



The Berry Basket

Newsletter for Missouri Small Fruit and Vegetable Growers

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From the Editors

by Marilyn Odneal

It is true that the Berry Basket is a newsletter for fruit and vegetable growers, however, we include a broad spectrum of articles including ornamentals. Our diverse, direct market growers raise many different crops and often serve as horticulture educators to their customers. We hope this spring issue offers plenty of food for thought.

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NOP and Blueberries

by Ben Fuqua

The passage of the USDA National Organic Program (NOP) in October 2002 and subsequent adoption of these standards by the Missouri Department of Agriculture's Organic Program creates an opportunity for blueberry growers to become "certified" organic producers. With an increasing demand for fruits and vegetables by consumers who prefer products produced in a non-chemical environment, the NOP provides Missouri growers another option for growing and marketing quality blueberries. To become "certified", growers must be knowledgeable of all rules/regulations and keep good records to document production activities.

Of all fruit crops, blueberries appear to be the one best suited for organic production as many of the cultural practices recommended for growing blueberries already meet the NOP standards. Growers with established blueberry plantings must follow (and document!) organic production methods for 3 years before being eligible for certification. Growers with new plantings or plantings already following organic practices can apply for certification at any time. While NOP crop production standards allow several synthetic substances to be used in certified organic systems, it also prohibits the use of some other nonsynthetic substances.

Organic production of blueberries is not for everyone and certainly all growers will not want to be "certified". However, for some growers, this provides a new market of great potential. For others, it would be nothing but a reoccurring headache. Before committing to either production system, growers should always compare the

advantages/disadvantages of organic vs. non-organic (chemical) production of blueberries.

Fertilization: Although most Missouri blueberry growers use inorganic (chemical or synthetic) fertilizers, there are organic sources to meet the nutritional needs of plants. Feather meal, blood meal, soybean meal and soluble fish meal are excellent sources of nitrogen, while steamed-bone meal and seaweed powder are organic forms of phosphorus and potassium, respectively. Potassium chloride (mined) fertilizer can be used if applied in a manner that minimizes chloride accumulation. Other mined substances of low solubility, such as rock phosphate, are also allowed. Synthetic substances, including elemental sulfur (S), soluble boron (B) products, magnesium sulfate (Mg & S), and most micronutrient (except those containing nitrates or chlorides) sources can be used as soil amendments in organic crop production.

Although raw and composted animal manures are permitted as soil amendments, they are not recommended for blueberries because of their alkaline (basic) content. Heavy additions of manures tend to keep the soil pH above 7.0, a pH that is too high for maximum growth and production of blueberry plants.

The methods of applying organic fertilizers are no different than for many chemical fertilizers. Most of the organic fertilizers are solids and therefore need to be uniformly broadcast around the base of the plant. Using fertigation (fertilizing through the irrigation system) to apply organic fertilizers is much more limited than with the chemical fertilizers due to the low solubility of most organic materials.

One of the more critical factors when using organic fertilizers is the timing of the application. Organic fertilizers must be broken down (mineralized) in order for the blueberry plants to utilize the nutrients. This process takes time (2 to 6 weeks) and depends heavily on microbial activity in the soil/mulched area. Thus, it is essential that organic fertilizers be applied in advance of the time that the plants actually need the nutrient. On the other hand, the fact that organic fertilizers mineralize at a rather slow rate can be advantageous. Nutrients will tend to remain in the soil for a longer

period of time and may accumulate to a high enough level to actually reduce the amount of fertilizer needed in future years.

Regardless of whether organic or chemical fertilizers are being used to fertilize blueberry plants, regular (every 1 or 2 years) soil and leaf analyses are still recommended to monitor nutrient levels and adjust annual fertilizer rates.

Mulches: In Missouri, the use of mulches is an important cultural practice in blueberry production. A 6-inch layer of sawdust, wood chips or shavings around the blueberry plants helps retain soil moisture, reduces soil temperature fluctuations, improves the water to air ratio around plant roots, and helps suppress weeds. As the mulch decomposes, it also releases some nutrients for plant use. Since most (if not all) mulches currently being used are organic materials, they certainly meet NOP requirements. Hay, grass clippings, newspapers (without glossy ink), or other plant residues can also be used, but will need to be renewed more often as they decay much faster than the woody materials.

