

Down To Earth: Reports from the Field

Innovative Small Farmers' Outreach Program (ISFOP)



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In the Spotlight: Golden L Creamery

By Janet Hurst, Farm Outreach Worker

Morning comes early at the Golden L Creamery. Between milking cows and making cheese, the Lavy family always has a full day ahead. But the Lavys are living their dream, so it's a labor of love.

Tim Lavy comes from a dairy background. His grandfather ran a dairy on the family farm in the 1940s. He delivered milk in glass bottles, door-to-door. Tim Lavy decided to carry on the family business and began to rebuild the dairy herd. The entire Lavy family, including Tim's wife Becky and their children, all pitch in to make the dairy work. The Lavys' parents are also involved with production.

It takes a lot to make a dairy farm run successfully. Twice a day, milking is on the schedule — 365 days a year. For the first few years of the dairy, Lavy sold milk to commercial buyers and expanded his herd. At one time, he was milking 180 head a day. The dairy was certified as organic, and that created problems. "We had a drought and had to buy organic hay," Lavy says. That quickly ate up all the profits. As the milk market changed, he decided to change with it. He dropped the organic certification and began to downsize with the thought of making cheese.

The Lavys began to explore the craft of cheesemaking, attending educational seminars and short courses. Becky states, "We did a lot of research before we jumped into cheesemaking. We started out making cheese in our own kitchen."



The Lavys proudly display cheese made at Golden L Creamery.

With the fluctuating milk market, cheese became the solution to several problems. By adding value to the milk, Tim could milk fewer cows. Extra milk could be made into cheese, allowing for long-term storage. A secondary market was developed, selling steers for beef.

The Lavys' cows are fed grass for as long as possible. They installed a fodder system and grow fresh fodder during the winter. The rich fodder produces great milk, rich in butterfat and perfect for cheesemaking.

Over the years, the Lavys developed an extensive customer list for raw milk. They deliver twice a week and have many on-farm customers. Many of the milk customers purchase cheese, too. Other market outlets include farmers' markets, retail outlets and several stores in Columbia, Missouri, including Clovers Natural Market and Lucky's Market.

The Lavys worked closely with cheese consultant Neville McNaughton to build their creamery and to learn to make specific cheeses. McNaughton is based in St. Louis and is internationally known for his expertise in cheese.

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Wild Leeks: A Potential Native Specialty Crop for Missouri

By Dr. Nadia Navarrete-Tindall, State Extension Specialist – Native Plants

Wild leeks (*Allium tricoccum*) or ramps are native edible plants. Their natural range extends from southern Appalachia to southern Canada. Leeks are seldom grown as crops. In Missouri, there are two species: *Allium tricoccum* and *A. burdickii* (Yatskievych 1999) (*image at right*). However, some botanists consider *A. burdickii* to be a variety of *A. tricoccum*. Both species are edible. They are consumed in the eastern U.S. and southern Canada (Davis and Greenfield 2002). In Missouri, neither species is very common. *A. tricoccum* is more abundant. However, it is more widely scattered than *A. burdickii* (Yatskievych 1999). *A. burdickii* bulbs are 1.5 to 4 cm long. Its leaves are 14 to 28 cm long and 2 to 4 cm wide. *A. tricoccum* bulbs are 2 to 6 cm long (*image on page 3, bottom left*). Its leaves are 15 to 40 cm long and 3 to 8 cm wide. Bulbs start to emerge by the end of March; leaves are fully grown by mid-April. By mid-to-late May, the leaves age. They turn yellow and disappear by mid-June. Inflorescences (flowering or blossoming) start forming in June. Flowers are fully developed by the end of July. Three globe-like seeds are produced per flower in the fall.

In Eastern states (for example, West Virginia and North Carolina) and in Canada, this plant is usually collected from the wild. Especially in Canada, this practice puts leeks on the list of species of concern. In 1994, the gathering of leeks from the wild was banned in Quebec (Bernatchez et al. 2013). There is a concern expressed by botanists and



Wild leek (*Allium tricoccum*) bulbs, one year old (top); two years old (bottom). New bulbs propagate naturally by forming a dense crown around the original bulb. New bulbs can be separated easily for propagation in early spring. Bulbs start growing by the end of March.

conservationists in Missouri that too many leeks are being harvested. Lincoln University Cooperative Extension's (LUCE) Native Plants Program (NPP) is conducting a study to discourage taking leeks from natural populations in Missouri. The study is funded by a Specialty Crop Block Grant from the Missouri Department of Agriculture (MDA) and the United States Department of Agriculture's (USDA) – National Institute of Food and Agriculture (NIFA). One main goal is to share knowledge about growing leeks as a specialty crop; another is to develop products to increase the value-added potential of leeks and other native perennial (plant with a life cycle of two or more years) edible plants. This study will also develop propagation protocols to grow leeks and wild greens as crops in

Missouri. (A propagation protocol lists all the steps needed to grow a plant, from collecting seeds or cuttings through shipping plants.)

