



# Neptune's Harvest

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## Atmospheric N-Fixing Azotobacter Products

The **BioNatural Blooming Blossoms**<sup>®</sup> line of N fixing products consists of three NOP products, two for soil and one for foliage. All contain multiple species of stabilized cyst Azotobacter for N fixation.

BioNatural **Bioplin** fixes N in both nitrate and ammonia forms in the soil. It is used in-row and/or after planting and emergence when root hairs are present. Bioplin feeds off root extrudates making N available for continuous, sustained uptake. BioNatural **NutriTech** is used in conjunction with Bioplin. NutriTech's primary function is to release phosphate. Since low P readings are the norm on 99% of the LaMotte (availability) tests coming through the CSI lab, we urge you to use both ground products as a starter package and get an increase in available P. BioNatural **NutriFoliar** fixes N on the leaf as well as supplies Vitamins B, C and E. B Vitamins are well known growth factors. Foliar N fixation has never been available before, so this represents a major breakthrough in plant feeding, as well as yield and quality potential.

**BioNatural Blooming Blossoms** products provide a grower with a valuable tool for taking the "ups & downs" out of a typical organic nitrogen cycle which always seems to be out of sync with the plant during its growth cycle. This is particularly true during the late season. Dr. Reams taught that if you could influence/feed a plant during the last 45-30 days, you would have the potential for almost doubling the yield. CSI believes the BioNatural technology has the potential to stabilize the N flow into a plant through the roots and then provide a steady supply from the leaf surface whenever used. CSI urges you to try the late foliar feeding of **NutriFoliar** with other appropriate nutrients such as Fish and seaweed and any other minerals determined to be needed by soil tests or plant tissue analysis. This will be easy for most high value crops as you are usually going through the fields of berries, grapes, apples and vegetables anyways. Field crops have benefited from both soil and foliar applications.

## NutriFoliar

### THE FOUR DIMENSIONAL FOLIAR

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**BioNatural Blooming Blossoms** products can function in soil pH's from 4.5 to 9.0; in temperature ranges from 32 degrees to 110 F and in very low to very high humidity. Products work best in 2% or more organic matter and when combined with fish and/or molasses. Programs have lead to increased yields on Corn of 24 – 45%, increased germination of 95-100% with N fixation in the 50-55 lbs/A range, have produced 49.5% increased dry matter yield in Wheat, 41% increases in Grapes, 45% increases in Strawberries and 38% increases with Apples.



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Apply **NutriFoliar** at 250ml/acre and in 20 to 50 gallons of water for thorough coverage of foliage. Reduce to 125 ml/A for third and subsequent foliar sprays. Because N can't be fixed without minute amounts of molybdenum **CSI urges the use of 2-4 gal fish and 1 pint seaweed for soil and 2-4 qts fish and 1 pt seaweed for foliar application to insure maximum N fixation.**

**NutriFoliar** is a complex, living fertilizer specifically designed for foliar applications. After a decade of extensive trials, the manufacturers and patent holders have been able to delineate a cost analysis which involves an average Investment-to-Benefit ratio of 1:5. This means that you get five times return on your investment.

In cropping situations, **NutriFoliar** is foliar-sprayed 30 days after germination and again 30 days later. The product offers four distinct modes of action, resulting in a complex, multi-dimensional growth response:

1. **NutriFoliar** contains fine tuned nitrogen-fixers, which utilize carbon exudates from the leaf surface to fix nitrogen from the atmosphere directly into the leaf. This is the first time that significant quantities of natural nitrogen have been supplied through microbial activity on the foliage.
2. **NutriFoliar** contains a range of beneficial bacteria that release natural growth hormones as metabolic by-products. These natural growth hormones are capable of generating powerful growth and yield response.
3. This unique foliar fertilizer contains species that produce vitamins, including the complete B group, Vitamin E and Vitamin C. Recent American research suggests that several of the B vitamins can act as growth stimulants, and Vitamins E and C are important for disease resistance.
4. **NutriFoliar** includes a range of organisms that can provide protection against disease. The explanation for this anti-fungal action is as follows:

\* Azotobacter secretes low-molecular substances that bind available iron and make germination of pathogenic fungi difficult (Iron is an essential ingredient involved in the trans-formation of an inactive spore to an active pathogen).

\* Azotobacter secretes an antibiotic with a structure similar to anisomycin, which is a documented fungicidal antibiotic.

\* Azotobacter, in sufficient numbers, will out-compete pathogens for food. Note: Some of the pathogens that have been controlled by Azotobacter in the soil and on the leaf include: Alternaria, Fusarium, Collectotrichum, Rhizoctonia, Microfomina, Diplodia, Batryiodiplodia, Cephalosporium, Curvularia, Helminthosporium and Aspergillus

(\*There is published research data related to the effect of Azotobacter on each of the above species – Google: Azotobacter pathogen control).

<http://arjournals.annualreviews.org/doi/abs/10.1146/annurev.py.26.090188.002115>

<http://mibr.highwire.org/cgi/content/abstract/71/3/413>

<http://cat.inist.fr/?aModele=afficheN&cpsidt=1095272>



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## Advantages of Using BioNatural Products:

- Provides significant amounts of Nitrogen in the form of ammonia, nitrates and amino acids without chance of over-dosage as N is not force fed – therefore the plant absorbs only what is necessary.
- Provides a stable source of N fixation – the plant grows at a stable rate and therefore stays much healthier. Supplements 30-55 lbs of N per acre.
- Multifold increase in plant root & shoot growth
- Helps plants better use their own root extrudates.
- Promotes plant growth & yield even in low phosphate soils.
- No inter-species competition, therefore there is no risk of contamination.
- Storage as dormant cyst preserves the full hormonal capacity.
- Substantial improvement in crop & plant quality
- 45% increase in fruit yields
- 50% increase in vegetable yields
- Less signs of Anthracnose and other fungal diseases
- Greatly improves nitrogen efficiency of compost
- **BioNatural Blooming Blossoms products can be used at any time of the growing stage.**