

BIO HUMANETICS Incorporated

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2017

THE SOLUTION

A Quarterly Publication by
BIO HUMANETICS, Inc.

BHN and Mesa Verde Resources Form Strategic Alliance



Bio Huma Netics, Inc. (BHN) has recently formed an alliance with Reid Enterprises LLC, which does business as Mesa Verde Resources in New Mexico. Mesa Verde Resources is a humic substance mining company that produces, manufactures, and sells humic-acid and fulvic-acid products.

Other than access to a greater range of products, customers from the two companies should see little change in day-to-day operations. There will be no

immediate change in personnel at either company, and the two companies will continue to operate separately under separate names for the immediate future.

This alliance is expected to facilitate a synergistic relationship between the BHN lines of agriculture, turf, and wastewater/soil remediation products and the Mesa Verde Resources line of humic and fulvic acid products for both domestic and international markets. While BHN has previously focused on a sub-fraction of humic substances to create its proprietary Micro Carbon Technology® used as a base for all its liquid products, the combined company will now offer its customers an even greater selection of both dry and liquid products that includes MVR's various humic and fulvic acid products.

Bio Huma Netics has averaged over 20% growth per year over the last 10 years. With the Mesa Verde alliance, combined company sales are expected to increase by 30% in 2017.

About Mesa Verde Resources: Mesa Verde Resources (MVR) mines and manufactures high-quality New Mexico humates, with humic and fulvic acid products including granular products, powders for solution and suspension, and liquid humic and fulvic acids. MVR humates—mined from the Fruitland Formation of the San Juan Basin in Northwest New Mexico since 1975—are used extensively to increase crop quality and production and to improve and replenish depleted soils. Learn more at www.humates.com.

BHN History Video Now Available



This short video narrated by Lyndon Smith, current President/CEO of BHN and son of founder Dr. Jordan Smith, tracks the history of BHN from its founding as Sunburst Mining Company in 1973 to the present. The founders developed a proprietary process to extract organic acids, valuable minerals,

and other organic components from a unique oxidized humate from a company-owned mine in Idaho. This extract contains the base of Micro Carbon Technology® that is the foundational ingredient used in almost all of the more than 70 products produced by BHN.

In This Issue . . .

We love to hear stories from the people who use our products, and a number of those stories are included in this issue of *The Solution*. We begin with a report from Holden Research and Consulting on how use of certain Huma Gro® products on strawberries led to an ROI of over \$3,400/acre. Amazing! Equally amazing is a report from Plant Sciences showing how effective Promax® is at controlling 8 strawberry pathogens. It seems that Huma Gro® and strawberries have an affinity for each other.

On the back page we share some videos out of Colombia, South America, from postings to the Huma Gro® groups on WhatsApp. Any story that involves a mule has got to be interesting, and the video showing hand foliar application of Breakout® on rice from San Jacinto del Cauca does not disappoint.

Since such a large percentage of our customers are from Spanish-speaking countries, we have launched a Spanish version of our Huma Gro® blog at <https://humagro.com/category/espanol/>. We hope to use this blog to bring even more people into the Huma Gro® conversation.

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Huma Gro® Program Increases Strawberry Yields 13%, With an ROI > \$3,400/acre

Field Report

Conducted by: Holden Research and Consulting

Huma Gro® Products: Vitol®, Breakout®, Super Phos®, Super Nitro®, Calcium, Super Potassium™

Objective

This field trial assessed the effects of an additional 4 foliar applications of Huma Gro® products on the yield of Portola strawberries when compared with the grower's standard crop nutrition program.

Materials & Methods

This trial was set up in a complete randomized-block design conducted during the growing season of July 18 through November 28 in Ventura County, Calif. Two treatment programs were compared: Treatment 1 was the grower's standard nutrition program of controlled-release fertilizer applied at planting and in-season applications of N-P-K; Treatment 2 was the grower's standard plus varied combinations of Huma Gro® products applied foliarly at 4 points during the growing season:

- September 5: 1 pint/acre each of Vitol®, Breakout®, Super Phos®
- September 26: 1 pint/acre each of Vitol®, Super Phos®, Super Nitro®
- October 17: 1 pint/acre each of Vitol®, Super Nitro®, Calcium
- November 7: 1 pint each of Vitol®, Calcium, Super Potassium™

The strawberries were picked 16 times during the growing season, and measurements were made at each picking with results calculated cumulatively of trays picked per acre, marketable utilization of berries, yield (by weight), and price paid per yield.

