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# LU Horticulture Notes August 2018

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## Exciting time at LU Horticulture Program!

*By Touria Eaton*

The LU Horticulture Program coordinated the 2018 LU Carver Farm Field Day on August 10. Six faculty members from LU (Eaton, Egilla, El-Dweik, Heise, Pathan, and Wetzel) and three members of USDA/NRCS (Cork, Atkisson, and Lugo-Camacho) presented. Twenty individuals attended, including farmers, community gardeners, and students. Mr. Brad McCord and Mr. Bart Hawcroft, two close collaborators of LU Horticulture Program, from NRCS and MDA, respectively, also attended.

The event started in the classroom with an overview of the program and justification and importance of each presentation. Then the group headed to the greenhouses to hear about pest-free hydroponic production and the importance of the weather station for Horticulture. The group headed to the field, after that, to learn about the best cultivars for blueberry production in Missouri; produce safety; soil health; and quinoa, edamame, kale, tomato, lettuce, and Brussels sprouts production. The tour ended with a presentation at the aquaculture facility.

Everybody learned something, including the presenters. The evaluations of the overall program, by those in attendance, indicated a 3.8 knowledge gain. The knowledge gain was assessed by subtraction of the knowledge in the topics before the presentations from the knowledge in the topics after the presentation. 5 indicated very knowledgeable and 1 indicated not knowledgeable at all. The weather was great and it was a fun day for all.



## Eat Your Vegetables!

*By Touria Eaton*

**Turnip:** Turnips come in many shapes, sizes, and colors. The root of the turnip offers some fiber and vitamin C. Most nutrients, though, are found in the turnip greens.

Turnip greens, as all brassica greens, are rich in beta carotene, vitamin C, folate, fiber, and calcium. They also contain sulfur-containing chemicals, called glucosinolates, which give brassicas the distinguished bitter and pungent taste. Indole-3-carbinol and sulforaphane are the most widely known glucosinolates, and have been shown in, animal studies, to inhibit the growth of cancer in different organs (breast, bladder, colon, lung, liver & stomach).

Still, as a member of the brassica family, roots of turnips also offer many phytochemicals that help protect our health.



References:

Lin, Long-Ze, and James M Harnly. 2010. Phenolic Component Profiles of Mustard Greens, Yu Choy, and 15 Other Brassica Vegetables. *Journal of agricultural and food chemistry* 58(11):6850-6857.

## Crops to Harvest in Late August & September or Find at your Local Farmers' Market

*By Joyce Rainwater*

Many crops are ripening in August and September including:

- Tomatoes
- Peppers
- Onions
- Green Beans
- Herbs
- Squash
- Potatoes
- Cantaloupe
- Cucumbers
- Eggplant
- Apples
- Pumpkins

\*Harvest times are dependent on planting dates, maturity times, and weather conditions.\* Happy harvesting and eating

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## Protection of Pollinators

*By Touria Eaton*

August and September may be a heavy time for bee activity, as most of the fruit crops are flowering, and pesticide application is heavy. Protection of bees is thus important to consider when pesticides are used.

Pesticides, applied to protect vegetable crops, can affect pollinators through a multitude of routes: direct contact with the sprays of the pesticides, contact with treated surfaces of the plants, or ingestion of pesticide-contaminated nectar by the bees. Also, pesticide-contaminated dust may adhere to the body of the bees, or pesticide-contaminated pollen may be taken back to hive.

Bees are crucial in the production of fruit crops such as tomatoes, eggplants, and squash. During flowering and pollen shed, bees visit the crops' flowers and pollinate them, leading to fruits. Unfortunately, populations of bees have declined worldwide in recent years. Current research attributes this decline of bees to parasites, diseases, low genetic diversity, poor nutrition, loss of habitat, or pesticide use.

