



The Berry Basket

Newsletter for Missouri Small Fruit and Vegetable Growers

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Contents:

The Time is Ripe for Organic Blueberries	1
Coming Events	3
Strawberry Varieties for Missouri	4
Missouri's Invasive Plants	5
Stressed Out Plants	7
Missouri Farmers' Market Association	9
Make a Splash with Native Plants	11
Al's Backyard	12
SMSU Centennial Garden Dedication	14

From the Editors

by Marilyn Odneal

The dog days of summer are upon us, so what better time to think of cool events such as the Irrigation Workshop on August 9 and the Fall Horticulture Seminars on September 10, both at the State Fruit Experiment Station. And if you don't have a cool stream or pond to enjoy, just build one. "Make a Splash with Native Plants" and "Al's Backyard" may inspire you!

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The Time is "Ripe" for Organic Blueberries

By Ben Fuqua

Professor, Soil Science, SMSU

Each year, more and more consumers are seeking fruits and vegetables grown in "non-chemical" environments. People with allergies or intolerances to specific chemicals as well as those who simply prefer the taste of "organically grown" foods have created an exciting market for growers willing to meet organic production standards.

Of all the fruit crops, blueberries appear to be the best one suited for organic production as many of the cultural practices currently used already meet the organic growing requirements. Organic growers must adhere to the NOP (USDA National Organic Program) standards and certification is necessary to market blueberries as "organically grown". (Growers selling less than \$5,000 can opt out of certification requirements, but still must comply with NOP rules.) While the Missouri Department of Agriculture has suspended their "certification" process for organic producers, Missouri growers can still be certified through private agencies. Organic production of blueberries requires a definite commitment from growers and is certainly not for everyone. However, growers who produce organically grown blueberries will find a rapidly expanding market for their berries. While most cultural practices for growing organic blueberries are the same as those used in conventional production, some practices, particularly fertilization, weed control, disease control, and insect control, must be slightly modified to conform to the organic regulations.

Fertilization: A number of organic fertilizers are available to supply the nutritional needs of blueberry plants. Feather meal, blood meal, cottonseed meal, soybean meal, and fish meal are all good sources of nitrogen (N), while steamed-bone meal and seaweed are good organic sources of phosphorus (P) and potassium (K), respectively. Mined materials, such as potassium chloride and rock phosphate and some synthetic products, including sulfur (S), magnesium sulfate (Mg & S), soluble boron (B) and most micronutrient sources (except those containing nitrates and chlorides) are also permitted in the organic production standards. Animal manures, good organic fertilizers for most crops, are not recommended for blueberries because of their alkaline (basic) content. Heavy applications of manure tend to raise the soil pH above 7.0, a pH too high for maximum growth and production of blueberries.

The two major changes in fertilizing blueberries with organic sources involve the amount and timing of fertilizer applications. Organic fertilizers must be broken down (mineralized) to make the nutrients available for absorption by plant roots. The mineralization process takes time (2 to 6 weeks) and depends heavily on microbial activity in the root zone. It should be noted, however, that only a portion of the organic fertilizer is actually mineralized during the year of application, so there will be a gradual buildup of nutrients in the soil. For example, organic nitrogen sources release only about 50% of the N during the year applied and releases the remaining N over the next few years. Thus, a higher application rate must be used during the first year to provide adequate amounts of N to plants, but the rate may be reduced in subsequent years.

Most organic fertilizers have a lower nutrient content than chemical fertilizers. This means that a larger quantity of organic fertilizers must be applied to supply the same amount of the plant nutrients. Nitrogen is the nutrient needed in largest quantities by blueberries with rates of 60 to 100 pounds of N/acre being commonly recommended in Missouri. Thus, a grower wanting to supply 90 pounds of N using feather meal (13% N), would need to apply 1400 #/A (based on the 50% mineralization rate).

For cottonseed or soybean meal (7% N), the application rate would be 2600 #/A to provide the 90 pounds of N. After the first year, application rates could be gradually reduced due to the slow breakdown of the organic fertilizers. It is recommended that soil and foliar analysis be regularly (every 1-2 years) taken to monitor nutrient levels in the plants. Adjustments in fertilizer rates may be needed to insure that blueberry plants absorb adequate, but not excessive, amounts of nutrients.

The methods of applying organic fertilizers to blueberries are essentially the same as for chemical fertilizers. Most organic fertilizers are solids, and are generally applied by uniformly broadcasting the materials under the plant canopy. A few (e.g. fish emulsions) organic sources can be applied as foliar sprays or via fertigation (applying fertilizers through irrigation systems). Fertigation is not feasible for most of the organic fertilizers because of their low-water solubilities.

Weed Control: Controlling weeds is probably the greatest challenge for organic blueberry growers. Good site selection and eradication of perennial weeds, such as Johnsongrass and bermuda grass, prior to planting is essential. In an established planting, weed pressure can be reduced by maintaining a 6-7 inch (depth) layer of mulch (sawdust, wood shavings, pulverized bark, straw, etc.) within the plant row. Shallow cultivation with mechanical cultivators, mowing, hand hoeing, or simply pulling of weeds can also be used. A few growers have reported good results in controlling weeds by “weeder” geese (although the geese like to eat ripe berries) and portable flame torches. Weed eradication by flame is somewhat risky, especially in plantings mulched with sawdust or other flammable materials. Layers of plastic can be used to suppress weed growth, but have to be removed at the end of the growing season to meet NOP standards. Approved weed barriers (weed cloths) do a better overall job of controlling weeds than plastics, but are also more expensive.