Irrigation: Blueberries need a readily available supply of water from early spring to late fall. Drip irrigation systems with individual emitters spaced no more than 2 feet from the blueberry plant provide adequate amounts of water in most plantings. At the present time, applying organic fertilizers through the irrigation lines is not generally recommended due to the low water-soluble nature of most organic fertilizers and increased problems with plugging of irrigation lines and emitters with these materials.

Weed control: Good weed control is difficult in any blueberry field, but it is particularly challenging for organic growers where no herbicides are permitted. Good site selection and eradication of perennial weeds such as Johnsongrass or Bermuda grass prior to planting is essential. In an established blueberry planting, options include: maintaining a 6-inch layer of sawdust, wood shavings or pulverized bark around plants to reduce weed pressure, shallow cultivation with mechanical cultivators, and hand hoeing or pulling weeds. Weeds compete

with blueberry plants for water, nutrients, and sunlight, harbor disease and insects, and generally cause poor plant growth and reduced berry production.

Disease control: Good site selection and soil preparation, healthy plants from the certified nurseries, and good sanitation practices are keys to controlling diseases in blueberry plantings. Good soil drainage is a major factor in reducing the potential problems from many of the soil borne diseases that infect blueberries. Soils located in low lying areas or sites that are poorly drained should be avoided when selecting a planting site. Drainage in some soils can be improved enough through the use of raised beds/berms or by incorporating heavy amounts of organic matter (compost, peat moss or green manure crops) prior to establishing the planting. Annual pruning of plants and removal of the clippings from the field also go a long way in preventing many disease problems. Pruning equipment, shears, loppers, saws, etc. should be disinfected frequently with a 20% bleach solution. Removing the clippings and rouging diseased plants from the planting are probably the best ways to prevent the spread of disease inoculum. Some synthetic compounds, such as copper sulfate and copper hydroxide, hydrated lime, hydrogen peroxide, elemental sulfur, lime sulfur, and selected horticultural oils (dormant, suffocating, and summer oils), are on the NOP approved list for plant disease control.

Insect control: Insects (thus far) have not been a major problem for Missouri blueberry growers. A few growers have reported minor fruit damage and fall webworms infestations, but these usually haven't been severe enough to warrant using control measures. Several mechanical and biological (nonsynthetic) control methods can be used to control insects, if needed. Elemental sulfur, lime sulfur, horticultural oils (dormant, suffocating, and summer oils), insecticidal soaps, and sticky traps are approved for insect control in crops. Pheromones are also approved as an insect attractant.

Marketing: Growers normally have to develop their own markets for organically grown blueberries. While a few stores in larger cities, such as Springfield, St. Louis and Kansas City will buy or consign organic produce, most growers rely on farmer markets, roadside stands, U-pick, and word of mouth to advertise and sell their fruit. In general, organically grown blueberries bring a higher price than those produced using chemical or synthetic practices. The key to marketing organically grown blueberries is the same as marketing non-organic berries: "consistently provide consumers with high quality fruit". Growers should advertise their fruit as "organic" and set the price accordingly. "Certified organic" will assure customers that NOP standards for organically grown blueberries have been met.

Summary: USDA-NOP has established standards for organic growers and organizations to follow in order to become certified organic producers. Missouri has adopted these same standards and is currently working toward making grower certification a reality. These standards provide consistent rules and regulations for organic producers to follow. The cost of being certified as an organic produced this first year is \$100.00. Certification in future years depends on the sales the previous year, but cannot exceed \$500.00. Interested blueberry growers should contact Sue Baird, Program Coordinator Sue_Baird@mail.mda.state.mo.us for the MDA Organic Program for specific details.

Producing organically grown blueberries is certainly not for everyone, but the time is right for organically grown fruits in Missouri. Growers willing to put forth the effort and expense to meet the NOP/MDA standards and requirements for producing "certified organic" blueberries should find an exciting market for their berries.

