

Biostimulants: Where, When, and How



By Richard Jones | February 14, 2019



Michelle Jones, The Ohio State University

During the [Biocontrols West USA Conference and Expo](#) in Portland, OR, in March, Michelle Jones, Professor and D.C. Kiplinger Floriculture Endowed Chair at The Ohio State University, will discuss the roles that biostimulants can play in ornamental production. Her session will address questions regarding how to incorporate biostimulants into production systems. Jones will also share current research results on different biostimulant products for both greenhouse ornamentals and vegetables. Growers will learn what success with biostimulants looks like and how you should conduct in-house trials.

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Prior to the event, *Greenhouse Grower* caught up with Michelle Jones and asked her more about what attendees can expect.

Q: We hear a lot about biostimulants in fruit and vegetable production, and how their primary use is a focus on improving plant quality as opposed to pest management or fertilization. How are biostimulants being used successfully in ornamentals production?

Jones: Biostimulants are products that enhance nutrient uptake, nutrient efficiency, tolerance to abiotic stress, and crop quality. With the production of fruits and vegetables, increased yield and crop quality are more easily observable and measurable results. With ornamental plants, success can be a little more nebulous. Biostimulants can also increase the quality of ornamental crops, which results from greater shoot or root growth, greener leaves due to increased chlorophyll content, increased flower numbers, larger flowers, and/or decreased time to flowering (i.e. decreased production timing). While many products claim that they increase plant growth, an increase in vegetative growth can be at the expense of flowering, and this is not desired in flowering ornamentals.

Q: These products aren't typically labeled like we're used to seeing with biological control products. How should growers make a decision on what product to choose for their specific crop and production needs?

Jones: [Editor's note: Until the [most recent version of the Farm Bill](#) in December 2018, there was no legal definition for biostimulants in the U.S.] These products are currently not regulated by the EPA like pesticides and plant growth regulators. Since there is no regulatory framework in place for their introduction into the marketplace, many products have incomplete labels and product efficacy information. There are an overwhelming number of products available. A [biostimulant database](#) that is being compiled at The Ohio State University includes products with a growth promotion claim on their label for vegetable crops (currently focused on Organic Materials Review Institute- listed products) and nursery and ornamental crops. This database has initially focused on products with microbial (fungi or bacteria) active ingredients. Growers should not rely solely on the information available on the biostimulant product labels to select products; they should ask for additional information from the manufacturer or the sales rep. Do they have third-party efficacy results that demonstrate growth promotion or enhanced stress tolerance in the specific crops of interest? Efficacy testing of many products has been conducted in field soil, and the plant responses may not be the same when growing in a soil-less mix. Do they have efficacy data for ornamental plants in various greenhouse mixes? Growers need to be able to identify biostimulant products that will be consistently effective in their production systems on a diverse range of ornamental plants.

Q: With pest management tools and fertilizers, you can generally gauge the success of an application. Things are a little more complicated with biostimulants. How can ornamental growers get a feel for the real results of using a biostimulant in a crop?

Jones: Biostimulants can improve crop quality by enhancing plant growth or by increasing tolerance to abiotic stresses. Healthy plants will be more resilient when it comes to environmental stresses like drought. While plants are not likely to experience extreme drought stress during production, plants may experience abiotic stresses or less than optimal environmental conditions during shipping and/or retailing (i.e. postproduction). For example, if biostimulant treated plants are more likely to recover from extreme wilting and remain marketable, then this is a successful application. Plants will not always experience these adverse conditions, so biostimulant applications function like insurance against the environmental stresses that might be experienced and might lead to crop losses. Growers will need to do some small-scale trialing to determine if they can get real benefit from these products. A few treated and untreated plants can be allowed to wilt, and then recovery can be assessed after rewatering to determine if biostimulant treatments would protect specific crops and allow them to remain marketable following stress. Growth promotion via the increased efficiency of nutrient uptake and/or utilization may not be realized if crops are already grown at optimal to high fertility rates. Growing some plants with lower fertilizer rates plus and minus a biostimulant will help growers determine if they can grow a high-quality crop with reduced fertilizer inputs. Successes can also be seen if production timing is reduced and better quality crops are produced.

Q: From your research, are there particular crops or production systems that are better candidates for using biostimulants?

Jones: Researchers at The Ohio State University are actively evaluating different biostimulant products with claims of growth promotion and enhanced stress tolerance. One of the biggest challenges, especially with microbial active ingredients, is identifying products that will work on the diverse crop species grown in greenhouses. We have seen promising results in containerized crops growing in soilless media, as well as in hydroponics systems. The adoption of biostimulants by the greenhouse industry is well behind that of field-based agriculture, but the potential for improvements to ornamental (as well as fruits and vegetable) plants is great.

For more information on Jones' presentation at Biocontrols USA West Conference and Expo, and to register for the event, go to [BiocontrolsConference.com/usa-west](#).

Richard Jones is Executive Editor for Meister Media Worldwide's U.S. Horticulture Group, including Greenhouse Grower®, Greenhouse Grower® TECHNOLOGY, American Vegetable Grower®, American Fruit Grower®, Western Fruit Grower®, and Florida Grower® magazines. See all author stories here.