



# Innovative Small Farmers' Outreach Program (ISFOP): WEST CENTRAL REGION

## Innovation Circle: The Noble Pigeon

By Jim Pierce, Farm Outreach Worker

For agriculture to be successful, it must be sustainable. In simple terms, sustainable agriculture produces food, fiber, plants and animals using methods that protect the environment, public health, human communities and animal welfare. Using this form of agriculture enables healthy food to be produced profitably without harming the environment. It also allows future generations to do the same.

Before trying a new practice, farmers should consider whether the change positively impacts the three facets of sustainability: the environment, the community and the economics of the farm.

Whether you raise fruits, vegetables or animals, soil is the single asset on the farm. Therefore, it is vital to maintain and improve the fertility of soil to obtain robust yields. There are several common practices for dealing with fertility; these are compost, green manure crops, livestock manure and chemical fertilizers. Another method that has been practiced for centuries to maintain and contribute to soil fertility relies on the natural behaviors of pigeons (a bird that exists around the world). Pigeons eat insects, seeds and forages. Past civilizations have

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**Pigeon Tower**

Photo from <http://www.fao.org/docrep/004/y0501e/y0501e07.htm>  
Food and Agriculture Organization of the United Nations

# Down to Earth: Reports from the Field

## In The Spotlight: Third Day Organics

By Susan Jaster, Farm Outreach Worker

Third Day Organics is beginning its first year of production with 6.7 acres of vegetables, lavender, sweet corn and cage-raised catfish. At this point, 6.7 acres has been certified organic, with the goal of certifying the entire 78-acre farm as organic.

When owner Richard Pember was a boy, he dreamed of owning a small farm. He earned a bachelor's and master's degree in mechanical engineering. Then he joined the US Army®; he remains active in the Army® Reserve. Pember also worked in the construction business. His childhood ambitions stayed alive as his passion for gardening grew. He turned his ideas and pas-

sion into reality and now owns a farm in Odessa, Missouri. However, fulfilling a dream takes skill. Pember knew he needed more information and help to be successful at farming. After researching, Pember learned that sustainable and organic farming could potentially make the most money for him.

Some of his farmer friends directed him to the United States Department of Agriculture (USDA)/Natural Resources Conservation Service (NRCS). They assisted

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*Third Day Organic Farm pond where Richard plans to begin work with aquaculture.*

## In the Spotlight...(continued from page 1)

him in pond construction and repairs and taught him about the soil on his farm. They mapped out areas of his farm that would be suitable for certain uses, such as a high tunnel. Pember also contacted Lincoln University Cooperative Extension's (LUCE) Innovative Small Farmers' Outreach Program (ISFOP) staff member, Susan Jaster, Farm Outreach Worker – Lafayette and Ray County.

After visiting the farm and understanding Pember's goals, Jaster offered advice. For example, Pember could use the pond for aquaculture. Jaster made an appointment for Pember to meet with Dr. Jim Wetzel at LU's new aquaculture research facility at George Washington Carver Farm in Jefferson City. Wetzel looked at the aerial maps of the farm to see if the ponds could support cage fish. He suggested breeds of fish, cage construction and organic feed. To

prepare for his new adventure, Pember attended workshops and conferences including the Plant Propagation Workshop, Wholesale Success Workshop for Fruit and Vegetable Growers and the Missouri Organic Association Annual Conference.

Pember ordered seeds from a reputable organic seed supplier. He bought organic growing media, lots of seed trays and a few pizzas to feed his helpers. Pember found there is a learning curve to growing vegetables. He discovered that when starting plants indoors, they must be near a light source. Also, watering hundreds of plants in your basement is very messy.

Since most of his land had been in pasture for many years, it was challenging to open it up to grow vegetables. The biggest problem was likely to be weeds. To foster networking, Jaster introduced Pember to other nearby farmers. One of the farmers had a plastic mulch-laying machine for rent; he taught Pember how to use it. Another farmer took Pember on a tour of his organic farm. He showed Pember about tilling and preparing the soil, keeping records for organic certification and post-harvest handling.

Although Pember thought he was ready, the spring weather was a bit uncooperative. Often, it was too warm, rainy, windy or cold. Finally, there were dry days when Pember could plow and disk the ground. Because he is growing on

a slope, and erosion could pose a big problem, other farmers advised not to plow all of the ground at once. Instead, Pember tried strip-tilling. This means only tilling the areas he was going to plant and leaving the pathways covered in pasture. After he plowed, the rains came; however, erosion was not an issue because of the strip-tilling.

