Microbial Biostimulants On-Farm Research Participation Overview

Hello.

Dr. Matt Kleinhenz is an Extension Specialist at The Ohio State University. He focuses on vegetable crop production, including sustainable-organic. Currently, he is coordinating an effort to help sustainable-organic vegetable growers select, use, and evaluate the performance of microbe-containing biostimulants more effectively. The effort involves many other people and the team invites you to participate. Hosting an evaluation of commercially-available, NOP-approved microbial biostimulants on your farm is one way to contribute and to learn more about these important products. That process is the focus of the FAQ section below, which explain how to get involved in and benefit actively from the effort. Please look over the FAQ section and contact us to learn more, including about becoming a grower-cooperator.

About the Team's Effort on behalf of Growers and Other Stakeholders

Q: Who is involved?
A: The effort is coordinated by Dr. Matt Kleinhenz (ph. 330.263.3810; kleinhenz.1@osu.edu) and program coordinator Nicole Wright (ph. 330-202-3555 x2717; wright.1128@osu.edu). The following people, organizations, and businesses also contribute significantly: a) Dr. Bonnie Ownley, (Univ of TN), b) Dr. Subbu Kumarappan (The OSU), c) Dr. Chris Taylor (The OSU), d) Dr. Carol Goland and the Ohio Ecological Food and Farming Association, e) John Patrick and the Tennessee Organic Growers Association, f) microbial biostimulant manufacturers, g) extension professionals and consultants, and h) growers.

Q: What is the goal?
A: The goal is to help growers select, use, and evaluate the performance of microbe-containing biostimulants more effectively, i.e., to help growers obtain greater returns on investments in microbial biostimulants more consistently.

Q: Why is this work necessary?
A: It is true that hundreds of millions of dollars are spent on these products each year, but what they offer to most growers, most years in terms of return on investment is mostly unknown. This work is necessary to reduce financial loss by growers each year due to sub- optimal selection and/or use of microbial biostimulants. The work is setup to help growers receive the fullest possible benefit from commercial microbial biostimulants more consistently. More information is needed to help make that happen and that is where this team comes in. They are spearheading a process wherein growers and other team members develop that information and get it to people who need it. Going forward, through this work, growers and people they rely on, such as consultants and extension professionals, will be able to evaluate microbial biostimulants on their farm.

Getting Involved: Who, What, When, Where, Why, and How?

Q: How can I help and benefit from the effort?
A: Growers and others can help and be helped in various ways. Let's focus on three for now. First, consider participating in team-sponsored events (e.g., conference calls, field days, workshops), reviewing resources it provides, and sharing input and feedback on both. Second, as a grower, consider hosting an evaluation on your farm (more on that soon). Third, consider contacting us if you would like to learn more about the effort and to discuss other ways of contributing to and benefitting from it.

Q: **Specific to on-farm evaluations, who is invited to participate?**
A: Commercial growers hosting an on-farm evaluation in 2018 will:

1. Grow at least one of these crops: tomato, butternut squash, lettuce, spinach, or carrot,
2. Be able to devote a minimum of approximately 100 row-feet total to testing one product on carrot, lettuce, or spinach, or a minimum of 200 row-ft to testing one product on tomato or squash. Testing one product requires approximately 100-200 row-ft in most crops. And,
3. Have land used in the evaluation be organically certified, eligible for organic certification, or in transition.

Q: To help in other ways, what other events and resources has the team already provided?
A: We:

- Hosted three conference calls in 2017
- Are hosting another series of three calls in spring of 2018
- Established a microbial biostimulant database and a listserv and,
- Carried out several on-station and on-farm evaluation trials.

Learn more about them and upcoming events and resources at http://u.osu.edu/vegprolab/research-areas/vegebiostimsferts/ or contact us for more information.

Q: What is expected of growers hosting an on-farm evaluation?
A: Overall, grower-cooperators should plan to manage the crop as they normally do. However, in addition to that, grower-cooperators should plan to record observations and key numbers describing the plots and the effects of inoculation with the commercial microbial biostimulant. Growers will receive guidance on recording observations and numbers. Plan to take pictures of plants and plots and to take basic measurements such as plant height, size, and crop yield.

Q: **When will on-farm evaluations start?**
A: Right away. The team is requesting information from interested growers and will be in contact again by end of March.

Q: **Do I need to have experience with microbe-containing biostimulants or on-farm research to host an on-farm evaluation? A**: Experience with either is desirable, but NOT required. We welcome growers who want to experiment with microbe- containing biostimulants on their farms regardless of their experience.

Q: **How many products does a grower need to test on their farm?**
A: A choice of six products will be made available free of charge. The six test products available for free are listed in the Appendix. Growers may also nominate a product of their choice that is not in the Appendix, but it must be an OMRI-listed or locally-approved microbe-containing biostimulant. A total of up to two products can be evaluated by one grower.

Q: **Will the product(s) be given to me?**
A: Yes, if it is one of the six products listed in the Appendix. A project team member will work with each grower to determine which crop(s) and which products(s) he/she would like to evaluate given space and time considerations and then provide the grower with the product(s). Grower nominated products are the responsibility of the grower to optain.

Q: Will I apply the product(s)? Regardless, how will they be applied?
A: Yes, growers will be asked to apply each product according to recommended rates. Team members can provide additional guidance, if needed. Most products will be applied as root or soil drenches, directly to the soil near the base of the plant.

