Down To Earth: Reports from the Field

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Innovative Small Farmers' Outreach Program (ISFOP) • Lincoln University Cooperative Extension

Using Buckwheat as a Cover Crop in the High Tunnel

By Miranda Duschack, Small Farm Specialist – East Central Region

High tunnels are prime real estate on the farm. For several reasons, the crops grown within this shelter are often of higher quality than their field-grown counterparts. First, moisture can be controlled through drip irrigation. Second, the plants are better protected from the damage caused by excessive rain, hail and wind. Third, in some cases, insect pests can be barred from entering. A commercial farmer keeps the high tunnel in almost constant production by fully using season extension methods. Such heavy use of the soil can reduce nutrient-rich organic matter in the beds. Small farmers usually add organic matter to the soil in two ways. Although the most common option is to add compost, the less costly option is to plant a cover crop in the high tunnel. As it decomposes, this cover crop adds organic matter to the soil in the high tunnel while also providing other benefits.

Cover crops are plants that are not grown to harvest or market but for their benefits to soil health. When planted in the field, the foliage and root structure of cover crops hold down precious topsoil. This can limit soil erosion by water and wind. Cover crops also control weeds by either out-competing or smothering them. The taproots (large main root from which smaller roots grow) of cover crops improve water infiltration through the soil. Perhaps the greatest advantage of cover crops is that they add nutrient-rich organic matter to the soil. Organic matter forms when

Buckwheat grown in the high tunnel is ready to be tilled in.

the cover crop is allowed to decompose. Any crop field or garden with an organic matter content of 4-8 percent will produce a much better crop than fields that are deficient in soil organic matter.

Many growers avoid planting cover crops in the high tunnel because it is often in continuous production. This is especially the case in the late fall and early spring. These are the traditional planting times for cover crops in outdoor fields. Taking the high tunnel growing bed out of production to plant cover crops could create financial trouble for the farmer. For farmers on tight planting schedules, buckwheat can provide a good option. Buckwheat can be planted as a cover crop between rotations of spring harvest and summer planting or summer harvest and fall planting. Buckwheat can be distributed, with moderate thickness, into the bed, raked, watered in and kept moist until germination. It germinates and grows fairly quickly. In a few short weeks, it could be three to four inches high. The farmer can turn it under at this point and still reap the benefits of added organic matter. But if it is possible to wait until the plant is larger, it will add more organic matter to the soil. Do not allow the buckwheat to set seeds. If so, it will reseed in the growing beds, which could cause problems. Allow the buckwheat

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Inside This Issue:

Food Waste Management – Part III: The Campus Kitchens Project

By Joyce Rainwater, Farm Outreach Worker

The first two articles of our food waste management series discussed how farmers and consumers can use simple solutions to reduce food wastage on-farm and in the home. This third and last article of the series (See *Down to Earth*, Vol. 6, Issue 3, page 5 and *Down To Earth*, Vol. 6, Issue 4, page 7) explores a project occurring on college campuses across the nation. It manages food waste and serves local communities. The Campus Kitchens Project helps student volunteers develop partnerships, recover food, garden, plan menus, run cooking shifts and organize drivers. Volunteers also learn about and teach nutrition education to children and families. The Campus Kitchens Project is a nationwide program based in Washington, D.C. that began at St. Louis University (SLU) in St. Louis, Missouri. Each project has the same model and mission; however, each location chooses how it structures the project to fit within its campus and community. SLU's project codirector, Moira Killoran, states that the original idea was to gather excess food waste from the campus dining halls. However, the dining halls were already doing a great job of managing their food waste and using the items they had for student meals. Therefore, SLU decided to gather most of their food from a local Trader Joe's® store. The store donates the food items that are close to their sell-by or "best by" date. They also donate

Moira Killoran, codirector of the Campus Kitchens Project, showing volunteers the pantry area.

Father and son volunteers cutting toppings for tacos.

slightly damaged items or foods that are overstocked from holidays or sales. Volunteers pick up these items two days per week and bring them to the SLU campus. They are stored in a residence hall kitchen. Also, added space has been made for storage and preparation for the Campus Kitchens Project.

