

# Innovative Small Farmers' Outreach Program (ISFOP): West Central Region

## Building a Low Cost Cold Room

By Nahshon Bishop, LUCE 2501 Program Educator, Southwest Missouri



A cold room stores fresh produce and supplies at low temperatures. It is a valuable tool for today's small farmers.

These cold rooms ensure slower respiration rates of raw fruits and vegetables; thus, they extend freshness and shelf life. This simple step reduces waste through the growing season. It also makes fresh and more nutritious foods available to customers. Because the customers can buy fresh, high quality produce, they are satisfied with the grower and often will become repeat customers. This benefits the grower with a solid customer base, less waste and a higher profit margin.



Dave Brown of Brown's Berry Farm in his Cold Room with the CoolBot™ and air conditioning unit.

(continued on page 2)

Down to Earth: Reports from the field

## In the Spotlight: Rocky Creek Valley Farm

By Susan Jaster, Farm Outreach Worker

If you have a road map then you know what direction to travel even if you have to take an unexpected detour. Rocky Creek Valley Farm, in Rayville, Missouri is a great place to take a detour if you want to learn about herbs, need some eggs or vegetables. They offer tours of their farm on Wednesdays (if you call ahead), teach herb classes, and sell eggs and vegetables at the farm stand.

When Gary and Elizabeth Wenig purchased their 40 acres in 2010, U-pick strawberries were going to be a big part of their plan, especially because of its location right off of a paved road. But when the road district poured gravel on top of the surface, Gary knew there would be too much gravel dust for customers to enjoy picking the lovely red fruit. The Wenigs spent some time trying to resolve the road issue to no avail. In the spirit of all resilient farmers, their plan had to change direc-

tion. Their ultimate goal is to create a permaculture style farm with direct sales to customers who come to the farm. So they carry-on, working in that direction, without the U-pick strawberries.

They now have 2.5 acres in vegetable production grown in accordance with the Biodynamic sowing and planting techniques. Biodynamics is a spiritual, ethical, and ecological approach to agriculture. When practicing Biodynamic, planting and seeding are (continued on page 3)



Gary Wenig uncovering a bed protected by row cover. The structures seen here are often referred to as low tunnels.

Inside this issue:	PAGE
Building a Low Cost Cold	1 & 2
Rocky Creek Valley Farm	1 & 3
IMP Corner: Plant Pathology	3 & 4
About ISFOP	4

## Cold Room . . . (continued from page 1)



*CoolBot™ system hooked up to an AC unit in the Cold room (top). The CoolBot™ unit displaying the temperature inside the room (right).*

Despite its many benefits, small farmers often will not build a cold room because of the cost. An 8' x 8' cold room usually needs a commercial compressor. These units can cost more than \$2,000. With today's uncertain economy, many small farmers are unwilling to make this investment for a small cold room.

However, there is a new device that solves the cost problems of building a traditional cold room. This device is a CoolBot™. It can lower the temperature of a well-insulated room to 35°F. Another reason to get excited about this device is its cost. At \$299.00, you will pay only a fraction of the price of a commercial-scale compressor and cooling unit. The CoolBot™ is a simple, small, plastic unit. It allows a standard window air conditioner (AC) to reach very low temperatures. The CoolBot™ also continually monitors the fins of the AC to keep them from freezing.

In Southwest Missouri, several CoolBot™ units have been installed in the past few years. One belongs to a Lincoln University Cooperative Extension (LUCE) farmer-collaborator, Mr. Nhia Xiong.

Xiong lives and farms in Anderson, Missouri. He has come to depend heavily on his CoolBot™ to cool produce. Over the past three years, Xiong has earned an extra \$4,000 - \$5,000 per year in sales. This resulted from the increased amount of produce he was able to keep fresh and sell. Mr. Xiong keeps his cold room at 42°F in the summer; there he stores salad greens, spin-

ach, cucumbers, zucchinis and squash. Speaking about his CoolBot™, Xiong stated with a smile, "It has made a big difference."

David Brown of Brown's Berry Farm in Miller, Missouri, planted three acres of

strawberry runner tips for fall annual production. He needed a cool place to store the runner tips; hence, he began to build a cold room in the summer of 2012. Brown said, "You can use the room for so many things besides cooling produce, cuttings or tips." The room is now being used to store fertilizers, fungicides and other high-value products that must be kept at a certain temperature in the winter. "With very few carpentry skills, a person can construct one of these rooms and cool it for the price of a single commercial compressor," said Brown. The room that Brown built was about 12' x 12'. The walls and the ceiling were covered with two sheets of 4' x 8' one-inch foil faced insulation. David also made sure to cover the floor. He laid down 4' x 8' sheets of insulation boards; these were covered with plywood. Covering the floor ensures a more stable temperature. In this way, produce can be cooled evenly and more efficiently. According to Brown, "Most people do not consider the flooring when they think about insulating a building, but this is

where you lose most of your cold air." Brown stated that building a cold room in the summer had its challenges: "When we built this cold room, Southwest Missouri was in the middle of a record heat wave and drought. We could not find a window unit in our area." Brown is satisfied with the ease of the installation and set up. He said, "Anyone can do this. I highly recommend visiting the CoolBot™ manufacturer's website. A lot of the information there is very easy to understand. It's helpful when beginning the process of building your own cold storage room." ■

### **MORE INFORMATION:**

In July 2012, after listening to success stories like these, the University of Missouri's Southwest Research Center installed a cold room; it is equipped with a CoolBot™.