Results

As can be seen in **Figure 1**, Treatment 2 (Huma Gro®) produced the most trays of picked strawberries (10 lb equivalent), with a cumulative total of 2,243.6 trays per acre equivalent, compared with Treatment 1 (Grower's Standard) of 1992.8 trays per acre, a 13% yield increase for Huma Gro®.

Figure 2 shows the daily market utilization for the berries picked during the season (the percentage of marketable berries from the total weight of berries picked), with Treatment 2 (Huma Gro®) resulting in 76% utilization and Treatment 1 (Grower's Standard) reaching only 70%. This represents over 3,000 additional pounds of berries per acre that can be sold due to Treatment 2 (Huma Gro®).

No problems with phytotoxicity (leaf burn) were noted with the use of any of the foliar-applied Huma Gro® products.

Conclusion

Based on the data collected in this trial, the Huma Gro® treatment program resulted in both higher yields and a higher percentage of marketable yield, resulting in an overall **yield increase of 13%** over the Grower Standard. This yield increase resulted in a return-to-the-farm increase of almost **\$3,500 more per acre**, a **14% increase in dollars back** to the farm (see **Figure 3**). Factoring in the cost of the additional Huma Gro® products applied to achieve this yield increase, the return on investment (ROI) was calculated to be **8,226%**.

It is recommended that in future trials the Huma Gro® product combinations be foliarly applied at 2-week intervals and alternate Vitol® and Breakout® in the product mixes.

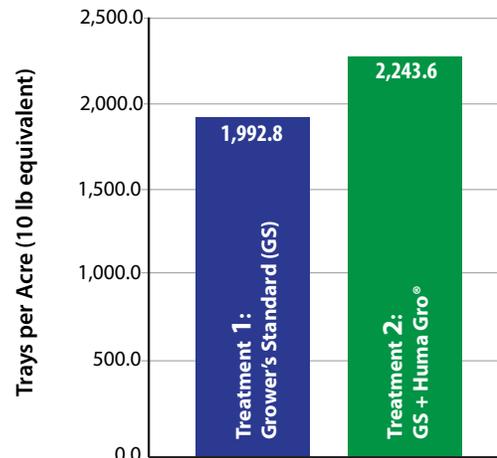


Figure 1. Total Strawberry Trays Yield per Acre, Grower's Standard (GS) vs. GS + Huma Gro®

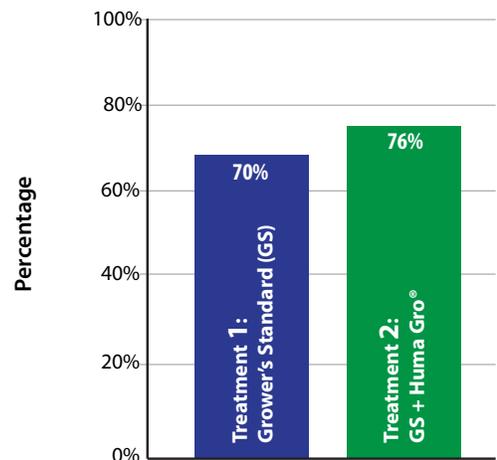


Figure 2. Percentage Strawberry Yield Marketable Utilization, Grower's Standard (GS) vs. GS + Huma Gro®

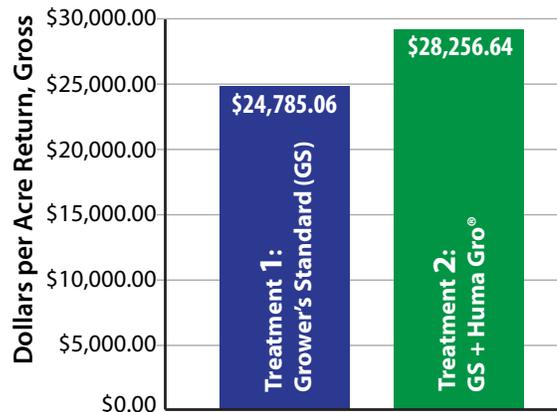


Figure 3. Total Strawberry Yield Gross Return (\$/Acre), Grower's Standard (GS) vs. GS + Huma Gro®

In Vitro Bio-Assay Testing of PROMAX® Efficacy in Controlling Strawberry Pathogens

Lab Report

Plant Sciences, Inc.