Q: **Will it be as simple as putting the product on some plots and not on others or is there something else to it?**
A: It can be as straightforward as a yes-no application or have one additional component. A grower-cooperator can test a product **application rate** or **application timing** treatment. The grower will determine which treatment is most interesting to them and then choose one of the following paths:

a) apply as a root drench at two times in the season (e.g., transplanting, two and four weeks after transplanting) or,
b) apply once but at two rates (e.g., 0.5x, 1x, or 1.5x the recommended rate).

Q: **Will the team provide guidance on experimental setup, plot maintenance, and data collection?**
A: Yes. The locations of plots will be set by the grower and team working together and using firsthand observations, maps, pictures, drawings, and other descriptions of the potential evaluation area provided by the grower. Guidance on plot establishment, maintenance, and data collection will be provided to growers from the beginning through the end of the evaluation via in-person visits, emails, and other communication. Crop-specific information will be given to cooperators in advance

Q: **What other resources can I use while completing the evaluations?**
A: A number of useful resources are available. We recommend the Sustainable Agriculture Research & Education program technical bulletin "How to Conduct Research on your Farm or Ranch" and the Organic Farming Research Foundation "On-Farm Research Guide."

Q: **What type of information are growers asked to record?**
A: The specific information to record and how to record it will depend somewhat on the crop (tomato, squash, lettuce, spinach, carrot). During production, it will be important to determine if product application changes crop vigor (e.g., size, weight, growth rate), appearance (e.g., color), and/or yield. Quickly taken scores, ranks, notes, and pictures will help determine this. Later, records of the use of other inputs will help explain the results. Again, protocols and guidance will be shared with growers in advance and through the season.

Q: Will grower-cooperators be asked to do anything else besides what has been described about the evaluation?
A: We are learning from growers. We look to create situations where other growers also learn from our cooperators. Therefore, grower-cooperators will be invited to participate in team activities such as field days, plot tours, webinars, conference calls, and programs.

Q: **Will grower-cooperators be paid for hosting an on-farm evaluation and participating in other ways?**
A: Yes, grower-cooperators will receive a stipend of $250 per year while participating in an on-farm evaluation. Also, growers will be eligible to receive support for participating in activities by invitation.

Q: **Will the team protect personal information and other farm-related information from being released?**
A: Yes, respecting that portions of the project-wide dataset will originate on farms, the collection, analysis, synthesis and sharing of this information in public formats will conform to standards and privacy policies set by University offices (The OSU and Univ. of TN).

Q: **Does a grower-cooperator have to host an on-farm evaluation each of the three years?**
A: No. However, we welcome the opportunity to work with growers on evaluations throughout the planned period of the effort (2017-2019).

Q: **How do I get more information about the effort and to contact team members?**
A: See the "Bugs in a Jug" (http://u.osu.edu/vegprolab/research-areas/vegebiostimsferts/) and Organic Farming Research Network (OFRN) (http://go.osu.edu/biostimulants-in-vege-production) websites or call or email a team member (information below and at the Bugs in a Jug website).

Contacts:
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Program Coordinator: Nicole Wright (wright.1128@osu.edu; 330-202-3555 x2717), The OSU-OARDC
Project co-Coordinator: Dr. Bonnie Ownley (bownley@utk.edu; 865-974-0219), Univ. of TN
Grower Association Liaisons: Eric Pawlowski (eric@oeffa.org; 614-421-2022 ext. 209) and Dr. Carol Goland (cgoland@oeffa.org; 614-421-2022 ext. 202) at Ohio Ecological Food and Farm Association (Illinois, Indiana, Iowa, Michigan, Missouri, and Ohio) and John Patrick (johnepatrick@gmail.com; 615-876-0899) at the Tennessee Organic Growers Association.

Appendix: Microbe-containing crop biostimulants to be tested on-farms

Product	Manufacturer	Product Type	Product Description (from company websites)
(1) Biogenesis I TM NP (Non-Polymer) Soil Amendment	Tainio Biologics, Inc.	Multiple types of bacteria	"Applied to soil, BioGenesis I NP™ establishes select beneficial microbial populations needed for balanced soil biology to improve soil health and ensure optimum plant growth."
(2) Mycogenesis TM Soil Amendment	Tainio Biologics, Inc.	Mix of bacteria and fungi	"MycoGenesis colonizes, nourishes and aids plant roots and the surrounding rhizosphere for improved crop health, greater drought tolerance and mineral availability (i.e. phosphorus, nitrogen, calcium, iron, and more) and a robust soil food web."
(3) EcoFungi	Ecomicrobials, LLC	Multiple types of fungi	"EcoFungi increases the ability of the plant to get water and nutrients from the soil, by increasing up to 1000 times the area of soil where the plant gathers its nutrients. Furthermore, EcoFungi has the ability to extract nutrients that are not chemically available to the plant."
(4) Environoc 401	Biodyne-Midwest, LLC	Multiple types of bacteria	"Microbes selected for their capabilities to provide enhanced plant health and production through enhanced rhizosphere (root micro environment) activities from specialized capabilities of the microbes"
(5) MycoApply® EndoMaxx	Mycorrhizal Applications, Inc.	Multiple types of fungi	"These beneficial fungi greatly increase the effective rooting area of plants thereby enhancing plant growth, vigor and tolerance of environmental extremes."
(6) MycoApply® All Purpose Granular	Mycorrhizal Applications, Inc.	Mix of bacteria and fungi	"MycoApply All Purpose is a granular material containing mycorrhizal fungi that colonize roots and extend into the surrounding soil forming an essential link between plant and soil resources."

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