Disease Control: Good site selection, proper soil preparation, healthy plants from certified nurseries,

and good sanitation practices are the keys to controlling diseases in blueberries. Good soil drainage is essential in preventing many soil-borne diseases that attack blueberry roots. Low-lying sites or other poorly drained areas should be avoided when selecting a site for a blueberry planting. Drainage problems in marginal sites can often be improved by setting plants on raised beds/berms and by incorporating large amounts of organic matter (compost, crop residues, peat moss, etc.) around the plant roots. Purchasing healthy plants from reputable nurseries will also greatly reduce disease problems in young plants.

Annual pruning of plants and rouging of diseased or unhealthy plants are recommended culture practices that help reduce disease problems. All pruning equipment, i.e. shears, loppers, saws, etc. should be frequently disinfected by dipping into a 20% bleach solution. Removal of the pruned clippings from the field will also help reduce the spread of disease inoculums. Some synthetic compounds, such as copper sulfate, copper hydroxide, hydrated lime, hydrogen peroxide, elemental sulfur, lime-sulfur, and selected horticultural oils (dormant, suffocating, and summer oils) can also be used by organic growers to combat plant diseases.

Insect Control: Until the last 2-3 years, insects had not been a major problem for Missouri blueberry growers. Only a few growers had reported any insect damage to the berries and rarely were control measures warranted. Recently many blueberry plantings have been severely damaged by the Japanese beetle. The beetle emerges in late June to early July, during the peak berry production season, and damages both plant leaves and ripe fruit. Japanese beetles are difficult to control under the best of conditions and a “beetle” plan should always be in place. Several approved mechanical and biological control measures are available for organic growers to control these pests. The use of milky spore disease is probably the best long-term approach to reduce the beetle larvae (grub) population. Elemental sulfur, lime-sulfur, insecticidal soaps, horticulture oils, and sticky traps are also approved for organic

production. Pheromones can be used as an insect attractant.

Summary: The demand for organic produce continues to grow by leaps and bounds. Consumers will travel several miles and pay premium prices for quality organically grown blueberries. Organically grown blueberries typically bring 25 to 50% more than conventionally grown blueberries. To growers willing to put forth the effort and expense to meet the NOP standards for growing organic blueberries, “the time is right and the market is ripe”.

For additional information about Missouri’s organic grower certification process, cost-share funds for certification, organic marketing workshops, organic producer’s directory, etc. contact Allen Benjamin (Allan.Benjamin@mda.mo.gov) at the Missouri Department of Agriculture.

Coming Events

Irrigation Workshop

SMSU State Fruit Experiment Station,
9740 Red Spring Road
Mountain Grove, MO 65711
Tuesday, August 9, 2005
9:30 am to 2:00 pm.

Fall Horticulture Seminars

SMSU State Fruit Experiment Station
9740 Red Spring Road
Mountain Grove, MO 65711
Saturday, September 10, 2005
9:00 am – 12:30 pm

For more information on the workshop or seminars, contact:

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or check the web at

<http://mtngrv.smsu.edu/calendar.htm>

Strawberry Varieties for Missouri

By Martin Kaps

Research Pomologist, SMSU

Evaluating strawberry varieties for adaptability to Missouri weather conditions has been an ongoing research project at the SMSU State Fruit Experiment Station. A matted-row planting was established in spring 2004 and began fruiting in mid-May of 2005. Fifteen June-bearing or short day varieties were planted. The name June-bearing implies when these strawberries start fruiting in northern U.S. states. Missouri is in the midwestern to central U.S. and borderline between northern and southern growing regions, so these strawberries start fruiting in May. Short day strawberry is the more accurate description for these varieties. Plants initiate flowers during the shorter and cooler days of fall for flowering the next spring.

Of the fifteen strawberry varieties, six were released from Nova Scotia, Canada (Annapolis, Brunswick, Cabot, Evangeline, Mira, Sable); one from Great Britain (Eros); one from France (Darselect); one from Italy (Idea); two from Maryland USDA (Allstar, Ovation); two from New York (Clancy, L'Amour); one from North Carolina (Bish); and one from Minnesota (Mesabi). Bearing seasons included early (Annapolis, Evangeline, Sable); early-mid (Bish, Brunswick, Darselect, L'Amour, Mira); mid (Allstar, Mesabi); late-mid (Cabot, Clancy, Eros, Ovation); and late (Idea). In reality early-mid, mid, and late-mid varieties tend to blend into each other during the fruiting season. Following are brief descriptions of the varieties.

Yield, fruit size and firmness, color, and flavor are based on measurements taken in 2005. Plant vigor, winter hardiness, disease resistance, and adaptation to U.S. regions are taken from nursery industry descriptions.

Allstar has high yields of large size, firm fruit. Berry color is medium red. Flavor is good, slightly tart. The plant is vigorous and resistant to red stele. It is adapted to midwestern and southern growing regions.

Annapolis has high yields of medium size, firm fruit. Berry color is medium red. Flavor is very good, slightly tart. The plant is vigorous and winter hardy. It is resistant to red stele. It is adapted to northern and midwestern growing regions.