Objective

Test the efficacy of Promax® for inhibiting mycelial growth of 8 fungal strawberry pathogens through *in vitro* bio-assay.

Methods

Potato dextrose agar was amended with Promax® at a rate of 2% after autoclaving and cooling to 55°C on a stir plate. The amended media was poured into Petri plates and, once cooled and solidified, they were inoculated with 8 economically important strawberry pathogens (see list, below). Plates were inoculated by placing a 5 mm mycelial agar plug, taken from actively growing culture, onto the center of the amended media. Non-amended agar plates were also inoculated as a negative control treatment. For each treatment by pathogen combination, three replicate plates were inoculated. The plates were incubated at 20°C for 2 weeks. The diameter of each mycelial colony was measured weekly. The % inhibition by the test chemical was calculated using the difference between the mean of replicates in the negative control group and the treated group.

The following 8 fungi and fungal-like pathogens were tested:

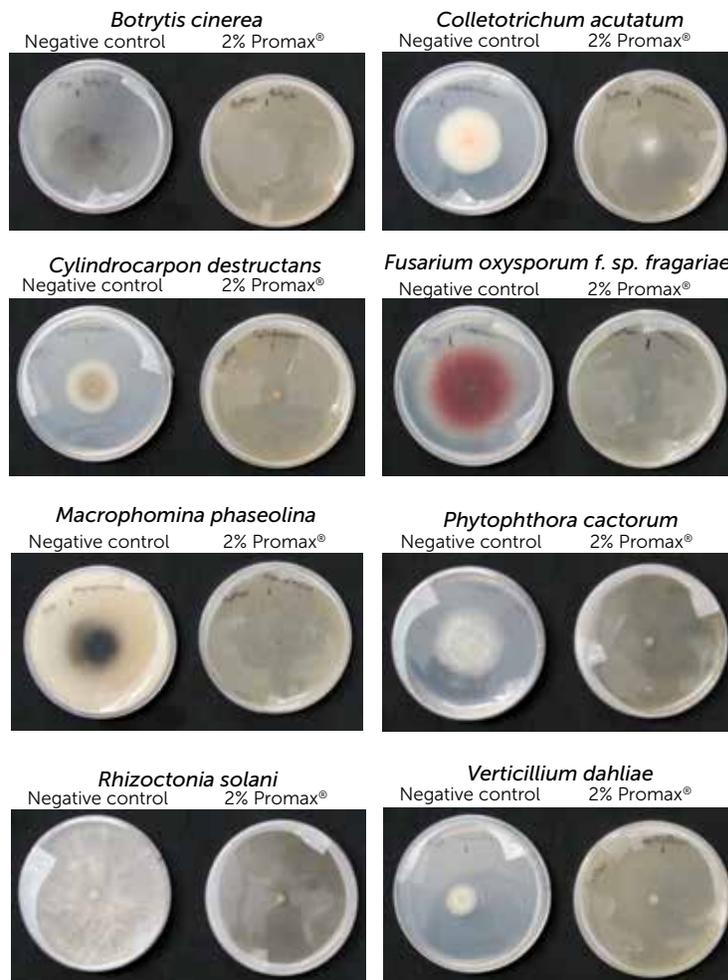
- *Botrytis cinerea*
- *Colletotrichum acutatum*
- *Cylindrocarpon destructans*
- *Fusarium oxysporum f. sp. fragariae*
- *Macrophomina phaseolina*
- *Phytophthora ramorum*
- *Rhizoctonia solani*
- *Verticillium dahliae*

Results

After 1 week of incubation, all 8 pathogens tested were completely inhibited from mycelial growth in media amended with 2% Promax® (see photos, next column). After 2 weeks, 7 of the 8 pathogens were still 100% inhibited. *Verticillium dahliae* began to grow a little after 2 weeks; the mean percentage inhibition of *V. dahliae* was 94% after 2 weeks.

