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Marrone Bio Innovations and Groundwork BioAg Bio-stacked Microbial Seed Treatments Result in Increased Corn and Soybean Yields

Treatments show reduction of corn rootworm and nematodes

DAVIS, Calif. and MOSHAV MAZOR, Israel, Feb. 13, 2017 (GLOBE NEWSWIRE) -- Marrone Bio Innovations, Inc. (NASDAQ:MBII) (MBI) and Groundwork BioAg, Ltd (Groundwork) today announced successful seed treatment field trials of the world's first all-biological comprehensive seed treatment. The treatments tested in corn and soybeans contained a mycorrhizal inoculant from Groundwork, as well as a bioinsecticide, a bionematicide, and a biofungicide from MBI.

The Biological Stack Seed Treatment (BSST) is comprised of two insecticidal/nematicidal bacteria, one biostimulant/fungicidal bacterium and mycorrhizal fungi. Together, these synergistic microorganisms can provide a wide scope of benefits to growers: crop yield increases, resilience under abiotic stress conditions, reduction of fertilizer requirements (especially phosphorus), and resistance to soil-dwelling pests and plant diseases. In fact, we believe BSST constitutes the first all-biological seed treatment able to effectively provide all of these benefits without synthetic pesticides.

Dr. Pam Marrone, Founder and Chief Executive Officer of Marrone Bio Innovations, commented, "We are excited that the first year of trials confirmed and enhanced our previous field trials with our pesticidal microbes. The addition of Groundwork's mycorrhizae appear to enhance these microbes. We believe that this project has potential for high impact in the seed treatment market in general across a broad range of crops, and in particular can meet an unaddressed need for the rapidly growing organic grain segment and regions where pest resistance is an issue. Based on the BSST results, we are keen on expanding our trials to include biotic stresses such as sudden death syndrome in soybean, as well as *Fusarium* stalk rot and *Pythium* in corn and soybeans."

Dr. Yossi Kofman, Co-Founder and Chief Executive Officer of Groundwork BioAg, added, "Our Rootella™ product line is extremely cost-effective and has been proven to enhance yields of row crops, such as corn and soybean. Rootella is particularly effective under abiotic stress conditions, such as drought, flooding, acidity, or detrimental weather. The novel combination of Rootella with MBI's biotic stress protection will simultaneously enhance yields and protect crops - and thus farmer investment."

Corn and soybeans were tested in four Midwestern US states. In corn, the two bio-stacked treatments reduced corn rootworm populations and corn lodging, at least as well or better than the commercial chemical standard. Reduced corn rootworm damage generally correlated with increased yields. BSST Treatment 1 provided an average increase of 10.9 bushels (+5.8%), and BSST Treatment 2 an average increase of 12.5 bushels (+7.2%). Respectively, these improvements were 3 and 7.4 bushels higher than the commercial standard, which included chemical insecticide, nematicide and fungicides.

For trials targeting corn nematodes, most BSST treatments and the commercial chemical standard reduced nematode populations. Yields for BSST Treatments 1 and 2 averaged 16 and 22 bushels (7.3% and 10.4%) higher than untreated seeds, respectively. BSST Treatment 2 increased yields by 4.5 bushels over the standard chemical seed treatment (insecticide, nematicide, fungicides).

In soybeans, MBI's nematicides combined with Groundwork's mycorrhizal inoculant reduced soybean cyst nematodes as effectively as did the commercial standard treatment. Yields of BSST-treated soybeans averaged 8 bushels per acre (+15%) higher than those of untreated soybeans.

Groundwork separately tested its Rootella™ mycorrhizal inoculants in corn, soybeans and lentils in large-scale trials in three Midwestern US states. These trials confirmed improvements in plant vigor and vitality under abiotic stress conditions, including low fertility soils, lower phosphorous and drought conditions. In soybeans, Rootella™ provided an increase of 11 bushel/acre (19%), in corn an increase of 32 bushel/acre (30%), and in lentils an increase of 600 lb./acre (33%). In smaller, contracted research trials in Iowa, corn grown with 50% less phosphorous (P) performed at least as well or better than the full P applications. All Rootella™ trials were performed at commercially recommended application rates, however BSST combinations were not tested for abiotic or low fertility conditions.