Bish has moderate yields of medium size, firm fruit. Berry color is dark red. Flavor is very good to excellent, sweet. The plant is vigorous. It is resistant to red stele. It is adapted to midwestern and southern growing regions.

Brunswick has high yields of large size, firm fruit. Berry color is dark red. Flavor is very good, sweet. The plant has good vigor and winter hardiness. It is resistant to red stele. It is adapted to northern and midwestern growing regions.

Cabot has high yields of very large size, firm fruit. Early fruit can be rough. Berry color is light to medium red. Flavor is good, slightly tart. The plant has moderate vigor with less runner production, but winter hardy. It is resistant to red stele. It is adapted to northern and midwestern growing regions.

Clancy has moderate yields of large size, firm fruit. Berry color is medium red. Flavor is very good, sweet. The plant is vigorous and winter hardy. It is resistant to red stele. It is adapted to northern and midwestern growing regions.

Darselect has high yields of medium size, firm fruit. Berry color is medium to dark red. Flavor is excellent, sweet. The plant is vigorous and winter hardy. It is adapted to northern, midwestern, and southern growing regions.

Eros has high yields of medium size, firm fruit. Berry color is dark red. Flavor is very good, sweet. The plant is vigorous and moderately winter hardy. It is resistant to red stele. It is adapted to midwestern and southern growing regions.

Evangeline has moderate yields of medium size, intermediate firm fruit. Berry color is dark red. Flavor is very good to excellent, sweet. The plant



Dr. Martin Kaps (left), research pomologist, and Patrick Byers (right), Fruit Grower Advisor, collect strawberry data from the cultivar evaluation planting.

is vigorous and winter hardy. It is resistant to red stele. It is adapted to northern growing regions.

Idea has moderate yields of large size, firm fruit. Berry color is light red. Flavor is good, slightly tart. The plant is vigorous and winter hardy. It is red stele resistant. It is adapted to northern and midwestern growing regions.

L'Amour has moderate yields of medium size, firm fruit. Berry color is light red. Flavor is good to very good, slightly tart. The plant is vigorous and winter hardy. It is red stele resistant. It is adapted to northern through midwestern growing regions.

Mesabi has high yields of medium size, intermediate firm fruit. Berry color is dark red. Flavor is very good, sweet. The plant is vigorous and very winter hardy. It is red stele resistant. It is adapted to northern growing regions.

Mira has high yields of medium size, intermediate firm fruit. Berry color is medium red. Flavor is very good, sweet. The plant is vigorous and winter hardy. It is red stele resistant. It is adapted to northern and midwestern growing regions.

Ovation has low to moderate yields of large, firm fruit. Berry color is medium red. Flavor is very good to excellent, sweet. The plant is vigorous and moderately winter hardy. It is red stele resistant. It is adapted to midwestern and southern growing regions.

Sable has moderate yields of small to medium size fruit. Berry color is dark red. Flavor is very good, sweet. The plant is vigorous and winter hardy. It is adapted to northern and midwestern growing regions.

These strawberry varieties will be renovated after harvest in 2005 and cropped again in spring 2006. A final report on their productivity will be published following that harvest.

Missouri's Invasive Plants

*By Jennifer Barnes-Schutter
Regional Horticulture Specialist, MU*

“Exotic,” or “non-native” species refers to plants, animals, fungi or other organisms that have been introduced to an area outside of their origin either intentionally or accidentally. Exotic species can come from another continent, another part of a country or even from another watershed. Seeds from exotic plants come in on clothing, luggage, freight, etc.

According to *The Flora of Missouri*, the reference for all plants in the state, Missouri includes 2,770 plant species. Twenty-eight percent (or 765 species) are introduced or exotic. Fortunately, only about 4 percent of these are considered invasive.

Invasive exotic plants share a number of traits. They exhibit rapid growth and maturity and produce large amounts of seed. Invasive exotic plants are adapted to a broad range of soils and have the ability to out-compete native species. The seed is widely dispersed by birds, mammals, wind or water and remains dormant and viable for many years. Many invasive exotic plants secrete chemicals or natural herbicides inhibit the germination or growth of native species. However, the most important advantage that invasive exotic plants have over native species is they lack the natural controls that native species are subject to. Few insects and diseases affect them.

Many non-native plants that were brought to North America do not spread aggressively. Tulips, for example, are originally from Asia. They stay where they are planted and do not spread. They may require special watering, fertilizing, or protection from the heat or cold to keep them vigorous.

In our native grasslands, forests and wetlands, many plants and animals co-exist, each with their own role or function in the larger ecosystem. Invasive exotic plants disrupt this balance. They are recent intruders in landscapes that evolved over thousands of years. Once purposely or inadvertently introduced to wild lands or roadsides, they often spread into natural areas. Once established, they signal the beginning of a downward spiral of decreasing species richness and increased uniformity of habitats.

Some exotic plants are used to control erosion or provide food for wildlife, but over time people have failed to consider the undesirable effects of these exotic plants. Shrub honeysuckle, for example, provides fruit eaten by birds, but recent studies have indicated that nesting birds in the honeysuckle lose more eggs or young to predators than birds nesting in native shrubs.