Conclusions

Promax® was highly effective in *in vitro* control of these 8 strawberry pathogens.



New On the BHN Hub

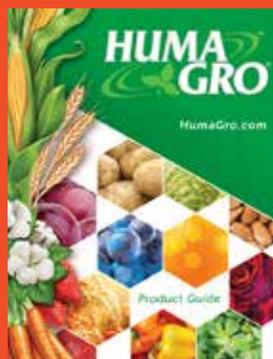
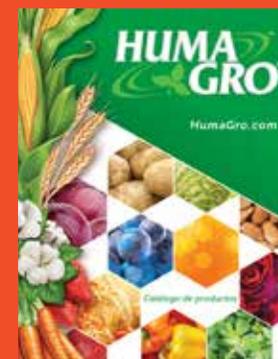
If you are a customer or distributor of HUMA GRO®, HUMA GRO® TURF, or PROBIOTIC SOLUTIONS® products, register for BHN Hub membership (<http://bhn.us/member-registration/#>). Membership will give you access to product documents and updates, as well as research and field study reports.

Here are some recent Huma Gro® updates:

- Updated English and Spanish Safety Data Sheets (SDSs)
- Added 3 Huma Gro® White Papers: *Micronutrients Are the Key to Better Yields*, *The Value of Humic Substances in the Carbon Lifecycle of Crops*, *Saying Goodbye to Soil Fumigants*

2017 Huma Gro Catalog Released in English and Spanish

The newly redesigned catalog contains specific information on 45 Huma Gro® liquid crop nutrition and protection products in the categories of Primary Macronutrients (9), Secondary Macronutrients and Micronutrients (14), Optimal Growth Management (8), Sustainable Soil Fertility (5), Carbon-Rich Organic Acids (5), Zero-Residue Crop Protection (2), and Specialty Products (2).


 Click to view **English**

 Click to view **Spanish**

2017 Huma Gro® Turf Product Catalog Released

The updated 2017 Huma Gro® Turf product catalog contains specific information on 39 Huma Gro® Turf liquid nutrition and turf protection products in the categories of Primary Macronutrients (10), Secondary Macronutrients and Micronutrients (11), Optimal Growth Management (6), Sustainable Soil Fertility and Surfactants (6), Carbon-Rich Organic Acids (4), and Zero-Residue Turf Protection (2).



In addition, the new catalog provides 16 updated turf specialty programs to address specific needs such as overseeding, heat stress, fairy ring, greens and fairway color, and tournament prep.

Huma Gro® Turf products are formulated with a proprietary Micro Carbon Technology® that provides an ultra-efficient delivery system for precision nutrition to create premium turf. In addition, Huma Gro® Turf products have a positive

environmental impact by promoting overall soil and plant health through efficient foliar nutrition and the growth of roots and beneficial microorganisms in the soil.

The 2017 Huma Gro® Catalog is available to [view online](#) or as a [downloadable PDF](#). Print copies of the catalog are available from Huma Gro® Turf distributors or Sales Representatives upon request.

