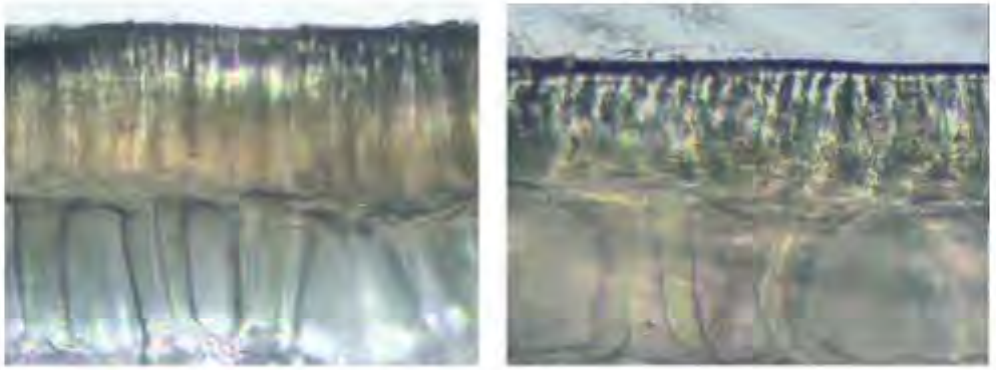
Want more information on Chitosan?

There are literally thousands of scientific studies from around the world available on the internet.

A quick google search on Chitosan and your crop will produce reports.

(a) Coated with NP (b) CK

FIGURE 1: Contrast section photos of soybean seedling growth coated with NP and CK.



(a) Coated with NP (b) CK

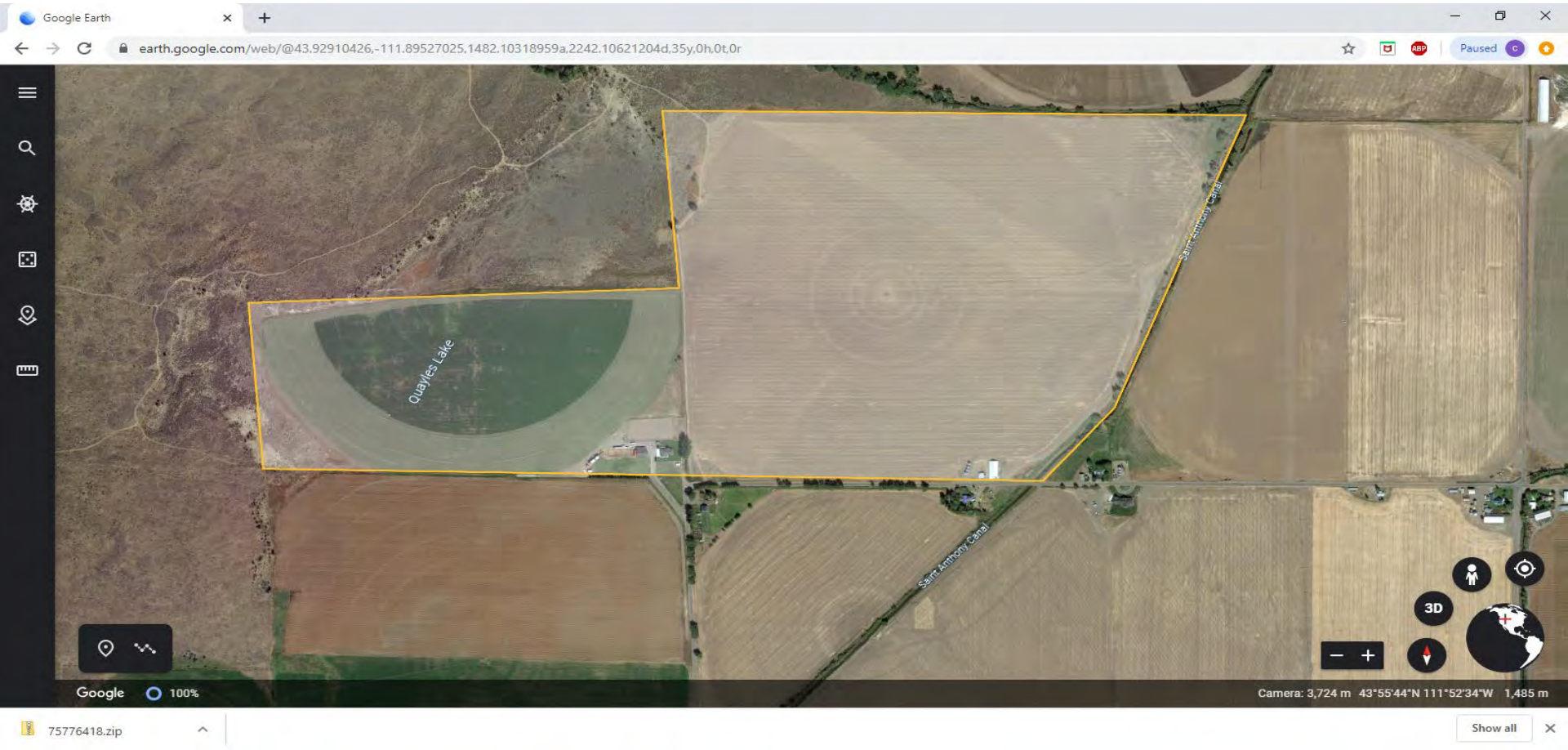
FIGURE 2: Contrast section photos of coated-seeds' and uncoated-seeds' surface membrane.