Below is a list of the materials used to build the cold room at the Southwest Center. This list is meant as a guide. However, keep in mind that the total cost will vary depending on location, room size, material costs, structural details and the expertise of the person building the room.

#### Materials List:

22 sheets of 1" Foil Faced Perma "R" 4' x 8' insulation: \$286.00

1 large 18,000 BTU window air conditioner unit: \$499.99

1 CoolBot™: \$299.00

Electrical Supplies: \$150.00

Hardware Supplies: \$60.00

Misc: \$100.00

Total Expenses: \$1,395.00

CoolBot™ Website: <http://storeitcold.com/howitworks.html>

If you would like to see the cold room at the Southwest Center or have additional questions, please contact Nahshon Bishop at [Bishop@LincolnU.edu](mailto:Bishop@LincolnU.edu) or (417) 846-3948.

## Rocky Creek . . . (continued from page 1)

timed by the phases of the moon and planets in the solar system. The Biodynamic Sowing and Planting Calendar by Maria and Mathias Thun published by Floris Books is a guide that the Wenigs use daily. They experiment with many different planting techniques using nine raised beds equipped with low tunnels, and three Hugelkultur mounds. Hugelkultur is the strategic layering of tree trunks, limbs, branches, and soil, creating a mound to allow elevated growing while the wood acts like a sponge to retain moisture. In side-by-side comparisons, the Wenigs are satisfied that following Biodynamic principles and practices give their plants more growth and vigor. Last year, with the challenge of the drought, they found that the one experimental Hugelkultur mound had good production in spite of the heat, which merited two more mounds for this season. Like many growers, experimentation is all part of the game. Gary and Elizabeth will continue their on-farm research this season implementing their Farmer/Rancher SARE grant they received this year. In it, they will be focusing on Integrated Pest Management strategies (IPM) to control squash bugs by using a trap crop.

Many of the squash planted last season were eaten by thousands of squash bugs. With the help of Lincoln University's IPM Specialist, Dr. Jaime Pinero, and their Farm Outreach Worker, Susan Jaster, Gary and Elizabeth created a plan to prevent devastating crop injury from squash bugs. They intend to use their SARE grant funds to research the use of Blue Hubbard squash as a trap crop growing inside a

chicken tractor. The trap crop will attract the squash bugs which will subsequently be eaten by the chickens, thereby preventing the bugs from spreading to their squash cash crops. Elizabeth has some well trained chickens to use in the special chicken tractors that Gary designed for this project.

Rocky Creek Valley Farm hens produce good quality eggs and Elizabeth makes sure that her birds are fed well and protected from predators like Red-tailed hawks and fox which have had their way with the flock in the past. Her chickens are truly a free-range roaming flock with the freedom to explore every nook, but when Elizabeth calls out, they all come running to their coop. Each evening the birds come back to their coop to be locked in for their own protection. When it comes time for the chicken tractor to move to a new site and after Gary does a "bug count" for the research project, two chickens will be selected, in turn, to eat all the squash bugs from the Hubbard squash.

Gary, an engineer, and Elizabeth, a certified clinical herbalist, keep many logs and farm records daily. Elizabeth remarked, "It's like brushing your teeth, it is a habit; you need to make it easy and keep charts close at hand." Keeping good records allow them to manage what they measure and stay within their farm budget. Gary has created pages of "mathematical formulas for farmers", gestation tables, and lum-



Gary and Elizabeth Wenig in front of the chicken tractor that will be used for the SARE Grant funded IPM.

ber price lists which are kept in his journal along with other information collected daily. Elizabeth logs in the quantity of milk that her goats produce, their reproduction cycles, number of eggs from the hens, the local weather conditions, including high and low temperatures for the day. They use these records to help them create a holistic approach to growing produce on their farm sustainably.

They sell their products and advertise their medicinal herb classes at Badseed Farmers' Market in Kansas City, at their self-serve road side stand, to their CSA (Community Supported Agriculture) customers, and on their website: [www.rockycreekvalley.com](http://www.rockycreekvalley.com).