People from all over campus and the community volunteer. Some come because a course requires service hours. Others choose to donate their time to help those in need. Community organizations from the area also volunteer. Many of the volunteers continue after they complete their required hours. These volunteers can become kitchen or meal delivery shift leaders who help in meal planning and direct other volunteers. The kitchen manager and Killoran teach new skills to the volunteers. Volunteers are trained to use their five senses to inspect the food items before they are used for the meals that will be delivered to local clients. Each volunteer is also given basic food handling safety instructions. Kitchen volunteers wear gloves and a hairnet and follow washing procedures.

The project at SLU serves 450-475 meals each week to nine agencies, all within two miles of campus. A meal usually includes a protein, starch, vegetable and a fruit/dessert item. Meals are either served buffet style or are individually packaged by volunteers. Since this project relies on donated food, each meal is planned based on the donations. The food must be available in a large enough quantity to serve the number of clients in each location. For example, a large amount of lamb along with vegetables was made into tacos for one client. This provided about 40 meals to a low-income apartment for women and children. Each donated

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Food Waste (continued from page 2)

item is used to its fullest potential. Any waste is composted and recycled. Meals are cooked on Sundays, Mondays and Wednesdays by volunteers. Then, meals are packaged and delivered to clients.

Volunteers are always welcome and needed. Killoran is happy to train new volunteers. Email her at mkilloran@campuskitchens.org to volunteer or for more information. In addition to volunteering, you might consider starting your own Campus Kitchens Project at a school near you. To learn more about the Campus Kitchens Project, go to http://www.campuskitchens.org/. ■

Buckwheat (continued from page 1)

to decompose for at least 14 days before planting the cash crop. Periodic watering of the beds will speed up decomposition.

With all of its potential benefits, consider planting buckwheat as a cover crop in your high tunnel this year.

Bibliography

"Buckwheat for Cover Cropping in Organic Farming." eXtension.org. Last modified August 29, 2011. http://articles.extension.org/pages/18572/buckwheat-for-cover-cropping-in-organic-farming. ■

Todd Geisert Opens On-farm Store in Washington, Missouri

Todd Geisert

By Janet Hurst, Farm Outreach Worker

Todd Geisert is no stranger to farming. A fifth-generation pork producer, his grandfather attended the University of Missouri to study agriculture. The family farm has been in continuous operation since 1916. Tending the herds is still done by hand. Several generations of the Geiserts can be found in the field, helping to sort and feed the pigs, just as their ancestors did over 100 years ago.

The farm centers around natural pork production. Pigs are farrowed (born) in A-frame houses in fields where crops had been harvested during the prior season. This method of production creates rich soils for cropland.

For years, Geisert has routinely driven to St. Louis, Missouri, to provide pork to restaurants. He also runs a small farm stand on his land. Here, he offers pork products and fresh produce in season. It has been so successful that Geisert has started a full-blown grocery. Just down the road from his current farm stand, Geisert was able to secure a location for the new store, Farm To You Market. With more retail space, he has added many Missouri-made products. These include sauces, jams, spices, soup mixes, rice, chocolate, bread, cheesecake and potato chips. He also sells cheese, milk, bratwurst, pork cuts, bacon, beef, rabbit, chicken, turkey, eggs and many more Missouri-grown products. Fresh produce is available in season. The store serves as a showcase for Missouri products, including regional beer and wine. A central feature of the store is the certified kitchen and deli. The deli offers made-to-order sandwiches featuring high-quality meats and artisanal cheese.

Geisert continues to drive his route to St. Louis as well as to operate the farm stand. Recently, he started a wholesale food hub. A food hub is a relatively new concept. The hub makes it possible for Geisert to purchase locally grown goods from other farmers. He then includes these goods in his offerings to wholesale buyers, such as restaurants and buying clubs. The hub allows for the continued expansion of his business while also helping area farmers.