Sericea lespedeza is an invasive, non-native plant that is cropping up on Missouri roadsides, in pastures, along waterways, and even in the shade of forest edges. Because of its hardiness and ability to spread, this perennial legume threatens to displace native plants. Planting sericea lespedeza was once promoted as an erosion control measure. The plant was also considered acceptable forage for both cattle and wildlife. We now know that sericea lespedeza is, in fact, aggressive and potentially harmful. Sericea lespedeza (*Lespedeza cuneata*) is native to eastern Asia. It first showed up in America in the 1800s. Often called “poor man’s alfalfa,” it was initially used on a large scale in the U.S. as a pasture crop. It first appeared in Missouri in the 1930s, when it was planted as forage for livestock and to control erosion on roadsides and strip-mined land. It was also thought to provide wildlife food and cover. Recent studies have shown that native grasses work much better for erosion control. Although it is high in crude protein, sericea is a poor

nutritional source for animals. Wildlife, such as quail, will eat sericea seeds, but the energy contained in the seeds will not sustain them through extreme weather conditions. Quail and other ground nesting birds may not even be able to fully digest sericea seeds because of their hard outer layer.

Cut-leaved and Common Teasel was brought to North America from Europe as early as the 1700’s. The seed heads were once used to raise the nap of cloth in the textile industry. It has spread rapidly from the eastern United States in the last few decades, primarily along highway rights-of-way. Teasel grows in large, dense stands from which it excludes other vegetation.

Autumn Olive is native to China, Korea, and Japan and was widely planted in the past for food and wildlife cover, to create windbreaks, and for erosion control. It is found in old fields and pastures, along roadsides, and in open forests. Birds spread the seeds after eating the fruit, making this shrub/small tree an invasive species.

Purple Loosestrife is a perennial brought from Europe and Asia in the 1800’s for use as an ornamental and as a nectar source for honeybees. It can be found in or near freshwater marshes, wet prairies, and other wetland habitats eliminating native wetland flora. There are cultivated species that are legal to use in the landscape.

Kudzu was introduced into the United States from Japan in the late 1800’s. It was originally used for erosion control and livestock forage. It spreads over the ground or climbs on shrubs and trees forming a dense tangle of vines that shades out any vegetation beneath it.

Multi-flora rose was brought to the U.S. from Japan to be used as a rootstock on which to graft cultivated roses. It was later used for erosion control, wildlife food, and a living fence for livestock. It is mainly found in pastures and fencerows. It can form impenetrable thickets that smother other vegetation.

Musk Thistle is native to Europe. It grows primarily in pastures and fields, on waste ground,

and along highways and railroad rights-of-ways. It can invade glades and prairies. Musk Thistle competes with crops for light, space, nutrients, and water.

The Missouri Department of Conservation has identified these exotic plants as aggressive and invasive to our native ecosystems. They are working to eradicate or control the plants on public lands that they manage. You, too, can take steps in eradicating and stopping the spread of these invasive species on your property.

SOURCE: Missouri Department of Conservation and Department of Natural Resources

Stressed Out Plants

By Wenping Qiu

Plant Molecular Biologist, SMSU

Dr. James P. Baker, vice President for Research and Development of the Southwest Missouri State University, and I visited the Ningxia Forest Institute, China from April 13 to 16, 2005. The Ningxia Forest Institute is located in Yingchuan, the capital city of the Ningxia Hui Autonomous Region. The Institute also hosts the National Center of Economic Forest Seedling Speedy Propagation Engineering and Technology Research (referred to as the National Center hereafter). The purpose of this trip was to confer with our partners to discuss and produce a working plan for the implementation of the Grapevine Biotechnology Agreement signed by the National Center, the China Agricultural University (CAU), and the Southwest Missouri State University. The National Center plans to develop and establish the grape transformation technology as one of its long-term research projects. During this trip, we also had a chance to walk through the Botanical Garden of plant species adapted to dry and salty soils.

Ningxia is in the northwest region of China (Figure 1). It has a temperate climate with four distinct seasons. The Yellow River runs across the region from North to South and is a major source of irrigation water for the Yinchuan plain. The average annual temperature is 5-10°C (40 - 50°F);



Figure 1. Ningxia Hui Autonomous Region is located in the northwest area of China. The Yellow River runs north and south across the region

average rainfall is approximately 300mm (12 inches). It has 3,000 hours annual sunlight and 170 non-frost days. Soil is semi-dry to dry because of low rainfall and high water evaporation. Salt levels are high and soil is alkaline. Native vegetation range from forest and prairie to dry prairie and desert.

Due to unique local climate and soil conditions, only crops and plants adapted to drought, high salinity and high alkalinity can be grown in Ningxia. During 1990s, the National Center initiated a program of introducing and evaluating plant species from other regions and other countries. Some of these species are introduced as ornamental plants for home garden and commercial landscape. Other species have been used as alternative herbs in traditional Chinese medicines.

