ORGANIC BROADCASTER™

Volume 26 | Number 6 | Midwest Organic & Sustainable Education Service | November | December 2018

Full-day classes dig deeply into farming topics

By Audrey Alwell

The 2019 Organic University™ offers 9 in-depth courses taught by experienced farmers, researchers, and ag professionals. These engaging classes provide deeper content than farmers can get from a 90-minute workshop, and give them a chance to get answers for their specific farm situations. Past participants rate Organic University highly, adding that "presenters share their vast knowledge and experience in a very accessible and relatable way."

Organic University takes place Thursday, Feb. 21 from 10 a.m. to 5:30 p.m., just prior to the MOSES Organic Farming Conference at the La Crosse Center in La Crosse, Wis. Registration opens Nov. 29, with Early Bird pricing of $160. See registration details at mosesorganic.org/organic-university.

Wholesale Vegetable Production for Small- to Mid-Scale Farms

Ariel Pressman & David Giedd

Dwindling CSA numbers? Ho-hum turnout at the farmers market? Growing for wholesale accounts might be a better option.

Instructor Ariel Pressman's Seed to Seed Farm is a 13-acre certified organic vegetable farm, which sells almost 100% to wholesale customers. He'll examine the specific systems and investments needed for different wholesale models, and help you deterimine which crops and markets are most appropriate for your specific farm scale, skill set, and set up. One of his customers, Lakewinds Natural Foods' category manager David Giedd, will share tips on working with retailers.

At the end of the day, you'll have a customized wholesale plan detailing the crops you'll grow, how you'll set prices, and how you'll market your crops—a business plan that will balance profits with your desired quality of life.

MOSES ORGANIC UNIVERSITY™

What it Takes to Grow Industrial Hemp

Bryan Parr, John Strohfus, Jeff Kostuik, Alden Braul, Melody Walker, & Margaret Wiatrowski

Nicknamed "The Forgotten Crop," industrial hemp is making a comeback after a 60-year hiatus. This course explores what growers have learned about planting, growing, harvesting, cleaning, storing, and marketing this organic or conventional crop.

Bryan Parr of Legacy Hemp in Wisconsin and John Strofus with Minnesota Hemp Farms will share the good, the bad, and the ugly from the Upper Midwest's 2018 growing season. Jeff Kostuik and Alden Braul from Hemp Genetics International will share how industrial hemp is doing in Canada, which has had regulated production since 1998. In addition, Margaret Wiatrowski, Minnesota Department of Agriculture, and Melody Walker, Wisconsin Department of Agriculture, Trade & Consumer Protection, will share state-specific regulations, procedures, and data.

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Easy-to-grow microgreens can add year-round farm income

By Hallie Anderson

Microgreens have been popular with talented chefs for many years but are now gaining ground with the discerning home cook who adds them to eggs for breakfast, or as a nutritional and flavor burst in smoothies, sandwiches, and dinner salads. For the farmer, microgreens can be a valuable addition to farm enterprises, providing cash flow even in the winter months. Microgreens can be easy to grow and reliable under the right conditions with lots of opportunities for expansion.

Microgreens are the cotyledon stage of any vegetable or herb plant, generally grown in trays in a greenhouse or controlled growing space and marketed as a superfood. They are a great wholesale product and appeal to CSA and farmers market customers.

We added microgreens to our farm, 10th St. Farm & Market in Afton, Minn., in our second production year to help with year-round cash flow and help pay for the heat in our greenhouse in the winter months when we're starting early transplants. We sell the greens through our three-season CSA, wholesale markets, and a well-attended farm stand.

Our microgreens have allowed us to grow our business without increasing field space. The packaged greens have attracted new customers to our CSA because they liked our product when they bought it at the co-op. It's great when customers find us rather than the other way around!

Flats of microgreens grow in the greenhouse at 10th St. Farm & Market in Afton, Minn., which sells 1,500 pounds a year through CSA, farm stand, and wholesale markets.

Photo by Hallie Anderson

Growing Tips

First decide what works best for your farm. Do you have greenhouse space that sits idle in the winter and mid-summer months? Do you have a seed-starting station set up in a spare room? You can utilize these resources to their full potential by adding microgreen production.

Just like all new varieties on a farm, there is a trial period with microgreens. Grow different varieties to determine which you want to focus on, and then set yourself up to do them well. The most common products are individual varieties or mixes sold direct to consumers or through grocery stores or farmers markets.

Microgreens are generally grown in trays in a growing medium. Some people use mineral wool mats like in hydroponic systems or potting soil in a greenhouse environment—we use the latter. The seed is planted on the surface of the tray, watered in, and allowed to grow

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Grafting holds promise for vegetable production

By Matthew Kleinhenz

Grafting woody plants to produce desired traits has become routine. The value for producing fruit is rarely questioned. The same is true of vegetable grafting in many other countries as well as in large portions of the North American greenhouse vegetable industry. A small, but growing number of vegetable farmers and researchers in the U.S. is looking at the practice to determine its best application in soil-based production (including sustainable-organic) of tomato, pepper, watermelon, cucumber, cantaloupe, and other crops.