Richard Pember and his wife, Eileen, worked very hard to lay all the drip tape and plastic mulch in the strip-tilled beds. He installed his irrigation headers and tested them with his son's help. The beds are now ready for the growing season. Now the hard work begins!

Before Pember broke the ground, he already had buyers lined up and had formed a partnership with local growers. This was a very wise move. Come harvesttime, he won't be scrambling for a place to sell his produce. He knows what his buyers want and has planned accordingly. Now it is up to him and his family to make sure their produce grows abundantly. ■



*At Third Day Organic Farm plastic mulch was laid after strip-tilling.*

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● **The 22nd Annual Small Farm Trade Show and Conference** ●

● Thursday-Saturday, October 23-25, 2014 ●

● Midwest Exchange Regional Stockyards ●

● Mexico, Missouri ●

● Visit [www.smallfarmtoday.com](http://www.smallfarmtoday.com) for additional information. ●  
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## Meet Our New ISFOP Team Member: Phillip Boydston

Phillip Boydston is the new Farm Outreach Worker (FOW) for the Johnson and Cass County region. He grew up in the vicinity on a diversified family farm. It is located just south of Odessa, Missouri, where his family has resided for years. He earned a degree in agriculture from the University of Missouri. Then, Boydston gained experience with grazing and dairy operations in north Missouri. Later, he worked with the United States Department of Agriculture (USDA) programs and producers

in Lafayette County. After taking courses towards a master's in Extension education through Iowa State University, Boydston found his calling. He looks forward to using his experience in his new job with Lincoln University Cooperative Extension near his home area. In addition to his professional experiences, Boydston maintains a low-input grass-based herd of cattle and hair sheep. He also has a small garden, forage and row crop production. ■



*Phillip Boydston, Farm Outreach Worker for Cass and Johnson County, with his dog Gerty.*

## Noble Pigeon...(continued from page 1)



**Pigeon Tower**

From <http://www.fao.org/docrep/004/y0501e/y0501e07.htm> Food and Agriculture Organization of the United Nations

benefitted from the pigeon's behavior to form flocks that produce fertilizer. The

birds convert unusable foodstuffs into fertilizer that can be used to produce human foods.

In Isfahan, Iran, for example, pigeon towers were built in the 16th and 17th centuries. They provided housing for wild pigeons. Towers were 30 feet wide or more and 60 feet tall. These towers were built to help thousands of pigeons deposited much of their manure inside the tower. This allowed the manure to be removed efficiently. The towers dotted the agricultural landscape. The rich pigeon guano (bird excrement) was then applied to fields and orchards.

Pigeon manure is very rich in nutrient analysis. A single bird produces about six pounds of dry manure each year. The reported nitrogen (N) values of the dry manure vary from 4 to 6 percent; phosphorus (P) from 1 to 3 percent; and potassium (K) from 1 to 2 percent.

Let us accept that each bird produces about 6 pounds of dry manure (12 pounds, wet) per year. Also assume that the tower houses up to 1000 birds. In such a case, about three tons of dry manure would be produced

annually. From the table below, it can be seen that pigeon manure has NPK values of 4:1:1. This equals 240 pounds of N, 60 pounds of P and 60 pounds of K. With a 70 percent organic matter content, 2,400 pounds of organic matter would be returned to the soil.

Consider this question: "Could a pigeon tower be a part of a sustainable solution for replenishing and improving your soils?" Test your answer against the three dimensions of sustainability. It is very possible that a pigeon tower could have a place on your farm. ■

	Pigeon	Chicken
Average pH	6.12	6.42
Organic Matter (%)	69.8	62.7
Nitrogen (%)	4.31	3.03
Phosphorus	0.97	0.75
Potassium	0.98	0.89

Information to create the chart can be found in this article from the World Journal of Agriculture Science: <http://www.idosi.org/>

## IPM Corner: Crop Rotation Could Help Reduce Disease Incidence on Your Planted Crops

By Dr. Zelalem Mersha, State Extension Specialist - Plant Pathology

Crop rotation involves planning where to grow a crop in a given production area when transitioning from one harvest cycle to the next. There are three key reasons that growers rotate crops in their fields. First, it balances soil fertility by maintaining or improving the soil organic matter content. Second, it helps to reduce diseases and pests. Lastly, it controls soil erosion.