Decisions made by the farmer make a difference in the exposure of pollinators to toxic levels of pesticides. While pesticides applied to crops are only one among many factors that threaten pollinators, pesticides also are the one factor that growers can control. Taking measures to minimize pesticide poisoning of pollinators, in all crops, is an important responsibility of all pesticide applicators.

### Tips to Protect Pollinators from Pesticide Poisoning:

**Do not treat plants in bloom.** If pesticide applications are needed in crops that bloom over long periods, make applications late in the day or at night when pollinators are not foraging so that there is sufficient drying time before foraging of pollinators begins. Also, control weeds to keep pollinators from foraging near the treated crops.

**Consider pesticide drying time and weather temperatures.** Some pesticides are more toxic to pollinators when they are wet than when they are dry. Spinosyns, such as Entrust, have this characteristic. Spray pesticides when there will be adequate drying time before pollinators' activities start. Wet pesticides usually dry in two to three hours, depending on weather conditions and crop canopy. Honeybees are at optimal activity when weather temperature is between 57 and 100°F. They, however, can become active and forage at temperatures as low as 55°F. If temperatures following spraying are unusually lower than the optimum, pesticide residues, on the crop, may remain toxic to bees much longer than at optimal temperatures. Conversely, if late evening or early morning temperatures are higher than optimal, bees may forage actively on the pesticide-treated crops during these times. Farmers are to stop spraying pesticides when the temperature is optimal for bees to be active.

**Avoid drift on non-target areas near the field where blooming plants may be located.** Wind speed and application equipment both influence drift.

**Opt for liquid over powdered formulations of pesticides.** Wettable powders, dusts and microencapsulated formulations are more toxic to pollinators than emulsifiable concentrates (or other liquid formulation with active ingredient in solution). Products that do not have acute toxicity but could cause injury to immature bees, if carried back to the hive, should not be applied in particulate forms.

**Make use of pesticides that are made for soil and seed applications.** These applications reduce exposure of the pollinators to the pesticide compared to foliar applications, unless the pesticide is systemic, as is the case of neonicotinoids, and the plant's uptake of the active ingredient produces residues in the plant's pollen or nectar. If neonicotinoids are to be used they should be used early in the season and in very low doses.

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## Protection of Pollinators (Cont. page 2)

**Read the label of the pesticide to be used for bee hazard rating.** In order to protect bees, the United State Environmental Protection Agency (EPA) introduced a label change for insecticides that contain one or more of the neonicotinoids. The bee icon (below) is placed in the Environmental Hazards section of the pesticide label.



**Use the least toxic pesticide.** The EPA registration includes a "Bee Hazard" warning in the Environmental Hazards section of the pesticide label. The EPA bee toxicity groupings and label statements are as follows:

**High (H):** The label has the following statement: "This product is highly toxic to bees and other pollinating insects exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees or other pollinating insects are visiting the treatment area." If the residues phrase is not present, this indicates that the pesticide does not show extended residual toxicity.

**Moderate (M):** The label has the following statement: "This product is moderately toxic to bees and other pollinating insects exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product if bees or other pollinating insects are visiting the treatment area."

**Low (L)** All others. No bee or pollinating insect caution required.

### Resources:

How to Reduce Bee Poisoning From Pesticides. 2006. Oregon State University.

<http://www.cdфа.ca.gov/files/pdf/ReduceBeePesticideEffects.pdf>

Pesticide Environmental Stewardship – Pollinator Protection.

[www.pesticidestewardship.org/PollinatorProtection](http://www.pesticidestewardship.org/PollinatorProtection)

Pesticide Task Force of the North American Pollinator Protection Campaign (NAPPC) [www.Pollinator.org/nappc](http://www.Pollinator.org/nappc)

Pollinator Protection - EPA Actions to Protect Pollinators.

[www.epa.gov/opp00001/ecosystem/pollinator/risk-mgmt.html](http://www.epa.gov/opp00001/ecosystem/pollinator/risk-mgmt.html)

The Xerces Society for Invertebrate Conservation.