For more information on the Farm To You Market, call (844) 682-2266, visit http://farmtoyoumarket.com/, or find them on Facebook. Their address is 5025 Old Hwy 100, Washington, MO 63090. Geisert Farms can be found at www.toadspigs.com. ■

Sustainably Managing Your Woodlands

By Reneesha Auboug, Farm Outreach Worker – East Central Region, and Dr. Ajay Sharma, Assistant Professor of Forestry, Lincoln University Cooperative Research

As a private woodland owner, are you managing your forests? Missouri has more than 15 million acres of forests or woodlands. Eighty-four percent of these are privately owned by about 339,000 people or families. If you are like most Missouri family forest landowners, your land might be stagnant and unmanaged. Less than 10 percent of these landowners have made plans for their woodlands. Many believe passive management (letting nature take its course) is the best option. This is not true because your woodlands are constantly changing. Without sustainable management, your trees can be harmed by a number of factors. These include insects, diseases, invasive species, weed trees, wind damage, climate change and fire hazards. Your woods can also be a threat to public safety. Now is the time to protect, restore and ensure the future health of your woodland's trees, water, soil, native plants and wildlife. Woodland management also protects your family. No matter how many acres you own, the decisions you make (or DO NOT make) today have long-term consequences that will affect your property and those of your neighbors. So, how can you make wise decisions about your woodlots to benefit your business, the environment and your community?

What is Sustainable Forest Management?

The United Nations Food and Agriculture Organization (FAO) defines sustainable forest management to include maintaining "their biodiversity, productivity, regeneration capacity, [and] vitality" without harming other ecosystems. Good forest management involves three aspects: establishment, care and harvest.

Envision Your Long-term and Short-term Goals

To create realistic woodlot management goals, you must assess your situation now, consider future goals, and then plan how to reach them. Perhaps you want to maintain wildlife habitat and promote biodiversity (variety). Maybe you would like to prevent wildfires or produce wood products. Your goals might be to provide a space for tourism or recreation and/or increase the capital value of your woodland. But you must first evaluate the current structure of your forests. Here are some questions to consider: What species of trees are on my property? What are the most important trees on my land? What pests and diseases might affect my trees? How many trees do I have and what is their rate of growth? How old are they? What type of soil do I have? Are there problems related to a nearby road system? For the average person, answering these questions can be daunting.

Your woodland is complex. Answering the questions above requires knowledge and understanding about many subjects. Specific management will differ based on woodland types. It can also vary for different tracts of the same type. Without the necessary input, a management plan can lead to disaster. It can take decades to correct the damage. For this reason, you should seek the advice and help of a certified professional forester. After you define your goals, the forester will guide you to reach your objectives.

The Certified Professional Forester

Certified professional foresters know the art and science of forestry. Most have many years of experience. For instance, if you are interested in harvesting timber (one of the best management practices), the professional forester will help you with the following:

- Conducting an inventory for harvest and value appraisals.
- Developing a forest management plan based on your objectives.
- Providing marketing assistance in selling trees (e.g., in bidding, sales contracts, etc.) and giving knowledgeable advice about tree planting or thinning, or timber stand improvement.
- Offering information and advice about timber taxation.
- Assessing value for estate establishment or settlement.
- Helping to market specialty products obtained from your woodlands.
- Assessing the environmental impact of timber harvesting.
- Assisting with other specific, woodland management needs.

If you want to start sustainably managing your woodland, you might be worried about the costs.

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Woodlands (continued from page 4)

Funds are available through a variety of cost-share programs. Cost-share programs will not allow you to sell timber; however, they can give you a base to develop a future, noncommercial, timber management plan or timber harvesting plan. Material that is 10 inches or less in diameter is considered noncommercial and might qualify for cost share. A cost-share program can help you do important things that are needed for forest management but that are not directly related to timber harvesting. These practices include planting trees, thinning trees and erosion control. There are many cost-share programs with different terms. The shared cost is normally from 50 to 65 percent.