Growers usually know that continuous planting of crops from the same families on the same spot results in a buildup of plant pathogens (disease-causing agents). To reverse this situation and avoid pathogen buildup, wait at least three to five years before planting crops of the same family in the same location. When a non-host crop is planted, the pathogen germinates; however, it will not be able to penetrate, infect and reproduce. When denied its susceptible host, such an inoculum

(fungal or bacterial spore) gradually dies in the soil. Over time, the inoculum levels are greatly reduced.

Crop rotation can be an effective disease management tool, especially if the pathogen overwinters in crop residue or soil. It works less well for airborne foliar (leaf) diseases, such as powdery mildew or rusts. Also, this method works well when the pathogen causing the disease has a narrow host range, affecting only one or few plant families. The rotation plan will work even better if combined with very good sanitation. This includes proper removal of diseased plant residue and any alternate hosts of a disease (e.g., weeds). When planning alternating crops on a piece of land, remove any plant residue from the previous crop. Use of cover crops, including growing some brassica (of the family including broccoli, cabbage, radish, etc.), will also minimize soilborne diseases for the next



The LU IPM program has a new blog that provides farmers with timely and relevant information on Spotted Wing Drosophila and other insect pests that attack fruits and vegetables in Missouri:  
<http://www.LU-IPM.net>

season.

An effective crop rotation plan is often based on one of two options: botanical family or the plant parts that are eaten. Plants in the same family usually are prone to similar diseases and pests. As a general rule, crops in the same family should not follow one another in rotation. Rather than using botanical family, crops can be grouped based on their edible parts, such as fruit and seed, leaf and stem or root and bulb. This plan is

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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 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.

**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
- **Phillip Boydston**, Cass and Johnson County  
[BoydstonP@LincolnU.edu](mailto:BoydstonP@LincolnU.edu)  
(816) 726-7720
- **Susan Jaster**, Lafayette and Ray County  
[JasterS@LincolnU.edu](mailto:JasterS@LincolnU.edu)  
(816) 589-4725
- **Jim Pierce**, Clay and Platte County  
[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

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**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 at: [DonnerPJ@LincolnU.edu](mailto:DonnerPJ@LincolnU.edu)



United States Department of Agriculture

National Institute of Food and Agriculture

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

a simple and easy way to avoid any overlap of consecutive plants from the same family.

Here are some important aspects to consider for an effective rotation plan:

1. **Available space:** The area that can be allotted to each crop depends on the available space and on the nature of the crop.
2. **Growing season:** Cool-season crops need cool soil and air temperatures; they are grown in the spring or fall. They also tend to be shallow-rooted and susceptible to drought. They are usually cultivated for their leaves or roots. Warm-season crops need warm soil and air temperatures to germinate, grow and mature. They are deep-rooted and resistant to drought. These crops are usually raised for their seed or fruit. Alternating cool- and warm-season crops allows a producer to include a cover crop or grow multiple crops during the same growing season. For example, a cool-season pea could be followed by a buckwheat cover crop in summer. This could be followed by a fall planting of onions or radishes.
3. **Nutrient demands:** Having two nutrient-depleting (heavy feeding) crops follow one another robs the soil. It can result in poor yields. Heavy feeding crops should be sequenced with light feeders or a soil-building cover crop such as hairy vetch. Legumes are good to rotate after heavy feeding crops, such as sweet corn or tomatoes. Another example is growing the grass family (sweet corn), followed by the pea family (bean or pea), then the mustard family (cabbage, broccoli, mustard, radish) and finally the nightshade family (tomato, pepper, potato).

4. **Rotation length:** Flexibility can be built into longer rotations. For example, rotation periods of several years might be needed to suppress soilborne pathogens. Longer rotations also allow for perennial crops, such as grass or legume hay, to be added. This results in healthier soil; it builds organic matter and improves soil aggregation (allows soil particles to bind together to form granular structures).
5. **Rooting depth:** Take advantage of the variable rooting depth of plants in a crop rotation. Follow deep-rooted plants with shallow-rooted plants to allow for more complete use of the nutrients within the entire soil profile. For example, follow spinach (shallow-rooted) with potatoes (deep-rooted) or a rye cover crop. The table below gives the rooting depth of a number of vegetables. ■

Shallow (6-12 in.)	Moderate (18-24 in.)	Deep (> 36 in.)
Beet, Broccoli, Carrot, Cauliflower, Celery, Greens & Herbs, Onion, Pepper, Radish, Spinach	Cabbage, Brussels sprouts, Cantaloupe, Cucumber, Eggplant, Pea, Potato, Snap bean, summer squash, sweet corn, tomato	Asparagus, Lima bean, Sweet potato, Watermelon, winter squash