As a production tool and source of income, grafting is regarded as an emerging, must-test technology capable of significant and timely outcomes for the U.S. vegetable industry. The reason for this is straightforward with a logic hinging on three points: grower need; shortcomings of traditional variety development; and, grafting's ability to target specific traits.

First, growers will continue to rely heavily on the genetic makeup of their plants to provide abundant, high quality crops with ever-greater reliability and efficiency.

Second, using standard approaches, variety development teams will continue to fall just short of providing farmers with exactly what they need, at least in the short-term. Developing a range of individual farmer-friendly varieties—each containing all the desired traits—has been impossible so far. Variety development teams are exceptionally talented. However, no matter their ability, these teams are typically required to select one trait over another (*i.e.,* to compromise), resulting in most varieties having at least one troublesome weakness.

Third, grafting dramatically alters the variety development and selection process, improving it for farmers. Scion (fruiting) and rootstock varieties are developed and selected separately, each to bring key attributes to the physical hybrid created by their being grafted. Breeders face fewer and less significant compromises since they are free to focus on scion and root system traits separately, not the dilemma of having to combine a full range of traits into one variety. Growers can select from an array of scion and rootstock varieties to create combinations meeting their specific needs.

Research plots at an organic farm in North Carolina show how various rootstocks are faring in soil infested with a *Sclerotium rolfsii*. Celebrity was used as the scion variety. The Ohio State University and North Carolina University researchers collaborated in this on-farm research.

Photo by Frank Louws, North Carolina State University

Taken together, these points reveal why changing the variety development and selection process through grafting is speeding the delivery of a wider array of important, naturally occurring traits to farms, allowing farmers to make faster and more effective use of genetics.

Still, all is not perfect. Although some major benefits made available by using grafted plants have been demonstrated, evidence for others is promising but less convincing, so far.

Limiting damage caused by nematodes and soilborne diseases (e.g., Verticillium and Fusarium wilts) that attack the roots or lower stems of crops drives much of the current interest in grafting among tomato, pepper, watermelon, cucumber, and cantaloupe growers, grower-advisors, and investigators. That ability has been made clear through collaborative on-station and on-farm studies and farmer-led evaluations, with some conducted in organic systems. Findings are also summarized in an increasing number of extension/industry resources calibrated for local conditions. Indeed, farmers are rarely far from a university or industry professional with some grafting expertise. (See updates at www.vegetablegrafting.org/about/regional.) Regardless, for some farmers unable to rotate away from infested soils, change crops, or use another tactic, superior genetics represents an opportunity to maintain an income.

More effective nematode and disease management is responsible for much of the interest in vegetable grafting but it is not the only driver. Rootstock-scion combinations that: a) withstand abiotic stress (*e.g.,* drought/flood, salinity, extreme temperature) more effectively; b) use inputs (*e.g.,* land, water, nutrients) more efficiently; c) produce greater marketable yield under good or alternative (*e.g.,* strip-till or no-till) production conditions; and/or d) improve fruit quality are also possible and a topic of study among farmers and investigators —again, with many evaluations completed in organic systems. Findings are shared in scientific articles (see www.vegetablegrafting.org/resources/reference-database) and in publications, field days, workshops, presentations, webinars, etc. (See www.vegetablegrafting.org/resources.)

Naturally, the opportunity to supply grafted plants to eager vegetable farmers (and gardeners!) has caught the attention of seedling/transplant growers and propagators. Demand for grafted plants in the U.S. currently exceeds the domestic supply, and appears to be increasing. To the extent that farmers and gardeners see the benefits of grafted plants, it will be necessary for someone to provide them, including certified-organic versions, in many rootstock-scion combinations and in varying numbers. Important advances in the process of preparing grafted vegetable plants have been made recently thanks to industry-university partnerships, and additional improvements are likely. Online or downloadable how-to guides (*e.g.,* www.vegetablegrafting.org/resources/grafting-manual and u.osu.edu/vegprolab/research-areas/grafting-2), hands-on workshops and trainings, and other resources address many questions about making grafted plants. In the Midwest, experts including Drs. Wenjing Guan (Purdue), Ajay Nair (Iowa State University), and Cary Rivard (KSU) provide excellent research-based information on a range of grafting-related topics.

The overall expectation is that grafting will help more people make more money, especially by farming more sustainably and diversifying their product line. Skeptics claim that most of the money made on

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Grafting Vegetables — *from page 5*

vegetable grafting currently goes to seed companies and propagators, given the costs of rootstock seed and grafted plants. Fair point but that is not the whole of it.