While industry estimates vary, the companies estimate the global seed treatment market at \$4.2 billion, growing at a compound annual rate of 10% over the next five years. Insecticides currently hold the largest share of this market and the crop protection category is expected to be the fastest growing segment over the next several years.

The Binational Industrial Research and Development Foundation (BIRD), a foundation that supports and encourages cooperation between Israeli and U.S. companies in various areas of technology, selected the collaboration between MBI and Groundwork for partial funding.

About Marrone Bio Innovations

Smart. Natural. Solutions.

Marrone Bio Innovations, Inc. (NASDAQ:MBII) strives to lead the movement to a more sustainable world through the discovery, development and promotion of biological products for pest management and plant health. Our effective and environmentally responsible solutions help customers operate more sustainably while controlling pests, improving plant health, and increasing crop yields. We have four products for agriculture on the market (Regalia[®], Grandevo[®], Venerate[®] and Majestene[®]), and also distribute Bio-tam 2.0[®] for Isagro USA in the western U.S. MBI also markets Zequanox[®] for invasive mussels for water markets. We also have a proprietary discovery process, a rapid development platform, and a robust pipeline of pest management and plant health product candidates. At Marrone Bio Innovations we are dedicated to pioneering better biopesticides that support a better tomorrow for users around the globe. For more information, please visit www.marronebio.com.

About Groundwork BioAg

Let your ground work.

Groundwork BioAg, Ltd produces cost-effective mycorrhizal inoculants for commercial agriculture. Natural mycorrhizal fungi improve soil nutrient uptake in 90% of all plant species. When applied to agriculture, mycorrhizal inoculants significantly increase crop yields, especially under stress conditions. Growers can also reduce fertilizer application rates, most notably phosphorus. Groundwork's uniquely vigorous and highly concentrated Rootella[™] products have demonstrated impressive field trial results in several major crops, such as corn, soybean, tomato and onion. The company operates in several countries within the high-growth, multi-billion-dollar bioagriculture market. For more information, please visit www.groundworkbioag.com.

About the BIRD Foundation

Since 1997, the BIRD (Binational Industrial Research and Development) Foundation works to encourage cooperation between Israeli and American companies in various areas of technology, and provides free assistance in locating strategic partners from both countries for developing joint products. The BIRD Foundation supports projects without receiving any rights in the participating companies or in the project itself. The financial assistance is repaid as royalties from sales. The Foundation provides support of up to 50% of a project's budget, beginning with R&D and ending with the initial stages of sales and marketing. The Foundation shares the risk and does not demand that the investment be repaid if the project fails to reach the sales stage.

Marrone Bio Innovations Forward Looking Statements

This press release contains forward-looking statements that involve substantial risks and uncertainties. All statements, other than statements of historical facts, included in this press release regarding strategy, future operations and plans, including assumptions underlying such statements, are forward-looking statements, and should not be relied upon as representing MBI's views as of any subsequent date. Examples of such statements include statements regarding MBI's proposed comprehensive seed treatment product with Groundwork, including the development, commercialization, market for and potential benefits of the proposed product, expectations regarding the potential product being first of its kind to market, MBI's efforts with respect to other potential products, MBI's relationships with strategic partners, including Groundwork and Evogene, and funding by BIRD Foundation. Such forward-looking statements are based on information available to the Company as of the date of this release and involve a number of risks and uncertainties, some beyond the Company's control, that could cause actual results to differ materially from those anticipated by these forward-looking statements, including any difficulty in developing and commercializing the potential seed treatment product, marketing the potential product with MBI's principal customers, competition in the market for pest management products, lack of understanding of bio-based pest management products by customers and growers, and adverse decisions by regulatory agencies and other relevant third parties. Additional information that could lead to material changes in MBI's performance is contained in its filings with the SEC. MBI is under no obligation to, and expressly disclaims any responsibility to, update or alter forward-looking statements contained in this release, whether as a result of new information, future events or otherwise.

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