Rx Green Solutions

Efficacy Results: Harpin Proteins





Axiom Harpin Protein

- Harpin proteins are secreted by plant pathogens when they attack plants.
- These Harpin Proteins induce a localized hypersensitive response (HR) in the area of attack.
- This HR is mediated by a specific set of genes in the plant.
- Once "turned on" locally these genes create a cascade of effects which promote a Systemic Acquired Resistance (SAR) throughout the plant.





Product Pedigree

- Technology originated from Cornell University
- Cover of Science Magazine: 1992
- Endorsed by a variety of organizations:
- American Rose Society (Messenger® endorsement)
- Environmental Protection Agency (EPA) Approved
- Presidential Green Award: 2002
- 112 Domestic & International Patents (USA, Brazil, Japan and Western European Countries)
- Over a dozen patent pending filings
- Numerous Demonstrable Plant Benefits
- Plant Yield Increases
- Plant Health Increases
- Extended Shelf Life of Fresh Cut Plants











Axiom Harpin Proteins

- Axiom Harpin Proteins are a Plant Health Promoter and Plant Growth Stimulator that activates a plant's immune system activating growth and defense genes resulting in improved plant growth, increased yields, increased quality and extended shelf-life. Harpin Proteins are produced in nature by certain bacterial plant pathogens and plants have developed receptors on their seeds, roots, and foliage to detect the presence of Harpin Proteins. When Axiom is present, it triggers an "early warning system" resulting in increased plant yields and health.
- Harpin is approved and registered by the EPA and covered by over 100 Domestic and International Patents





Harpin Results Overview

Multi-year commercial, university and replicated field trials results include:

- Row Crops Yield Increase: Increased yields from 8% 20% in row crops
 - Corn: +7 Bushels per acre
 - Cotton +65 +70 lbs per acre
 - Soybeans +2.5 bushels per acre
 - Wheat +2.9 bushels per acre
- Vegetable Crop Yield Increase: Increase yields from 10% 30% in vegetable crops (tomato, pepper, cucurbit, strawberry and peach, etc.)
 - Tomato: +120 +140 boxes per acre
 - Pepper +100 +120 boxes per acre
 - Watermelon / Cantaloupe 10% 30% increase in marketable
 - Strawberries +15% by count, +30% by weight
- Nematode Reduction: Reduces nematode populations by 50% or more
- Increased Shelf Life: Increase shelf life and storability of fresh cut vegetables from 3 7+ days



Row Crops





Soybeans +2.5 bushels per acre





Field & Sweet Corn

Corn: +7 Bushels per acre









Cotton +65 – +70 lbs per acre





Russet Burbank Potatoes

Russet Burbank Potatoes Images and Infrared



Treated Area, Darker = Higher Yield



Altura Potatoes

Untreated Alturas

Harpin $\alpha\beta$ Treated Alturas





Altura Potatoes

 6 random samples were pulled from the treated and untreated fields. Samples contained the same number of plants, since the treatments were made too late to influence stand.
"Field Yield" is the actual per acre yield from the grower, which includes field effects in addition to treatment effects.



Trial 212036 – 2 apps of Harpin (@ 2 oz) via chemigation



Alfalfa



Average of 209016, 209017, 209018, 209019, 209020: Harpin applied @1 oz/acre at 14 days before 1st cutting ("1X1"), 14 days before 1st & 2nd cutting ("1X2"), or 14 days before all 3 cuttings ("1X3").



Snap Beans





Winter Wheat

Harpin applied to highlighted section











Tomatoes

Tomato Yield Increases

- Tomato: +120 +140 boxes per acre (10 15% increase)
- \$60+ per acre increase of saleable
- 2:1 ROI





TREATED *** AXIOM

UNTREATED







Tomatoes

Tomato Yield Increases





Peppers

Pepper Yield Increases

+100 - +120 boxes per acre (10 - 50% increase)





Two Pepper plants grown in the same pot, under exact same conditions, except the plant on the right used Axiom. Image taken 5 days (7/25/12) after first application



Melons







Watermelon Yield Increases



Trial 3200, by 6L's Farm. Variety 'Fiesta'





Cucumber Yield Increases



Trial 3201 by 6L's Farm. Variety 'Slice Mor





Lettuce Varieties Yield Increases







Lettuce Yield Increases





Sheppard Farms, Cedarville, NJ





Lettuce Root Yield Increases





Sheppard Farms, Cedarville, NJ









Blueberries

Treated had not been treated in two years

Farmer noticed a major difference in rows and took pictures





HARPIN PROTEINS Increase Shelf Life





Assessment made 23 days after harvest









Lettuce Shelf Life Evaluation







Lettuce Shelf Life Evaluation

Percent Marketable Heads after 7 days at Room Temperature





Spinach

Spinach Shelf Life Evaluation

Spinach after 7 days in chilled storage (Average of 5 degrees C)







Harpin Shelf Life Data

Strawberry Shelf Life Evaluation



Control- 20% rots developed at 20°C over two weeks Axiom- 8% rots developed at 20°C over two weeks





Harpin Proteins are Healthy & Safe!

Easy to use, Just Mix and Spray!

- Harpin Proteins are environmentally safe and virtually non-toxic!
- They will not harm your pollinators
- Or your family pets









Axiom Applications

- 2gram packet mixed with 1 gallon of water (2oz option available)
 - 1 gallon covers 1,000 square feet
 - Re-seal opened packets to minimize exposure to air and moisture; use opened packets within 3 weeks
 - Maintain tank pH between 5-10
- Plants can be sprayed, fogged, drenched, or dipped
- Axiom is compatible with a wide range of other products
 - Always mix Axiom first, then add other products
 - Do not use with oxidizing agents
- Always read labels prior to use