In the late 1990s, grape-planting and wine-making began to emerge as a new industry in Ningxia. The region east of the Helan Mountains, Ningxia is designated as one of the National Grape and Wine Appellation Protection Regions. Table and wine grapes are becoming one of the primary economic crops in Ningxia. Major wine grapes are *Vitis vinifera*-derived cultivars such as Cabernet Sauvignon and Chardonnay. Major table grapes are Autumn Royal, Sentanny Seedless and Super Seedless (Figure 2). A major challenge for the Ningxia grape and wine industry is that vines must be buried overwinter to prevent freezing damage. Unlike freezing damage in Midwest regions of the United States that is caused by extreme low temperature or sudden temperature drop, freezing damage in Ningxia is caused by a combination of low temperature, low humidity and strong winds, leading to irreversible injury on trunks. Another

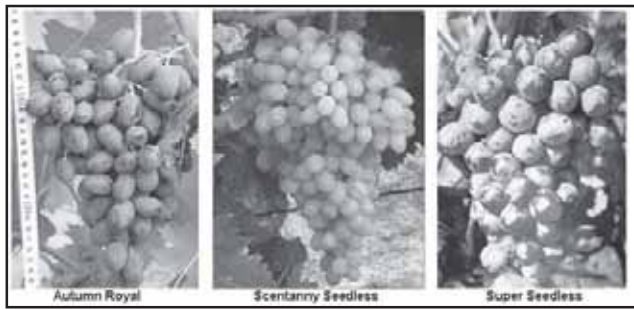


Figure 2. The top three table grapes that are grown in Ningxia are the blue Autumn Royal, the green Scintanny Seedless and the pink Super Seedless.

limiting factor is the high incidence of powdery mildew and downy mildew. Therefore, selecting disease resistant grape cultivars that are also capable of tolerating freezing damage is one of the priority research projects in the National Center.

In addition to grapes, Ningxia also has native plant species, three in particular, that are worthy to be introduced.

Wolfberry (*Lycium barbarum* L.) (Figure 3): Wolfberry is claimed to be a ruby gem of Ningxia. Economically it is the most important small fruit crop in the region. Wolfberry fruits are made into raisins, candy, herbal medicine, and are also used to adjust the flavor of liquor.

This fruit contains the Lycium Barbarum Polysaccharide (LBP), the main nutraceutical component, and 19 types of amino acids and 21 trace minerals. It has more beta-carotene than carrots and nearly as much Vitamin C as oranges. It is also enriched with antioxidants. Chinese people have used wolfberry fruits as natural medicine and food for thousands of years. The quality of wolfberry fruits produced in Ningxia is the best because of the large difference between day and night temperature and the low humidity, as well as the arid, alkaline, salty soil. Wolfberry can tolerate temperatures from -27°C to -39°C (-27°F to -38°F). It blooms between April and October and harvest is from June to October.

Sea buckthorn (*Hippophae rhamnoides* Limn) (Figure 4): This plant is highly adaptive to extreme abiotic stresses. It tolerates drought, high salinity

and alkalinity, and extreme temperature as low as -43°C (-45°F). Its roots are heavily populated with rhizobia. It is a superior shrub that is grown as a protection plant for fixing sand and reducing soil erosion. It bears yellow to orange berries. Fruits are rich in amino acids and vitamins. Vitamin C content is higher even than strawberry and kiwi. The seed oil of sea buckthorn contains medicinal chemicals that are anti-inflammatory, relieve pain and promote tissue regeneration, and is used to treat epidermal damages such as burns, scalds, and ulcers. People also drink tea made from buckthorn leaves and make the fruit into jam.



Figure 3. Red-orange wolfberries.



Figure 4. The yellow-green berries of sea buckthorn.



Figure 5. *Alternate-leaved butterfly bush with purple flowers.*

Alternate-leaved butterfly bush (*Buddleja alternifolia* Maxim) (Figure 5): This native species is mainly used as an ornamental and as a protection forest plant to prevent wind damage as well as for sand-fixation. It is highly tolerant to drought and sandy conditions. Legend tells us that its leaves are rich in secondary metabolites such as alkaloid compounds; fish can become intoxicated if leaves are dropped into fish tank. We could not verify if this tale to be true since no leaves had emerged when we visited the Botanical Garden.

Currently the National Center is introducing, selecting and evaluating more than 20 plant species that have hardy characteristics, and ornamental, medicinal, nutraceutical and economical value to the Botanical Garden. It will produce seedlings at industrial scale through the speedy propagation technology and provide thousands of plants to the commercial markets.

As a result of this trip, I learned that no matter how stressful conditions are, some plants are still able to thrive. This surely is a lesson for me.

Acknowledgement: I would like to express sincere appreciation to Jian Li, the Director of the National Center, for providing information and photos for this article. Dr. Baker and I also convey our gratefulness to Director Li and her colleagues for planning and arranging this trip.

Missouri Farmers' Market Association

By Peggy Schletty

President, MFMA

I was asked to write an article about the Missouri Farmers' Market Association, and I wondered what I would say about it. However, once I get going, it's not hard for me to promote our Association, the farmers, and markets that make up our membership. For starters, it's an association of farmers' markets in Missouri, but it is so much more. It represents the coming together of small, medium and backyard farmers that make up the backbone of one of our state's oldest industries. Farming!

Farmers have been coming together to sell their harvests since the beginning of Missouri towns, but the association is fairly new, started about 4 years ago by persons interested in forming an alliance of Missouri Farmers' Markets for the benefit of promoting, strengthening and gaining support for the markets in our State. With the guidance and support of AgriMissouri™, a group of market managers and interested growers came together one November day in Columbia to adopt a set of by-laws and put into motion this idea of bringing together the rapidly growing number of small and large farmers' markets in Missouri.