Turf Specialty Programs

GREENS			THATCH CONTROL		
Product Mix	Per 1,000 ft ²	Per 100 ft ²	Product Mix	Per 1,000 ft ²	Per Acre
BREAKOUT™	3.02	100 mL	Water	5 gal	50 gal
TURF IRON™	3.02	100 mL	FERTIL HAMB®	2.02	2.02
MULTI-PURPOSE™	3.02	100 mL	TURFLEX™ IV	3.02	1 gal
TURFLEX™ III	3.02	100 mL	SURF-AMAX™	1.02	1.02
WATER CONSERVATION			SALT CONTAMINATION		
Product Mix	Per 1,000 ft ²	Per Acre	Product Mix	Per 1,000 ft ²	Per Acre
SURF-AMAX™	0.5-0.75 oz	24-32 oz per 80 gal	Water	5 gal	50 gal
FERTIL HAMB®	2.02	2.02	ENCAPSALT™	2.02	2.02
MULTI-PURPOSE™	2.02	2.02	SURF-AMAX™	1.02	1.02
FAIRWAYS			FAIRWAY COLOR		
Product Mix	Per 1,000 ft ²	Per Acre	Product Mix	Per 1,000 ft ²	Per Acre
CURIOUSITY™	0.02	2 gal	BREAKOUT™	2.02	2.02
BREAKOUT™	2.02	2.02	TURF IRON™	3.02	1 gal
TURF IRON™	3.02	1 gal	MULTI-PURPOSE™	2.02	2.02
TOURNAMENT PREP			ROOT DRIVER		
Product Mix	Per 1,000 ft ²	Per Acre	Product Mix	Per 1,000 ft ²	Per Acre
BREAKOUT™	0.02	1 gal	SURF-AMAX™	0.5-0.75 oz	24-32 oz per 80 gal
TURFLEX™ IV	3.02	1 gal	BREAKOUT™	3.02	1 gal
TURF GREENS™	3.02	1 gal	FERTIL HAMB®	2.02	2.02
MALFAM™	2.02	2.02	MULTI-PURPOSE™	3.02	1 gal
MULTI-PURPOSE™	3.02	1 gal	ZAP™	6.02	6.02

MICRO CARBON TECHNOLOGY

Products contain Micro Carbon Technology®, a proprietary blend of very small organic molecules that allow for more effective absorption of nutrients by plants.

More information about Huma Gro® Turf products and the value of becoming a Huma Gro® product distributor is available at www.humagroturf.com.

Sample Catalog Page Showing 8 of 16 Turf Specialty Programs: Click on Image to View Online

Huma Gro® Turf Special Turf Programs

Turf management is a never-ending series of problems to be solved. We've developed this series of 16 Special Turf Programs to help turf managers deal with their most common turf problems: from Black Plug Layer to Fairy Ring, from Overseeding to Water Conservation, we have a HUMA GRO® TURF solution for you!

- [Black Plug Layer Special Turf Program](#)
- [Chemical Toxicity Special Turf Program](#)
- [Fairway Color Special Turf Program](#)
- [Fairways Program Special Turf Program](#)
- [Fairy Ring Special Turf Program](#)
- [Greens Program Special Turf Program](#)
- [Heat Stress Special Turf Program](#)
- [Heavy Traffic Special Turf Program](#)
- [Hydraulic Spills Special Turf Program](#)
- [Overseeding Special Turf Program](#)
- [Recovery & Repair Special Turf Program](#)
- [Root Driver Special Turf Program](#)
- [Salt Contamination Special Turf Program](#)
- [Thatch Control Special Turf Program](#)
- [Tournament Prep Special Turf Program](#)
- [Water Conservation Special Turf Program](#)

Research reports describing the effectiveness of Huma Gro® Turf products can be found at <http://humagroturf.com/case-studies/>.

Case Study

Reducing Sludge using BIO ENERGIZER®

Location: New Mexico Small Municipal Wastewater Treatment Facility

Problem

A small town in New Mexico (pop. 1,300) had a municipal wastewater system with a flow rate of 50,000 gallons per day. The system included a series of three lagoons that tapered to a depth of 13 feet. Pond 1 had an average sludge depth of 1.9 feet, Pond 2 averaged 3.5 feet, and Pond 3 averaged 2.7 feet. The system was in need of reducing the sludge in its lagoon wastewater system to meet state requirements. Dredging costs were more than the town could afford, and an alternative method for dealing with sludge accumulation issues was needed.

Solution

A 6-month test (later extended to 300 days) was developed in which BIO ENERGIZER® was administered to make nutrients more available to wastewater microorganisms, thereby stimulating natural sludge reduction. The test initially involved treating Pond 1 at a dosage of 7 ppm; however, during the treatment period the system operator determined that it would be very beneficial to treat both Pond 1 and Pond 2, as the lagoon system had historically utilized Pond 2 more than Pond 1. The dosing amount was split between the two ponds, so that 2 ppm was administered to Pond 1 and 3 ppm was administered to Pond 2. After 6 Months 1 ppm was administered to Pond 3 to facilitate greater sludge reduction. Sludge-judging occurred monthly and sludge levels were tracked at 9 collection points across 3 cross-sections to follow the reduction of sludge in each system.