Elderberry Development Project

by *Patrick Byers*

The SMSU State Fruit Experiment Station, Mountain Grove, and the UMC Southwest Research and Education Center, Mount Vernon, are cooperating on an elderberry development project. Andy Thomas, UMC, and Patrick Byers, SMSU, are the primary researchers involved in the project. We have spent the past 4 years of the project on the following studies:

Collection of wild elderberry germplasm

The elderberry development project began with inquiries from winemakers and juice processors for elderberries adapted to the Midwest. The existing named elderberry cultivars were selected in New York, Canada, and other areas with climates unlike that of the Midwest. Several of these cultivars have been tested in the past at Mountain Grove and elsewhere in the Midwest for adaptation. Based on these evaluations, Andy and I became convinced that native elderberry germplasm offered great potential for improved cultivars adapted to the growing conditions of our region. Our initial efforts were assisted by Dr. Alan Erb, formerly of Kansas State University, and Mr. John Brewer, of Wildwood Cellars, Mulvane, Kansas. These individuals provided native elderberry selections from the collection at the John Parr Research Center, Wichita, Kansas. We also obtained as many commercial cultivars as possible for the collections. The collections at Mount Vernon and Mountain Grove continued to grow as a result of germplasm collection trips, and with plants provided by elderberry enthusiasts in Missouri and Kansas. At present the collections include 37 selections and named cultivars. A wide range of information is gathered on the collection, including phenology, harvest dates, yields, umbel size, juice parameters, insect and disease susceptibility, hardiness, and plant growth measurements. This project is ongoing, with additional elderberry accessions added to the collections annually. Individuals with superior elderberry plants are encouraged to contact Patrick Byers or Andy Thomas.

Elderberry pruning study

Limited information is available on elderberry cultural practices. Growers producing elderberries as a processing fruit are interested in practices that minimize production costs and simplify management of the planting. Mechanization of production practices, such as pruning, would be of interest. Practices that concentrate ripening would simplify fruit harvest. With these thoughts in mind, Andy and I focused on elderberry pruning strategies. We established a replicated study of three selections/cultivars to study four pruning approaches in 2001. The cultivars in the trial include Adams 2 (a standard commercial cultivar), Netzer (a selection from Springfield, Missouri), and Gordon B (a selection from Osceola, Missouri). The four pruning strategies include removal of all shoots to the ground annually, removal of all shoots to the ground every second year, removal of 2 year old shoots only, and no removal of shoots. We initiated treatments in 2003, and plan to continue the study for at least 6-8 years.



'Gordon B' elderberry

Elderberry cultivar trial

A recent expansion of the elderberry development project is a replicated elderberry cultivar trial. Following several years of observations in the plantings at Mountain Grove and Mount Vernon, Andy and I have selected what we feel are ten superior elderberry selections. These selections originated from Missouri and Kansas. We plan to include two standard commercial cultivars, Johns and Adams 2, for comparison to the selections.

The selections include Brush Hills 1 (from John Parr Research Farm, Wichita, Kansas), Netzer (from near Springfield, Missouri), Walleye (from near Wentworth, Missouri), Eridu 1 (from near Hartsburg, Missouri), Gordon B (from near Osceola, Missouri), Gordon E (from near Osceola, Missouri), Votra (from near Wheatland, Missouri), Competition 5 (from near Competition, Missouri), Highway O (from near Competition, Missouri), and Harris 4 (from near Golden City, Missouri). We will evaluate the cultivars/selections in the trial for a minimum of 5 years, and hope to release several new cultivars as a result of the trial.