The idea of a state farmers' market association was not new; in fact, many, many states already had some form of this plan already operating. In many states it's totally run by a government agency, and in others it's totally autonomous. Our Association is separate from the state government, but very much encouraged and supported by our Department of Agriculture. We are more like a partnership than anything else.

One division of AgriMissouri™ is Agritourism and that is the division farmers' markets fall under. Farmers' Markets are promoted not only for fresh grown fruits and vegetables, but also as a destination for experiencing Missouri products, just like our state wineries. In fact, many markets are like "happenings", with musicians; chef demonstrations; children's events; corn roasts;

tomato, fruit and melon fests; community fund raising activities; with some markets serving breakfast, lunch or dinners. Most markets will probably have one or more of these activities at least once during the season, with many promoting something special weekly or monthly. Farmers' Markets aren't just for buying fresh vegetables anymore! They can be a fun destination for the whole family, and are promoted as such.

Each farmers' market is unique, with different rules, different objectives, a different organizational makeup, and different products. So much goes into dictating how a market "looks", that there is no way you could ever say they are alike. Whether they are in a big city or rural town, there is one thing that does make them alike! And that is the promotion of the farmers, the growers and the producers of the commodities that are for sale at the market itself. Just by coming together as an organized market, the producer is being promoted as having a fresh homegrown or produced food item. That is exactly what the MFMA does also. By Missouri Farmers' Markets coming together, we promote those growers and producers of Missouri grown and made products.

One of our main objectives is to educate market managers, directors and promoters in how to manage a market to make it more profitable for everyone, and to do it easier and smarter. To this end, we offer to these folks at least once a year, the opportunity to gain knowledge from someone who is more experienced in this field, as they share their wisdom and experiences at a workshop. It is our hope to educate through those who have gone before us. It is not our job to invent the wheel, but to keep that wheel turning better in our State and to assist the growing number of small entrepreneurs in established and new markets

Each year more and more people are trying their hand at either making a living or supplementing their income with farming of some sort. In addition, each year more and more folks are attempting to turn those products produced on farms into "value added" goods. In conjunction with SMSU, the University of Missouri, AgriMissouri™, and State extension offices, training is also offered to the growers and

producers to enable them to work smarter, safer, and become more productive, thus more successful.

It is also our desire to educate the public on buying; eating; and using fresh Missouri produced fruits, vegetables, and products. In my opinion, we have one to two generations now that do not even know how to buy or use fresh produce. They have become so accustomed to getting their food from cans, frozen food packaging or fast food outlets, that they just don't recognize what fresh food tastes like. For those of us who do know the difference in taste, it's a no brainer. It's a shame so many folks don't realize or appreciate what our local farmers do for us. We may not have the time in our own schedules to grow fresh food for ourselves, but there are those who are willing to put in the time and effort to feed us with great tasting products. There are few vegetables or fruits grown out of state, or out of the USA that can be picked, shipped and sold a week or two later, and taste like nature intended it. So educating the public on the goodness, healthiness, let alone the safety of local food is an important part of the Association's goal.

If you know a farmer, grower, producer or a farmers' market, ask them if they are a member of the Missouri Farmers' Market Association. Our association is only as strong as those who believe in our goals and support us. Help keep Missouri farmers growing by shopping at your local farmers' market. As our motto says, "Missouri Farmers' Markets — Healthy, Fresh and Fun to Boot!" For more information, check out the website www.AgriMissouri.com/farmersmarket.htm

Make a Splash with Native Plants

By Judy Allmon

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Water gardens are as popular as ever. Adding a water feature not only provides a unique visual beauty but the sound of water can also create a feeling of relaxation. If you have the space, a permanent water feature can be created using one of the many liners on the market. There are also a variety of fountains and pump systems that can help you create any sound from a babbling brook to thundering Niagara (almost!). But did you know it's easy to create a small water garden, even if you have no yard?

Set up a temporary water feature, or Pond-In-A-Pot, for your deck or patio with any large container that will hold water. You don't need a recirculating pump for one of these cool gardens unless you want to add the sound of trickling water. As a general rule, if it holds water, is large enough to accommodate the plants that you've chosen and has a nonreactive surface, it's a container that works as a water garden.

Create your Pond-In-A-Pot by using the correct types of native water plants for your container. They all thrive in water but have different growing habits and water depth requirements.

Shoreline plants grow at the water's edge. Water in your Pond-In-A-Pot should just cover the planted base of the shoreline plant. That's because shoreline plants grow naturally in shallow water at the water's edge.

Emergent water plants grow best in shallow water (1 to 12 inches deep), between the shore and deeper water. These interesting water plants are among native plant enthusiasts' favorites. Examples include Pickerel Weed, Spatterdock, Spike Rushes, Wild Canna, Arrowhead and Soft Rush.

Floating native plants have many floating leaves and include Water Lily and Water Fern. These native plants can help reduce algae and mosquito larvae in the water garden because their leaves cover water surface. Both reproduce rapidly; you may need to cull some of the plants from time to time.