Resolution

At 10 months the average sludge depths of the ponds were found to have continually reduced: Pond 1 from an average depth of 1.9 feet to 1.6 feet, a 12% reduction; Pond 2 from an average depth of 3.5 feet to 2.3 feet, a 36% reduction; and Pond 3 from an average depth of 2.7 feet to 2.1 feet, a 24% reduction. The cumulative effect was demonstrated when the focus of treatment changed from Pond 1 to Pond 2 and Pond 3. Based on the progressive reduction of 300 days, it is estimated that there will be a continuation of sludge reduction with continued use of the product. By reducing the accumulated solids in its lagoons, the town is regaining lost capacity to better handle the incoming flow and meet its permit requirements without dredging.

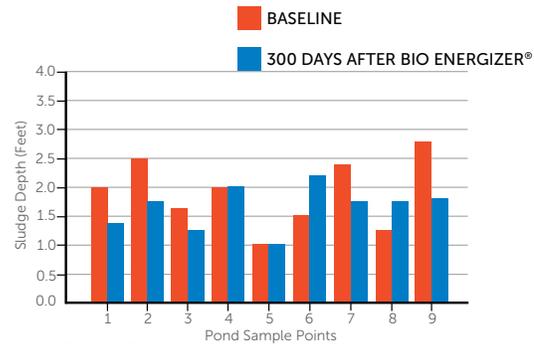


Figure 1. **Pond 1** Sludge Depth (in feet) at Baseline (red) and 300 Days (blue), 9 Sample Points

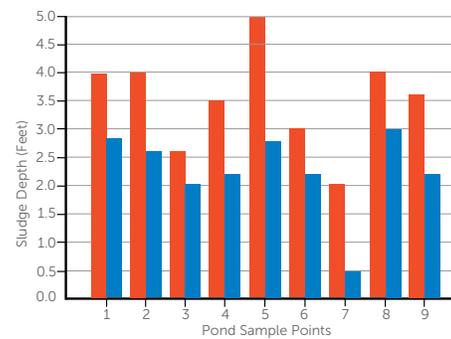


Figure 2. **Pond 2** Sludge Depth (in feet) at Baseline (red) and 300 Days (blue), 9 Sample Points

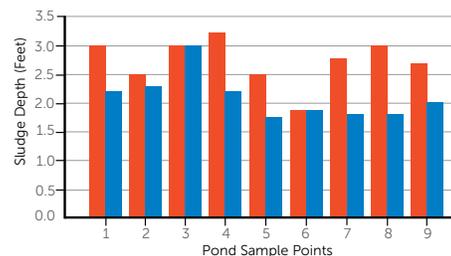


Figure 3. **Pond 3** Sludge Depth (in feet) at Baseline (red) and 300 Days (blue), 9 Sample Points

Product Information

Probiotic Solutions® BIO ENERGIZER® is a formulation of nutrients, organic acids, natural biological stimulants, and energy systems that balance the natural microbial ecosystem to increase bio-oxidation capacity in lagoon systems. BIO ENERGIZER® is a broad-spectrum bio-activator containing over 30 essential microbial growth-promoting ingredients. By design, BIO ENERGIZER® is a balanced formulation of vitamins, trace nutrients, enzymes, organic acids, and biostimulants that stimulate the existing microbial community to greater metabolic capacity and efficiency. BIO ENERGIZER® is not a bacterium nor an inoculum.

MICROPLEX™ DN Added to Probiotic Solutions® Microbial Line

MICROPLEX™ DN is a dry powder of preselected and adapted facultative anaerobic microbial strains, specifically chosen for their ability to reduce Nitrates (NO₃) and Nitrites (NO₂). MICROPLEX™ DN is formulated to enhance the denitrification process under toxic, inhibitory, or cold weather conditions and specifically to reseed denitrifying systems and maintain the denitrification process. MICROPLEX™ DN has been

developed for use in the chemical, food processing, petroleum refining, textile, and related industries and for use in municipal plants receiving wastes containing oxidized nitrogen.