Take pride in your woodlands. Pass them on to the next generation. Plan now to manage your woodlands sustainably. Human and animal lives depend on trees. We cannot afford to let them die.

The following are some useful resources to assist you with timber harvest and woodland management:

American Forest Foundation. "My Land Plan: The Woodland Owner's Resource." Accessed June 30, 2016. http://mylandplan.org.

Forest & Woodland Associates of Missouri. http://www.forestandwoodland.org.

Missouri Consulting Foresters Association. "Find a Consulting Forester." Last modified June 30, 2016. http://www.missouriforesters.com/searchMCFA.php.

Selzer, H. E. "Forestry Assistance for Landowners." University of Missouri Extension. Last modified January 2015. http://extension.missouri.edu/p/g5999. ■

Jenna Wilkins

Meet Our New Small Farm Specialist, Jenna Wilkins

Jenna Wilkins began farming in 2008. She worked on a two-acre, certified organic farm in Kansas City, Kansas. It was her first job after high school. She learned the basics of vegetable production on small acreages and high tunnel production. She also became familiar with selling through farmers' markets and Community Supported Agriculture (CSA). Since then, Wilkins has grown food on vacant lots throughout Kansas City, Missouri. She sold the surplus at various farmers' markets. In 2014, she helped found the Northeast Farmers' Market in Northeast Kansas City, Missouri, where she lives. There, she works with farmers and an ethnically diverse community. This work required her to study the business side of farming. She also had to coordinate with growers and customers to foster healthy relationships.

Having grown up in Kansas City, Missouri, and taken part in its local food movement for several years, Wilkins is excited to become a Small Farm Specialist. She joins the Lincoln University Cooperative Extension's (LUCE) Innovative Small Farmers' Outreach Program (ISFOP) team in the West Central Region. Wilkins looks forward to working with rural and urban farmers in Jackson County. She will coordinate efforts within the region to increase both the production of quality foods and farmers' incomes. If you need farm or farming-related information or help, please call Jenna Wilkins at (816) 896-7078. ■

Controlling Cucumber Beetles in Small Farms and Gardens Using Mass Trapping

Dr. Jaime Piñero, State Extension Specialist — Integrated Pest Management

Spotted cucumber beetle.

Striped cucumber beetle.

Cucumber beetles are major insect pests of cucurbit crops (zucchini, squash, cucumber, watermelon, etc.) in the Midwest. Without proper management, adult beetles can transmit bacterial wilt, a disease that kills infected plants. Adult beetles also defoliate (remove the leaves from) plants and cause surface damage to fruits. Larvae (young) of the striped beetle harm plants by feeding on roots and stems.

It can be hard to manage these two pests in gardens and on small farms. Insecticides can be an effective control option. However, consider their potential impact on human safety and on beneficial insects, including pollinators. Many of these insecticides are restricted for use meaning they require private pesticide applicator training and licensing.

To address these concerns, the Lincoln University Cooperative Extension (LUCE) Integrated Pest Management (IPM) program developed a simple, mass trapping system. It has proven to be an effective IPM strategy. When used in the cucurbit field, cucumber beetles are drawn to the traps and away from the cash crop. Upon entering the trap, the beetles are killed when they eat the carbaryl-laced bait (a general use organic pesticide that acts primarily as an insecticide). This mass trapping system can be used on small farms or in home and community gardens.

The three sections of the trap are (1) a juice/milk jug, (2) a commercial, floral-based lure, and (3) a stun pill composed of carbaryl (Sevin®), paraffin wax and powdered buffalo gourd. Additional trap details are provided in the section: "Trap Construction Using a One-gallon Milk or Juice Container."