Submerged plants usually require more space and control. Some like Fanwort, Pondweeds, and Milfoils can become problematic, especially if used in an open pond. Bladderworts—Missouri's only carnivorous plants—need deeper water—at least one foot of water above their roots. However, because Bladderworts do not attach to soil, they are easier to control. To grow one of these fascinating plants well, you'll want an extra large container such as a bathtub or a whiskey barrel.

Location and Selection of Plants

Your Pond-In-A-Pot, will do best with morning sun or in a protected spot with partial sun. This mild environment protects water plants from the intense heat of afternoon sun that can burn and harm the plants.

Use a variety of heights and textures to create a visually pleasing composition for your Pond-In-A-Pot. Mix both horizontal and vertical growing plants as well as smooth and textured leaves for an interesting composition.

Remember less is more. A bit of empty water space keeps the arrangement from appearing overcrowded, and a simple arrangement offers a feeling of tranquility, the idea behind water gardening.

Directions for a Deep Pond-In-A-Pot

This Pond-In-A-Pot will require a sizeable container pot, approximately 24-36" in diameter and 18-24" in depth. Your pot will get heavy with water, so assemble the Pond-In-A-Pot, in a sturdy, permanent location.

1. Clean your pot by rinsing it out with water.
2. Select your feature plant, e.g. an emergent like Wild Canna, in its original container in the bottom center of the pot.
3. Fill pot 1/3 full with medium sized rocks.
4. Fill the pot half full with water.
5. Place a smaller emergent plant, such as Pickerel Plant or Soft Rush, still in its container, near the back of the container.
6. Place an inverted clay pot on top of rocks in the front of the pond pot. Now set a shoreline plant

such as Lizard's Tail or Tussock Sedge on top of the inverted pot (keep the plant in its original container). If your pot is large enough, repeat this step with a second or third shoreline plant.

7. Bring water level to the top of the container.
8. If you still have room, place a floating plant, like Water Fern, on the surface of the water.

Be sure to check the water level in your Pond-In-A-Pot daily, filling it when necessary. In the fall, when temperatures cool to 55 degrees F, either plant your native water plants in and around a permanent pond, bury the entire water and plant filled pot up to its rim, or bring your Pond-In-A-Pot to a sunny, indoor location for the winter.

Drain your Pond-In-A-Pot when decomposed matter accumulates on the bottom of the pot. Thoroughly clean the inside surfaces of the pot with a stiff brush and divide the plants if necessary.

Mosquitoes should not be a problem. If you are concerned, add one or two small fish to keep down mosquito larvae. One or two aquatic snails could be added to help keep the water clean. You can also purchase 'Mosquito Dunks' (available at garden centers). They are safe to use around children, pets and wildlife. One 'Dunk' is suggested for every 100 square foot of water, so you can halve or quarter it.

Recommended Native Pond-In-A-Pot Plants

Shoreline – Water Plantain - *Alisma triviale*, Tussock Sedge - *Carex stricta*, Horsetail – *Equisetum spp.*, Rose mallow – *Hibiscus lasiocarpus*, Southern Blue Flag - *Iris virginica var. shrevei*, Copper Iris - *Iris fulva*, Water Willow- *Justicia americana*, Lizard's Tail - *Saururus cernuus*

Emergent - Spike Rushes - *Eleocharis spp.*, Soft Rush– *Juncus effusus*, Splatterdock – *Nuphar luteum*, Pickerel Weed - *Pontederia cordata*, Arrowhead - *Sagittaria spp.*, Wild Canna - *Thalia dealbata*

Floating - Water Lily - *Nymphaea odorata*, Water Fern – *Azolla mexicana*

Submerged - Bladderworts - *Utricularia spp.*

Al's Backyard

By Marilyn Odneal, SMSU

Al Arnold, who works for SMSU Computer Services, was explaining the coding of hidden fields for a web page project that we were working on, and my mind was wandering. He had the most beautiful waterfall garden on his computer desktop which I stared at frequently for relief. I asked him if that was his backyard and was amazed when he said "yes". I was even more surprised when he said that he and his wife, Sharmane, constructed the water garden themselves. The conversation mercifully went from javascript to something I could understand and appreciate.



Al and Sharmane's garden showing the waterfall running down into the pond (photo by Al Arnold).

I showed photos of Al and Sharmanes' water garden to the Tri-County Master Gardeners, a group that does valuable volunteer work on the educational gardens at the Mountain Grove Campus. They all wanted to visit, so Al checked with Sharmane and we arranged a tour. We met at the garden, located in Mansfield, on Saturday, June 18.

The garden is located on the southeast slope next to the house that Al and Sharmane mostly constructed themselves. The house and garden overlook a large pond with Al's bench and fishing pole on the bank.

Al and Sharmane had the pond area excavated while they were building the house. After the house was up, they began work on the garden by hauling rock and moving earth. Some of the large plants were brought from their former home in Nebraska. Others were gathered and purchased along the way. They experiment with many different plants and transplant the ones that work to other parts of



Sharmane (right) discusses the plants with the group. Note the different textures of plants on the slope up to the house.

the garden. “I plan everything out on paper, but Al just goes out and plants.” Fish are not kept in the pond due to visits from raccoons and other critters. Speaking of critters, Sharmane recalled some close encounters with copperheads while working on the rocky slope. “They seem to like the sedum, so I am very careful when working around it.”