<http://www.xerces.org/pollinator-observation/>

USDA Report on the National Stakeholder Conference on Honey Bee Health, National Honey Bee Health Stakeholder

<http://www.ars.usda.gov/news/docs.htm>

<http://www.ars.usda.gov/news/docs.htm>

Disclaimer -The most reliable information, that was available at the time this information was compiled, is included. Due to constantly changing laws and regulations, Lincoln University Cooperative Extension can assume no liability for recommendations. The pesticide user is always responsible for the effects of pesticide residues on their own crops, as well as problems caused by drift from their property to other properties or crops. Always read and follow all instructions on the label.

## On Farm Readiness Review

By Lindsey Pender and Touria Eaton

Once you have completed your Produce Safety Alliance FSMA Grower Training, the next step is for an inspector, from the Missouri Department of Agriculture (MDA), and/or an area educator from Lincoln University or the University of Missouri, to visit your farm and conduct an On-Farm Readiness Review. This visit will give you an opportunity to see how your practices fit into the frame of FSMA Produce Safety Rule compliance. Should you have areas to improve on your practices; the inspector and/or the area educators can work with you to find solutions and improve your practices.

The OFRR is confidential. No notes will be taken off farm, and all forms and worksheets will be left with you. You can also schedule a follow-up visit to review any changes you've made.

Once you complete your review, provided you have no areas to improve on, you can consider yourself ready for regulatory inspections, which may be conducted by an agent from the Food and Drug Administration (FDA).

Missouri Produce Farmers must be in compliance with the FSMA Produce Safety Rule by the following dates:

**January 26, 2018:** for farmers making an average yearly gross produce income of \$500,000 or more

**January 28, 2019:** for farmers making an average yearly gross produce income between \$250,000 and \$500,000.

**January 27, 2020:** for farmers making an average yearly gross produce income between \$25,000 and \$250,000.

Lincoln University is available to answer questions and conduct farm visits with farmers seeking assistance. You can schedule an OFRR farm visit or request assistance by contacting Dr. Touria Eaton at (573) 681-5174 or at [EatonT@LincolnU.edu](mailto:EatonT@LincolnU.edu)

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## Celebrating Farmers' Success!

*By Richard Rickman*

Mary Pollock is an innovative farmer from Hayti, Missouri. She is an integral part of the LU Horticulture Program in the Southeast Missouri "Bootheel" region.

She has worked with Richard Rickman, a staff member of LU Horticulture Program, in Southeast MO, since the program began in the spring of 2015.

Mary has a real enthusiasm to learn the methods and "madness" of becoming a produce grower in this area. Being a former educator herself, she is dedicated to learning sustainable practices of production and protection of crops. She is anxious to attend workshops, trainings and seminars to further her understanding of what it takes to grow vegetable crops in the "gumbo" soil where she lives.

Mary regularly attends the Minority and Limited Resource Farmers and Producers Conference, annually conducted by LU Horticulture Program. She participated in high tunnel construction workshops, and the George Washington Carver Lectures at Tuskegee University, Alabama.

With the help of Richard, Mary applied for a High Tunnel to NRCS through NRCS EQUIP Program and was awarded one, with a monetary value of \$9,000. She plans to construct the high tunnel in the fall of 2018 and use it for production in the spring and summer of 2019.



*Mary using equipment to prepare the land for production*

## Upcoming Events and Deadlines

- September 12 Feasibility Study Workshop, Location TBD
- September 18-20 FSMA PSR training Charleston, MO
- September 25 SARE Grant Writing Workshop Cape Area
- October 18 SARE Research and Education Grant due
- October 24 SARE Partnership Grants due

## We thank our sponsors

The events and activities of Lincoln University Horticulture Program are possible because of the collaboration of our colleagues and partners, and because of the generous funding from USDA/NRCS; USDA/OAO; USDA/FSA; USDA/ Evans-Allen Research Program; USDA/OREI; MDA; and NC-SARE.

Thank you.