Careful, comprehensive analyses of "grafting economics" –the economic feasibility of producing grafted plants as a business and of using them in commercial fruit production – are complete and others are underway. It is clear that producing grafted plants is more costly than producing standard seedlings (transplants) and that increases in production costs depend on the number of plants produced. Also, most agree that the costs of producing grafted plants can be estimated more reliably than the economic benefits of using grafted plants in commercial fruit production, although yield increases exceeding 5-10% are common. Real benefits must be determined one farm, one season, one crop and, maybe, one field at a time. In one experiment focused on organic heirloom tomato production, economic risk of crop loss due to root-knot nematode damage exceeded the 46% higher cost of grafted transplants.

Estimated Use of Grafted Vegetable Plants in the USA in 2015 (all sectors)

Use	Tomato	Watermelon	Other Crops	Sources
Greenhouse	10 million	none	cucumber	Canada, Mexico, USA
High Tunnel	1 million	none	melon, eggplant	USA, Canada
Field	6 million	200K	melon, eggplant	USA, Canada, Israel
Retail	1 million	none	eggplant, pepper, potato	USA

courtesy Dr. Chieri Kubota, The Ohio State University

The consensus is that grafting economics are not settled and that they are complicated to evaluate but should always attempt to take all related costs and gains into account. Grafting economics appear to be personal (farm-/farmer-specific) in that they depend on individual valuations of the perceived gains and losses resulting from making and/or using grafted plants.

Anecdotally, over the years, in discussing grafted plants as a product (propagator point of view) and tool (fruit grower point of view) with farmers who have experimented with them well and/or analyzed reports about them carefully, it seems that for every four farmers I spoke with, two were generally positive, one was negative, and the fourth was unsure. This mixed perspective on grafting is consistent with the views of people currently most optimistic about the potential of grafting to benefit U.S. vegetable growers and gardeners, including organic. While use of grafted plants has risen sharply in the last 10-15 years, utilization has not reached its expected peak. Improvements in rootstock varieties, identifying optimal rootstock-scion combinations, and grafting methods and supply streams are required, along with better recommendations for using grafted plants more cost-effectively under more conditions on more farms and in more gardens.

Seed companies, grower and commodity organizations, private organizations and foundations, universities, USDA and SARE, and others have sponsored an impressive amount and range of studies and extension-outreach activities aimed at strengthening the utility of vegetable grafting. Consider completing your own fair and reliable evaluation, perhaps with extension or another trusted collaborator.

The consensus view is that grafted plants tend to offer vegetable growers in the U.S. the greatest return on investment when one or more of the following conditions are true:

1. Their operation is being hurt or is likely to be hurt by a damaging infestation of nematodes or outbreak of soilborne disease that can be tolerated by at least one rootstock variety.
2. Their preferred scion variety is susceptible to that nematode or disease and using another scion variety is unappealing or impossible (*e.g.,* for market reasons).
3. The farm has a small land base and few other nematode/disease management options will bring the needed level of (economic) control.
4. Crop vigor and yield are very important, especially to enhance or maintain the farm's presence in the market.
5. Single plantings will be picked as many times as conditions allow; in other words, total seasonal yield is important and the grower may be willing to tolerate having a smaller early yield in exchange for a greater total seasonal yield.

Learning more about vegetable grafting may be most relevant in the near-term for farms for which one or more of these conditions are true. However, grower experiences and research-based evidence suggest that learning more about this long-standing technology also would be useful for many others.

Matthew Kleinhenz is a professor in Horticulture and Crop Science at The Ohio State University.

NRCS CAP138 — *from page 7*

vegetable operation on the outskirts of Milwaukee. She said she was happy to find her TSP, because "now we have even more knowledge to bring our farming operation to the next level."

Both Leupi and Sherman found CAP138 was a lot of information to wade through, but their experienced TSPs made all the difference in their positive experiences.

"Having the resource and time for producers to take full advantage of programs is an issue," Sherman explained. "I don't expect to hold on to my farm, but I want the best chance to have it preserved, share practices, and have it in balance with nature."

Another client of Borgerding's, Jason Lehman, said he was drawn to CAP138 for the financial help. Lehman, a new organic grain producer from Madelia, Minn., is in his first year of certified organic harvest. "I've looked at other programs, but the lack of flexibility and adaptability to organic production has prevented me from using them," he said.

CAP138's OSP Templates cover all aspects of a farm's organic system plan and can be submitted to a certification agency after completion of the program. However, successful completion of the CAP138 process does not mean a farm is certified organic. A producer must still submit a completed OSP to an organic certifier for review and inspection prior to being certified organic. The producer is responsible for completing all of the OSP requirements not addressed by the CAP138 resource concern inventory, erosion control inventory, and summary record of planned NRCS conservation practices.

The CAP138 program is entirely voluntary and there is no obligation to become certified organic once the plan is completed. There is additionally no requirement to submit the NRCS-specific sections (resource inventory, erosion control inventory, etc.) to the organic certification agency for review.

It is also incumbent on the producer or landowner to sign up with NRCS first before enlisting the services of a TSP. Any services rendered before a contract is signed with the NRCS won't be reimbursed.

Matt Leavitt is an organic specialist with MOSES.