The garden has a wonderful variety of plant textures in addition to the rock work and water. Japanese iris, Achillea ‘The Pearl’, daylilies, lilies, sedum, California poppies, fountain grass, boxwood, groundcover strawberries, alpine strawberries, and vinca are just some of the plants. Several natives or cultivars of native species are also in the garden including butterfly weed, primrose, coneflower and liatris or blazing star. The colors were predominately oranges, purples and yellows when we visited with many greens, gray-greens and earth tones along with the bright red fruit of the strawberries.



Al painted the PVC pipe going to the filter to resemble copper tubing which matches the light fixtures on the house (photo by Al Arnold).

After looking at the garden and discussing the plants, we went into the house for tea, cookies and an excellent presentation of the construction of the waterfall and water garden. Al is invited to write about the construction process of the water garden and water fall in an upcoming issue of the Berry Basket.

I remember back in his office I expressed disbelief after hearing that the artistic scene on Al’s computer desktop was built by him and Sharmane in their own backyard. Al smiled and said “I know, you thought I was just a computer nerd!”



The tour group poses with their gracious hosts on the patio next to the pond.

Centennial Garden Dedication

By Marilyn Odneal, SMSU

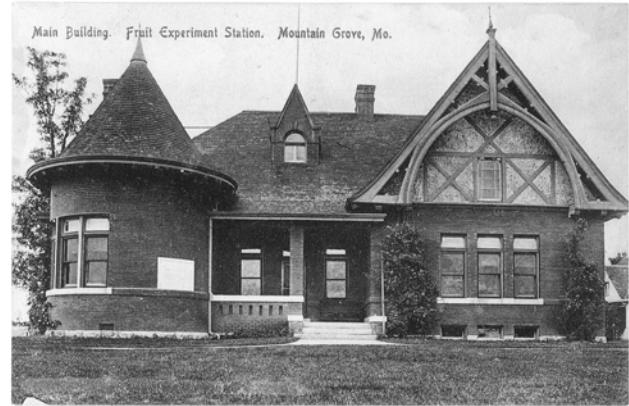
The Centennial Garden, prepared and planted in 2003 and 2004, was dedicated on June 17, 2005 as part of the Southwest Missouri State University Centennial Celebration. Dr. Inno Onwueme, Associate Dean of the School of Agricultural Sciences and Head of the Fruit Science Department, welcomed everyone and introduced those on the program. Dr. Jeanne Phelps and Dr. Earle Doman of the Centennial Steering Committee talked about the garden project and Patrick Byers, Fruit Grower Advisor, recounted the history of the



The dedication speakers from right to left: Jeanne Phelps, John Keiser, Inno Onwueme, Earle Doman (back), Mary Sheid, Patrick Byers and Marilyn Odneal.

State Fruit Experiment Station from its establishment in 1899. I spoke about the garden research and implementation and was followed by Mary Armstrong of the Mountain Grove Chamber of Commerce who commented on the role the Mountain Grove Campus has in the community. Dr. Keiser, president of SMSU, related the garden to the whole campus and then unveiled the dedication plaque with Mary Sheid, vice president of the Board of Governors, who read the dedication.

Earle Doman mentioned in his address that his grandmother, who was born in the 1890s, advised him not to set plants close to the foundation of his and his wives' first home so "it could breathe". He thought this was odd until he learned that doctors in



the mid-1800s advised against placing plants against the foundation of the house as it would promote diseases like tuberculosis, and this was probably why his grandmother so advised him. Only a few vines were allowed to be planted up against the house in those days as in the early photo of Faurot Hall above (Koziol 2004). Foundation



plantings, therefore, were relatively new during the post-Victorian era, and were recommended as a way to "settle" the house in its grounds.

Our approach to the Centennial Garden was to "make a new layer" (Adams, 2004), that is, we represented the original foundation planting with bridal wreath spirea and vines (see the 1923 photo of Faurot Hall directly above), but increased the number and diversity of the plants to enhance the educational value of the garden.



The crowd enjoys the beautiful weather on garden dedication day.

All of the plants used were popular in American gardens of the early 1900s (Favretti, 1978). Older cultivars as well as newer cultivars of old-fashioned plants are incorporated. Purple coneflower is used to signify the strong movement to use native plants in gardens in the period. New Dawn rose, climbing over the arbor, was the first plant to receive a patent in 1931.

The research conducted on American garden history involved examining early 1900s photographs of Faurot Hall from the Fruit Station archives housed in the Paul Evans Library of Fruit Science. Garden Magazines of the period were also used and proved to be the most valuable source of information on the period. "Magazines published between the turn of the century and World War II preserve an important heritage of American garden writing and provide a remarkable record of our largely forgotten past achievements as a nation of amateur gardeners. This flourishing era of garden



Dallas Dawson discussed the pruning of 'Bath's Pink' dianthus with interested listeners.

writing began just as broad-circulation magazines were becoming our first national medium of mass communication . . . and were the leading force in establishing a dominant popular culture extending through all social classes and geographical regions of the United States." (Clayton, 2000)



Mary Sheid reads the dedication while Inno Onwueme and President Keiser listen.

The weather cooperated and the dedication was followed by a mini-open house of the campus buildings and grounds. President Keiser commented in his address that "this entire campus is a garden. The Centennial Garden focuses on that."

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