The NPP staff is working with five small farmers located in the Missouri counties of Callaway, Cole and Scott. Together, they are evaluating three peat moss-free soil media, using organic fertilizer or compost in pots or raised beds. Other plants were sown in the field under the canopy of oak, hickory and other native trees. These are growing in two woodlands owned by Lincoln University. They are similar to the habitat of wild leek populations. Several other species are also being evaluated. These include cup plant (*Silphium perfoliatum*), golden glow (*Rudbeckia laciniata*)

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Wild Leeks (continued from page 2)

and nettles (*Laportea canadensis* and *Urtica dioica*). Studies conducted in Quebec (Davis 2002) and North Carolina (Bernatchez et al. 2013) suggest that wild leeks can be grown under the forest canopy or in the field with artificial shade. The results of this study will benefit urban and rural small farmers, seed and plant producers, market vendors and communities across Missouri.

This project is important and timely because of the changing weather patterns in the past few years. Native plants usually adapt to extreme weather conditions. By developing these perennial crops, farmers can reduce costs. Some of these plants are readily available on farms. This means that the initial cost of value-added products could be less than that of growing annual crops.

For more information about wild leeks and other native edible plants, contact Dr. Nadia Navarrete-Tindall at (573) 681-5392 or Navarrete-TindallN@LincolnU.edu.

References

Bernatchez, A., Brussieres, J., and L. Lapointe. "Testing Fertilizer, Gypsum, Planting Season and Varieties of Wild Leek (*Allium tricoccum*) in Forest Farming System." *Agroforestry Systems* 87, no. 5 (2013): 977-991. <http://dx.doi.org/10.1007/s10457-013-9613-1>.

Davis, J. M., and J. Greenfield. "Cultivating Ramps: Wild Leeks of Appalachia." In *Trends in New Crops and New Uses*, edited by J. Janick and A. Whipkey, 449-452. Alexandria, VA: ASHS Press, 2002. <https://www.hort.purdue.edu/newcrop/ncnu02/v5-449.html>.

Yatskievych, G. *Flora of Missouri*. Jefferson City, MO: Missouri Department of Conservation, 1999.

For further reading

Davis-Hollander, L. "Ramps Action Alert: The Sustainable Stand." *Grit*. Last modified April 4, 2011. <http://www.grit.com/blogs/from-the-ethnobotanist.aspx>.

Davis-Hollander, L. "Ramps (Wild Leeks): When is Local Not Kosher?" *Grit*. Last modified April 1, 2011. <http://www.grit.com/food/ramps-wild-leeks.aspx>. ■

Golden L Creamery

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The Lavys make a Gouda-style cheese and a cheddar. The Gouda, a washed-curd cheese, comes in several flavors. It is a semisoft cheese, perfect for sandwiches. Flavors are added to enhance the natural sweetness of the cheese. The cheddar is made in a traditional style and takes almost all day to make. This cheese goes through a process of cheddaring or stacking, which is how it gets its name. All cheese is aged in a special environment. Temperature and humidity are closely controlled. Some of the cheese is washed throughout the aging process, creating a natural rind. Others are sealed in Cryovac® bags for aging. Because the cheese is made from raw, unpasteurized milk, it must be aged for a minimum of 60 days.

Through innovation and hard work, the Golden L Creamery persists and thrives. Look for its products in St. Louis and Columbia area stores that sell cheese. Or, visit the website: www.lavydairyfarm.com. ■



Allium tricoccum (broad leaves) and *A. burdickii* (narrow leaves) growing in a raised bed under a canopy of oaks at Lincoln University in Jefferson City, Missouri.

Asian Pear Might Add to Your Farm's Crop Diversity and Increase Income

By Jim Pierce, Farm Outreach Worker

Farmers' markets are on the rise in numbers and popularity. More Americans are looking for fresh vegetables and fruits grown locally. Customers are asking for new and unique tastes. This expanding market demand is creating opportunities to explore growing exotic vegetable and fruit crops locally on small farms.

The Asian pear is a tree fruit crop that will compliment and diversify your current farm production and income. Your customers might find it both unusual and tasty. This pear is gaining popularity among American consumers. It is a good fit for farms with small acreage. And, it has the potential to improve income for farm families.