If you would like to take a farm tour, please call first and come out on a Wednesday, between 1 pm and 4 pm, buy some eggs and vegetables, or take an herb class. Look out for details about their SARE grant project and high tunnel building project on their website. ■

## IPM CORNER: Preventing and Diagnosing Ailments on Vegetables and Small Fruits

By Dr. Zelalem Merasha, LUCE State Extension Specialist—Plant Pathology

Crop diseases are one of the main challenges that a farmer or a home gardener faces. Plants can become sick from non-contagious or contagious diseases. Non-contagious diseases can be caused by a lack of proper nutrition; they can also be caused by bad weather or soil conditions. Contagious diseases are those that are the result of infections. These infections can be by fungi, bacteria, nematodes (roundworms) and viruses. To diagnose

an unknown ailment on a plant, first try to recall all of the recent events and practices on your farm and nearby (e.g., spray drift). Also review the past and present weather conditions. Your diagnosis will come when you match the current problem with any previous symptoms or signs. If you cannot, the next step is to take a few well-focused photographs of the affected plant and plant parts. Take a few aerial photos and some at the ground

level. Then contact your local extension educator for advice. The other option is to properly pack and send samples to one of the plant diagnostic labs listed in the highlighted box.

There are three elements that must be present for a contagious disease to occur. First, there must be a susceptible host. Second, there must be a virulent pathogen.

(continued on page 4)

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 your family.

## You are eligible to participate if:

- 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.

## How to Contact

### West Central Regional ISFOP Farm Outreach Workers:

- **Katie Nixon**, West Central Regional Coordinator and Jackson County  
[NixonK@LincolnU.edu](mailto:NixonK@LincolnU.edu)  
(816) 809-5074
- **Jeff Yearington**, Cass and Johnson Counties  
[YearingtonJ@LincolnU.edu](mailto:YearingtonJ@LincolnU.edu)  
(816) 899-2181
- **Susan Jaster**, Lafayette and Ray Counties  
[JasterS@LincolnU.edu](mailto:JasterS@LincolnU.edu)  
(816) 589-4725
- **Jim Pierce**, Clay and Platte Counties  
[PierceJ@LincolnU.edu](mailto:PierceJ@LincolnU.edu)  
(660) 232-1096

### For general information

call the LUCE ISFOP office at (573) 681-5312.



## Cooperative Extension

Box 29

Jefferson City, MO 65102-0029

Lincoln University in Missouri, and the U.S. Department of Agriculture Cooperating. Yvonne Matthews, Interim Dean, College of Agricultural and Natural Sciences. Distributed in furtherance of the Food and Agricultural Act, 1977 PL 95-98. Dec. 22, 1981.

Publications are distributed without regard to race, color, national origin, sex, age, religion or handicap.

### Lincoln University Cooperative Extension (LUCE)

#### ISFOP Campus Staff

- \* Dr. K.B. Paul, ISFOP Director
- \* Vonna Kesel, Program Secretary

Publications are available upon request.  
Contact Pamela Donner, Media Center  
Coordinator and Senior Editor



**Mulching:** a common and popular practice helps in conserving soil moisture, suppressing weeds and curbing the spread of diseases.

If you have any questions that relate to plant diseases, please call Dr. Mer-sha at (573) 681-5634 or email

[MerashaZ@LincolnU.edu](mailto:MerashaZ@LincolnU.edu)

## IPM Corner. . . (continued from page 3)

Third, there must be a favorable environment. One way to lower the chance of disease is to start with a resistant variety. Also try to modify the growing location in favor of the crop. However, invisible microbes are everywhere. Often, an environment which favors the crop also favors the unwelcome organisms (pathogens). One should always be vigilant; use proactive and eco-friendly methods. Also, use the least harmful strategy to target the pathogen.

Here is a list of tactics that a grower should use to decrease the problem of diseases.

One method is crop rotation. Use resistant varieties of planting materials (seeds, transplants or cuttings), if they are available.

Good sanitation is needed; keep your farm clean. Also, scout the farm regularly. This will help you to detect and treat quickly. Follow best management practices (e.g., mulching). Apply pesticides responsibly. Use the "integrated disease management" technique; this means combining two or more of the above methods. Remember that there is no single solution for any crop disease. You must be extra vigilant against the outbreak of disease. By taking the proper measures to prevent and control diseases, you can reap a bountiful harvest. ■

## Contacts for Disease Diagnosis

Your local contacts include regional and/or state extension specialists at Lincoln University; University of Missouri, Department of Agriculture; or Kansas State University. OR you can send your properly packed samples to one of the following plant diagnostic labs. It is always helpful to call first to learn how to package and ship the samples.

### Kansas State University, Plant Disease Diagnostic Lab

4032 Throckmorton PSC, Manhattan, KS 66506; Phone: (785) 532-5810; Email: [clinic@ksu.edu](mailto:clinic@ksu.edu)

### University of Illinois, Plant Clinic

1102 S. Goodwin Ave., S-417 Turner Hall, Urbana, IL 61801; Phone: (217) 333-0519; Website: <http://web.extension.illinois.edu/plantclinic/>

### Iowa State University, Plant and Insect Diagnostic Clinic

327 Bessey Hall, Ames, IA 50010; Phone: (515) 294-0581; Email: [pidc@iastate.edu](mailto:pidc@iastate.edu)

### University of Arkansas, Plant Health Clinic

2601 N. Young Ave., Fayetteville, AR 72704; Phone: (479) 575-3189 or (479) 575-2727; Email: [ssmith@auex.edu](mailto:ssmith@auex.edu)