Source Hindawi Publishing Corporation, International Journal of Carbohydrate Chemistry
Volume 2012, Article ID 104565, 5 pages, doi:10.1155/2012/104565
Research Article **Application of Bioactive Coatings Based on Chitosan for Soybean Seed Protection**.

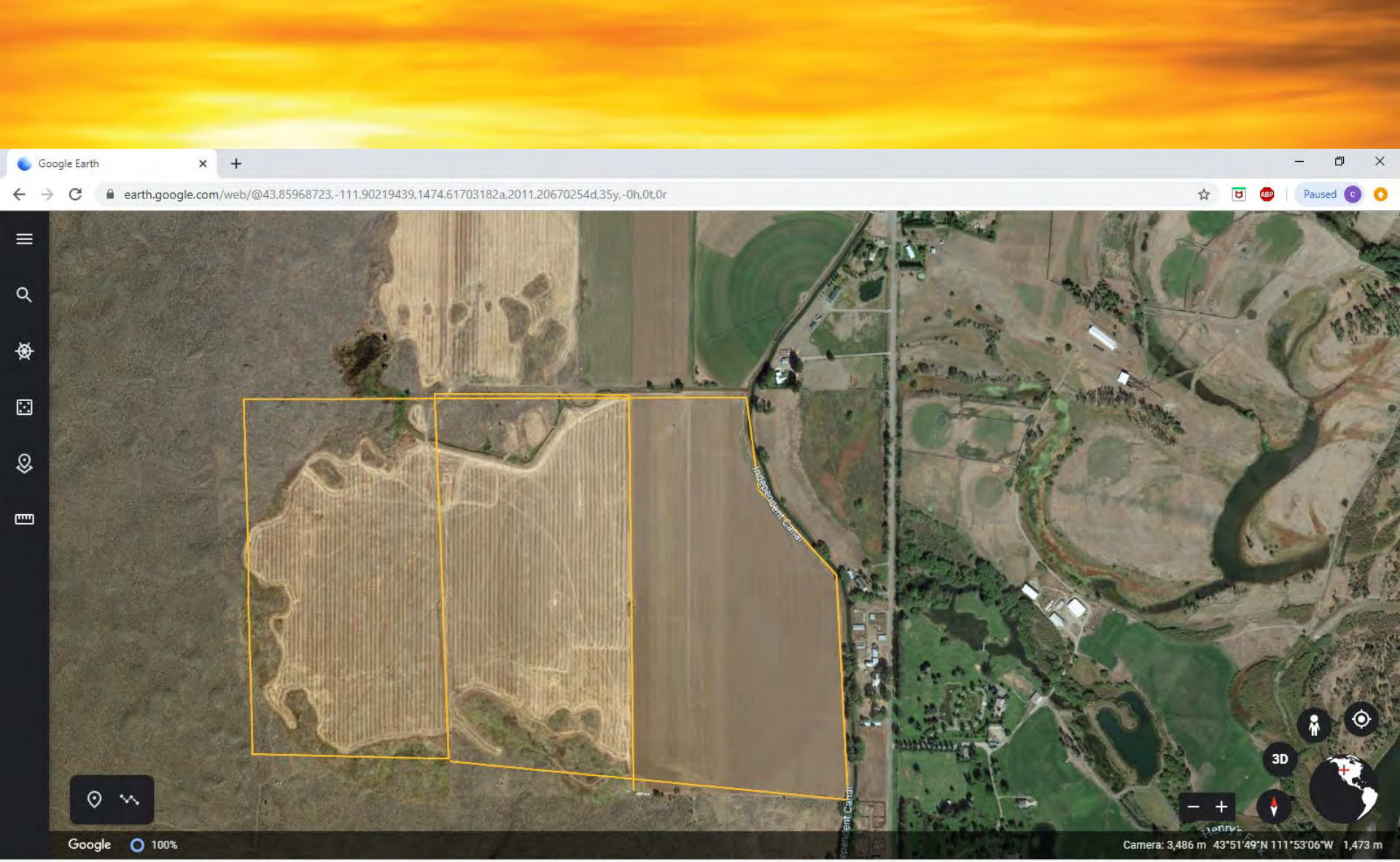
Testing microbial response with Microbiometer