Research conducted over a four-year period indicates that the mass trapping system can kill thousands of cucumber beetles in a few weeks. This produces acceptable beetle densities in the cash crop. For example, in 2011, 28 baited traps killed 2,531 cucumber beetles in a watermelon crop in just nine days. In 2015, 28 traps killed 3,715 cucumber beetles (total of striped and spotted) over an eight-week period (May 21-July 9). Very few adults were found on the zucchini and cucumber plants. Across the entire trapping period, for each cucumber beetle found on a plant, there were 26 cucumber beetles killed by a trap. In 2016, 15 traps killed 3,217 striped cucumber beetles in a six-week period (April 29-June 14). Table 1 (below) gives the combined beetle counts for the 15 traps. It also displays the average number of beetles killed by traps and seen on plants. It shows that many more cucumber beetles were captured by traps, compared to the number of beetles seen on plants.

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Table 1. 2016 data for 15 cucumber beetle traps

DATE	Total no. striped cucumber beetles	Average no. striped cucumber beetles per trap	Average no. striped cucumber beetles per plant	Ratio beetles on traps/ beetles on plants
April 29-May 12	1,632	108.8	11.9	9.1
May 13-17	579	38.6	3.7	10.4
May 18-22	141	9.4	1.3	7.2
May 23-31	501	33.4	2.9	11.5
June 1-6	176	11.7	0.5	23.4
June 7-14	188	12.5	0.75	16.7
Total captured	**3,217**			

Controlling Cucumber Beetles (continued from page 6)

Overall, these results show that odor-baited traps have the potential to keep cucumber beetles below the economic threshold (the density of beetles at which an insecticide application is justified). In 2016, producers in a some Missouri locations are currently assessing the performance of this mass trapping system.

The new mass trapping system developed by the LUCE IPM program can be used as part of a broader IPM program aimed at managing cucumber beetles.

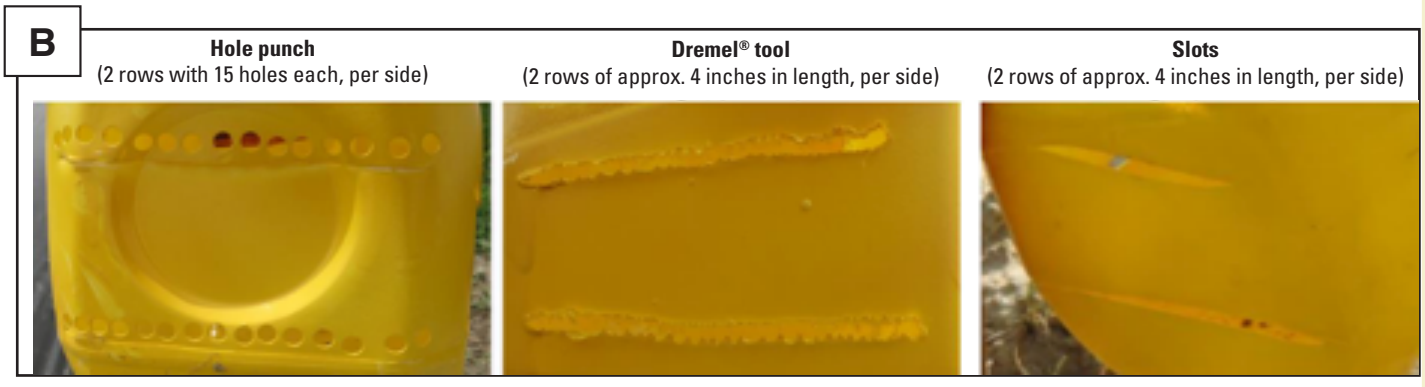
Trap Construction Using a One-gallon Milk or Juice Container

Step 1: Trap entrances can be a series of round holes made by a paper punch tool or horizontal slots cut with a knife or Dremel®-type power tool. If using the hole punch method, an initial horizontal knife cut provides access for the tool. Entrances on all sides of the container help to disperse the lure's scent. Because the scent can also attract honey bees, keep the entrance small enough to exclude them but still allow access to the cucumber beetle. A hole diameter or slot width of 1/4" maximum works well.

Step 2: Drop the stun pill into the trap. Unfold the scent lure and attach a short piece of string or wire. Remove the two protective white flaps (see photo, below) to aid in scent dispersal. Insert this through the mouth of the trap. Then, catch the string under the screw-top lid so that the lure is suspended inside the trap.