The Asian pear is sweet, juicy, crisp and crunchy. It is best to eat when fresh and ripe from the tree. Several varieties have thin delicious skin and are eaten like an apple, while some varieties have a leathery skin that you should peel. Fruits begin ripening in September, and varieties can be selected to provide fruits through frost. Trees begin to bear fruit in the third year; by year seven, they are in full production. The production of a three-year-old tree will be somewhere around 50 pears, increasing to around 300 per tree in year seven. A typical fruit can weigh up to a pound depending on the variety. By year seven, yields will range from 4,000-5,000 pounds per acre. Prices from the last several years have ranged from \$1.00 per pound to \$2.00 per pound at farmers' markets. In taste tests at area markets, the fruit have been well-received by consumers.

When planning to start your orchard, keep in mind the rootstock you have chosen. Typically, this is a standard or semi-dwarfing rootstock, which is preferred for controlling tree size and offering some disease tolerance. When selecting your rootstock, make sure it is winter-hardy. This is vital because some nurseries in California produce trees on rootstock that is not winter-hardy. Tree planting densities can be anywhere from 100 to 400 per acre. Several factors to consider are the space you have and the equipment you plan to use when spraying, pruning and harvesting. Generally, standard

rootstock should be planted 15 feet apart, with rows near 20 feet apart. The semi-dwarf can be spaced as little as 7.5 feet apart, with rows 15 feet apart. The closer spacing requires careful management of the tree size by pruning. The Asian pear is self-fertilizing; however, yields will increase when two or more varieties are planted in the same orchard.

The trees can be trained several ways. This flexibility allows you to choose how best to fit them into your growing space. The traditional peach tree shape is that of an open vase. When training for this style, head (cut off) the nursery stock at planting. The next step would be to select five or six limbs spaced around the trunk for scaffold branches. Weights, tie downs or spacers will be used to set the limbs in the open vase shape. A second style is the central leader. For this style, envision a Christmas tree shape. The central leader is allowed to grow to the desired height. Then, weights, tie downs or spacers would be used to set 60-degree crotch angles (angles formed by the tree trunk and main branches or scaffold limbs). Lastly, these trees can be trained to trellis as a V-shape. This style requires extra cost for the trellis. Head the nursery stock at planting, and then train two scaffold limbs in the shape of a V.

Another key aspect of the Asian pear is its fruiting spurs. Spurs are short, stocky shoots that form on

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Asian pear.

branches. These will produce flowers and leaves, so it is important not to remove them.

There are three main insect pests that infect Asian pears: the codling moth, spotted wing drosophila and pear psylla. The trees are susceptible to fire blight, a bacterial disease, but it can be easily overcome. Organic controls as well as removing and destroying the infected parts have been shown to be effective.

Here are some facts about the Asian pear:

- Are winter-hardy to around -20°F
- Require soil pH from 5.9-6.5
- Best planted in a well-drained location with full sun; avoid frost pockets
- Begin producing fruit in three years, with a fruiting spur life of 10 years
- Require annual pruning
- Use soil test recommendations for fertilizing
- Plant two varieties for better yields and cross pollination, although the pear is partially self-fruitful (self-fertilizing)
- Currently grown varieties in the Kansas City area: (1) 20th Century (round, yellow, thin-skinned, sweet and juicy) and (2) Olympic (large, round, green/bronze, thick-skinned, with milder flavor and russeted [brown with a texture] fruit)

For more information, contact your ISFOP FOW and/or visit the following websites:

1. UC Davis Fruit and Nut Research and Information: http://fruitsandnuts.ucdavis.edu/dsadditions/_Asian_Pears/
2. Midwest Tree Fruit Spray Guide (free download): <http://extension.missouri.edu/p/MP651>

Asian pear tree sources: Cummins Nursery: <http://www.cumminsnursery.com/>
Stark Brothers: <http://www.starkbros.com/> ■

Dealing with Powdery Mildew Disease in the Summer

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

Many people believe that mildew is just one disease. It is not. Mildews are generally of two types: powdery and downy. Though they are both mildews, each one is distinct. First, the organisms that cause these two groups of diseases are different. Powdery mildews are caused by true fungi. Downy mildews are caused by oomycetes, fungus-like organisms, commonly known as water molds. More importantly, the environments that favor these two groups of mildews also differ. Unlike many other fungal pathogens (agents that cause disease), powdery mildews do not require leaf wetness for infection. They only require high relative humidity along with a moderate temperature (60° to 77°F). Although common in cool and warm humid areas, powdery mildews are even more severe in warm, dry climates. They mostly prevail under warm conditions in greenhouses. In open fields, they occur during the summer and early fall. In sharp contrast, downy mildews are severe when a film of water is present on plant surfaces. They are most prevalent during cool or warm, but not hot, periods.