61% Increase with 1 treatment

Phytophthora Erythroseptica
Aka Pink Rot



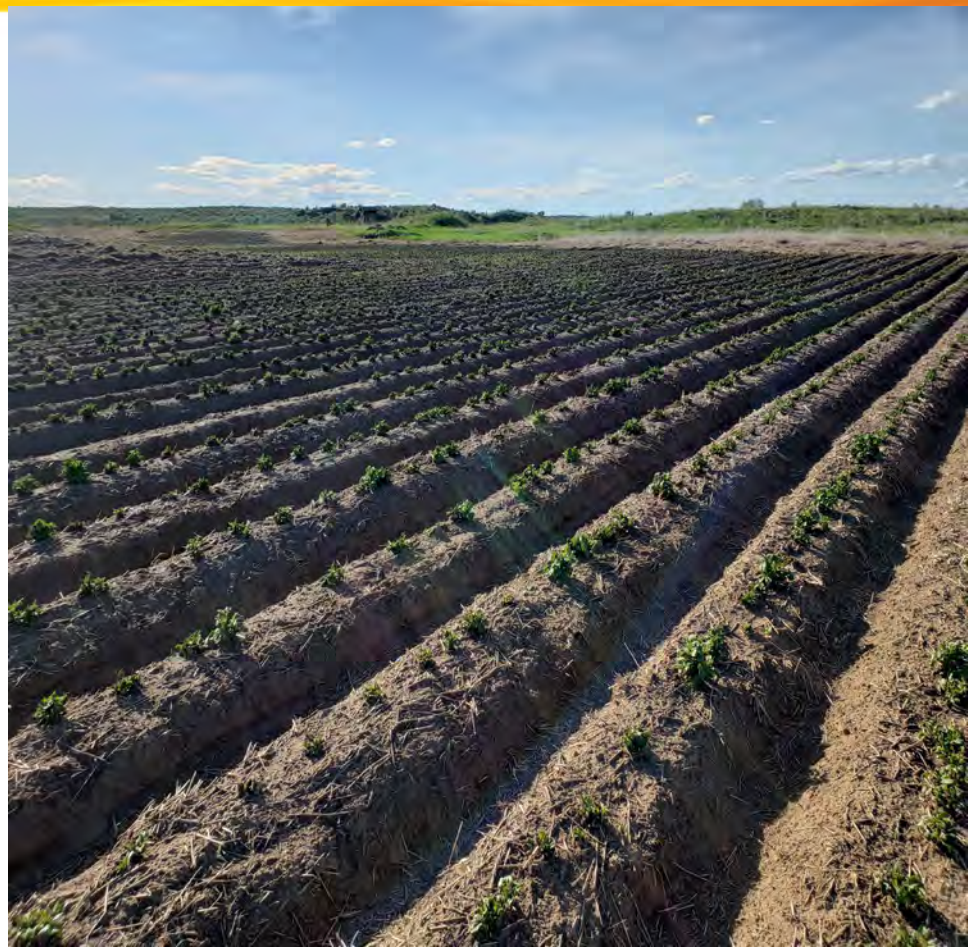
June 18 Stress Event


Google Earth
earth.google.com/web/@43.85968723,-111.90219439,1474.61703182a,2011.20670254d,35y,-0h,0t,0r
Paused
Independent Canal
3D
Google
100%
Camera: 3,486 m 43°51'49"N 111°53'06"W 1,473 m
75776418.zip
Show all

June 10 Stress Event

June 10 Stress Event

June 10 Stress Event



Stripe rust

Long leaf pine

Celery on the right received 1 pint p/acre of
O1-YS, impregnated into the chicken litter compost prior to spreading

New seeding grass

CitriSan: You must lower pH to 5.0 or below!

Lowering the pH to 5.0 or below with our products is critical. We offer CitriSan, to help.

* CitriSan supplied in convenient packets (40/ pail).
* About 1 packet to every 100 gallons (check rate with your local water conditions and spray mixes).
* Readily soluble.
* Compatible with all Organisan products.
* OMRI Listed® so it can be used in certified organic and conventional agriculture.

Believe the Unbelievable!™

We look forward to helping you MAXIMIZE RESULTS!

Organisan corporation

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John Hendrix: 601-383-3648
Tom Wood: 208-317-4580
Robin Borden: 601-624-4747