Step 3: Drive a post along the edge of a vegetable row. Using additional wire, suspend the trap from the container handle so that the trap is upright, about 4-6" above the ground.

Step 4: Use yellow, high-gloss paint to spray the traps. This has proven to increase effectiveness. Once installed, traps can easily be spray-painted in place.



(A) View of the cucumber beetle mass trapping devices deployed in a summer squash plot in Truxton, Missouri, **(B)** entrance holes for cucumber beetles can be made using a hole punch, a Dremel® tool or a knife. The best design is the hole, with slots as the second choice.

The commercial scent lure is produced by AgBio, Inc., 9915 Raleigh Street, Westminster, CO 80031; (303) 469-9221; agbio@agbio-inc.com. The stun pill can be purchased from Trécé, Inc., 7569 OK-28, Adair, OK 74330; (918) 785-3061; custserv@trece.com. ■

About Our Program...ISFOP

If you are a small farmer and need information, please contact an ISFOP Farm Outreach Worker (FOW). FOWs live and work in your community. They can provide information on ways to better manage your resources, reduce expense and increase income. They can also provide information on other programs and resources that may increase your income and the overall quality of life for you and for your family.

You are eligible to participate if you meet the following requirements:

- ☑ Your family lives on a farm, rural or urban.
- ☑ Farm products or income from the farm are necessary for you to live where you do.
- ☑ Your family provides the management and most of the labor for your farm.
- ☑ Your total annual family income is less than $50,000.

East Central Region:

- **Miranda Duschack**
  Small Farm Specialist
  St. Louis County and City
  DuschackM@LincolnU.edu
  (314) 604-3403

- **Janet Hurst**
  Farm Outreach Worker
  Franklin and Warren County
  HurstJ@LincolnU.edu
  (660) 216-1749

- **Joyce Rainwater**
  Farm Outreach Worker
  Jefferson and Washington County
  RainwaterJ@LincolnU.edu
  (314) 800-4076

- **Reneesha Auboug**
  Farm Outreach Worker
  Lincoln and St. Charles County
  AubougR@LincolnU.edu
  (314) 838-4088

West Central Region:

- **Jenna Wilkins**
  Small Farm Specialist
  Jackson County
  WilkinsJ@LincolnU.edu
  (816) 896-7078

- **Phillip Boydston**
  Farm Outreach Worker
  Cass and Johnson County
  BoydstonP@LincolnU.edu
  (816) 726-7720

- **Susan Jaster**
  Farm Outreach Worker
  Lafayette and Ray County
  JasterS@LincolnU.edu
  (816) 589-4725

- **Jim Pierce**
  Farm Outreach Worker
  Clay and Platte County
  PierceJ@LincolnU.edu
  (660) 232-1096

Southwest Region:

- **Nashon Bishop**
  Small Farm Specialist
  Barry and McDonald County
  BishopN@LincolnU.edu
  (417) 846-3948

- **Stephen "Randy" Garrett**
  Farm Outreach Worker
  Newton and Jasper County
  GarrettS@LincolnU.edu
  (417) 850-9391

- **David Middleton**
  Farm Outreach Worker
  Lawrence and Greene County
  MiddletonD@LincolnU.edu
  (417) 466-8056

LINCOLN UNIVERSITY MISSOURI
COOPERATIVE EXTENSION

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Pamela Donner, Coordinator and Senior Editor
Nancy Browning, Assistant Editor
Cherilyn Williams, Graphic Designer
Yuki Teramoto, Multimedia Technician
Andrew Erb, Video Conference Technician
Bené Williams, Web Designer

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ISFOP Office Staff:

- **Dr. K.B. Paul, ISFOP Director**
  PaulK@LincolnU.edu
  (573) 681-5584

- **Erin Brindisi, Secretary**
  BrindisiE@LincolnU.edu
  (573) 681-5312

For general information, call the LUCE ISFOP office at (573) 681-5312.

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