More information on this and other Probiotic Solutions® microbials is available at <http://probiotic.com/probiotic-solutions-environmental-remediation-products/microbials/>.

Huma Gro® Groups Added to WhatsAPP

Whatsapp, the Web-based instant messaging service for smart phones with more than 1 billion users worldwide, now includes 5 user groups for Huma Gro® distributors and technical personnel. The groups—Huma Gro® America, Huma Gro® Brazil, Huma Gro China®, Huma Gro® Europe, and Huma Gro® Esp (for Central and South America)—provide regional forums in which users can ask each other questions, share results, and post photos and videos related to the use of Huma Gro® products. You can only access these exciting groups by invitation from a Huma Gro® group administrator; if you are a Huma Gro® distributor and have not yet joined a WhatsApp group, contact your Huma Gro® Sales representative for permission and access instructions.

Here are a few examples of videos recently shared on the WhatsApp Huma Gro® Esp group:



Video: Foliar Application of Huma Gro® Breakout® on Rice in Columbia.

This short video shows hand foliar application of Breakout® on a rice field near San Jacinto del Cauca, Bolivar, Colombia.



Video Testimonial: Huma Gro® Program on Soybeans

In this Spanish-language testimonial video, a grower from Colombia talks about the amazing results he gets when using Huma Gro® products on soybeans. He describes a field trial that is underway in which traditional soil-applied fertilizers are being replaced and compared with foliar-applied Huma Gro® products. "As you can see, the development, the vegetation, and the color of the crop are very beautiful and uniform."

Look for us at these upcoming shows:

- AZ Water Assoc.; Phoenix, Az., May 5
- CAPCA; Reno, Nev., Oct. 15–17
- FPSA Process Expo; Chicago, Ill., Sep. 19–22
- BioControls USA East; Miami, Fla., Oct. 12–13
- WEFTEC; Chicago, Ill., Sept. 30–Oct. 4
- Northwest GCSA Turfgrass Expo; Coeur d'Alene, Id., Oct. 16–17

If you met some of our staff at a trade show and would like additional product information, fill out a contact form on the appropriate website:

- HUMA GRO®: <http://humagro.com/contact/>
- HUMA GRO® TURF: <http://humagroturf.com/contact/>
- PROBIOTIC SOLUTIONS®: <http://probiotic.com/contact/>

Stay Up-to-Date and Join the Conversation on Social Media



Bio Huma Netics, Inc., and its three product lines (HUMA GRO®, HUMA GRO® TURF, and PROBIOTIC SOLUTIONS®) offer a number of social media channels to help you stay informed about our products and activities. Here are some links to help you find us:

BIO HUMA NETICS, INC.

- Facebook: <http://www.facebook.com/BioHumaNetics>
- Twitter: [@biohumanetics](http://www.twitter.com/biohumanetics)
- LinkedIn: <http://www.linkedin.com/company/bio-huma-netics-inc>
- YouTube: <http://www.youtube.com/BioHumaNeticsInc>
- Google+: <http://plus.google.com/u/2/11642511357979036428>
- Instagram: www.instagram.com/biohumanetics/
- Flickr: <https://www.flickr.com/photos/144560924@N05>
- Blog: <http://bhn.us/blog-2/>

HUMA GRO®

- Facebook: <http://www.facebook.com/humagro>
- Twitter: [@HumaGro](http://www.twitter.com/humagro)
- Blog (English): <https://humagro.com/category/english/>
- Blog (Spanish): <https://humagro.com/category/espanol/>

HUMA GRO® TURF

- Facebook: <http://www.facebook.com/HumaGroTurf>
- Twitter: [@HumaGroTurf](http://www.twitter.com/humagroturf)
- Blog: <http://humagroturf.com/turf-blog/>

PROBIOTIC SOLUTIONS®

- Facebook: <http://www.facebook.com/probioticsol>
- Twitter: [@ProbioticSol](http://www.twitter.com/probioticsol)
- Blog: <http://probiotic.com/blog/>

Bio Huma Netics, Inc.

1331 West Houston Avenue
Gilbert, Arizona 85233
800.961.1220

www.bhn.us

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