The symptoms of powdery mildews are probably the most common, making them easy to recognize. They appear as a white or grayish, powdery fungal growth on leaves, shoots, stems, buds, flowers and young fruits. Most spots are circular and not limited by the leaf veins. Yellowing

will be seen after the fungus has infected the plant for some time. On the other hand, downy mildew spots tend to be angular and limited by leaf veins. Water molds causing downy mildews can grow systemically (affecting the entire plant) inside the leaf. They produce spores mostly on the lower side of the leaf. In contrast, powdery mildews grow superficially. They extract their food from the surface through a siphoning organ called a haustorium. These haustorium are necrotrophic fungi, meaning that they kill their host and then eat it. Organisms causing mildews can spread using spores or conidia (seed-like structures) via wind, splashing rain or equipment. Mildew can also be transmitted by touching healthy plants after handling infected ones.

Here are some details about powdery mildews, their biology and management:

Powdery mildews are very common. You see them everywhere—on crop plants and ornamentals—chiefly during the summer. Although they seldom kill their host (the valuable crop), they cause many problems. They readily extract nutrients from the host, reduce photosynthesis (the process by which plants turn sunlight into usable energy), impair growth and eventually cause yield losses. Powdery mildews are capable of forming two types of spores (fungal fruiting structures): (1) active feeding spores (conidia) and

(2) sexual structures to overwinter (cleistothecium). The fungi that cause powdery mildews are mostly host-specific. This means they might not affect other crops. For example, *Sphaerotheca pannosa* f. sp. *rosae* only affects roses. On the other hand, powdery mildew of tomato can be caused by three genera (plural of “genus”), but the most prevalent in Missouri is *Oidium neolyopersicum*. This fungi is easily recognized by the formation of a whitish, talcum-like fungal growth on the upper leaf surface. Such information is critical when selecting the proper type of fungicide or organic amendment for a given area.

Integrated Disease Management (IDM) approaches to powdery mildew diseases include the following:

1. Grow varieties that are tolerant or resistant. This is the first and foremost weapon against powdery mildew. If the disease is a great concern at your farm or garden, ask your seed provider for powdery mildew-resistant seeds. This information may also be found in seed catalogs. Or consult your local Extension agent. If you see the letters “PM” (for powdery mildew) listed, then that seed lot is believed to be resistant to powdery mildew disease.

2. Proper diagnosis and early detection. Practice regular monitoring so you will recognize the symptoms at the earliest stage. Powdery mildew fungus is
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Powdery Mildew Disease (continued from page 6)

everywhere. It spreads quickly once it starts, so treating the disease in its earliest stage provides the best control.

3. *Reduce relative humidity.*

Improve air ventilation through timely pruning. Avoid over-irrigation, especially from overhead sprinklers. As stated earlier, the powdery mildew fungus does not necessarily need standing water or leaf wetness to infect. Most of the body of the powdery mildew fungus remains outside the host cell. Hence, the severity of this disease drops after a heavy rain in open field production.

4. Sanitation. Remove and destroy infected leaves or other plant parts. Eliminate all weeds that might harbor the disease and serve as alternate hosts.

5. Apply protective and curative fungicides or organically approved products. Wettable sulfur is used mostly in open fields. In protected systems, such as greenhouses and high tunnels, it is best not to use it because of its acrid and offensive smell. Constantly agitate it when spraying to avoid burning. Recently, the use of potassium silicate or Sil-MATRIX™ (approved by the Organic Materials Review Institute (OMRI)) works well in preventing powdery mildew on tomatoes. For reduced risk pesticide users, there is a range of fungicide chemistries for the various powdery mildews. In all cases, however, one has to read the labels very carefully. Also, make sure that they are approved for use in your state. The “Midwest Vegetable Production Guide for Commercial Growers 2015” is a very good resource to consult about fungicides suitable for each crop. This guide

can also be accessed online free of charge at <https://www.btny.purdue.edu/Pubs/ID/ID-56/>.

6. Integrated Powdery Mildew Management. Use one or more of the methods described above in a way that suits your gardening or production system.

Powdery mildews are parasites that infest the plant cells from the epidermis (outermost layer). Thus, any fungicide must be applied with full coverage of the affected areas.

For additional information, please contact your local Extension office or Dr. Zelalem Mersha, State Extension Specialist – Plant Pathology: (573) 681-5634 or MershaZ@LincolnU.edu. ■



Powdery mildew on cucurbits (such as melons and squash), with a typical powder-like symptom on squash (left) and watermelon (right).

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.

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ISFOP Regional Map