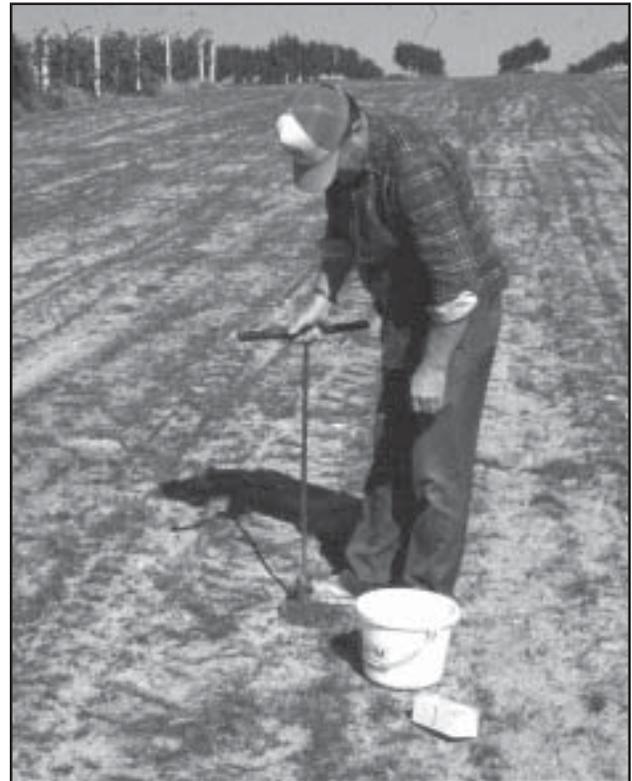
Support and cooperation

The majority of the support for the elderberry development project is provided by the SMSU State Fruit Experiment Station and the UMC Southwest Research and Education Center. We have hopes of receiving funding from the USDA National Plant Germplasm Project to support the replicated selections/cultivars trial. Dr. Chad Finn, of the USDA Horticulture Crops Research Laboratory, Corvallis, Oregon, has also begun a preliminary evaluation of our Midwest material at the research laboratory, and is serving as consultant to the project. We particularly appreciate the elderberry enthusiasts who identified superior wild plants, and provided these plants to the project.

Vegetables - Fertilize for Quality and Production

by Gaylord Moore

Back issues of the Berry Basket noted the importance of soil testing production fields to determine fertility levels, organic matter and soil pH.



Soil sampling for analysis to determine fertilizer need.

Your soil test report can often make you money by saving money. Whether money is tight or not, there is no need to overfertilize fields since this added fertility is wasted. On the other hand, when maximum production is expected, especially under ideal growing situations such as irrigated fields, you want to be certain that various plant nutrients are not limiting production. The cost of a soil test is possibly the best money spent in your farming operation. Now is the time to do it, so don't put it off.

Plant nutrition is something often difficult to understand. All nutrients required for plant needs must work together to bring out the best of quality and production. A deficient nutrient required by the

plant may hinder the uptake of another nutrient even though it may be in ample supply in the soil.

It is important to know the nutrient needs of all the various vegetable crops you produce. Some crops are more demanding for specific amounts of plant food than others.



After mixing 10 cores of soil taken from the sample area, approximately 2 cups are removed and put in the sample box to submit to the local extension office to be sent to the soils laboratory for analysis.

It is also important that your soil test report indicate supplemental amounts of nitrogen needed based upon your soil cation exchange and organic matter content. Generally, the higher the organic matter of the soil, the less supplemental nitrogen will need to be added. Only your soil test report will tell you percent organic matter content.

Be aware that side-dressing plants with nitrogen at various stages of plant maturity is important to maximize nitrogen efficiency. Production and fruit quality can be greatly affected by the amount of nitrogen used and the timing of nitrogen application. Nitrogen needs of vegetable crops may vary tremendously depending upon the species. Nitrogen credits may be given for legume crops that were previously grown and plowed under as a green manure, since legumes add nitrogen to the soil.

For additional information on soil testing or questions on nutrient requirements of various vegetable crops e-mail me at mooreg@missouri.edu or phone 417-862-9284.

Cherries, Apples and Quince on a Path Down Memory Lane

by Susanne Howard

I have recently returned from a trip to Germany to visit my family as well as two fruit research and grape breeding institutes in the southwest part of the country.

It had been 12 years since I visited Germany, and my very first impression on leaving the airport was: Yikes!! Soooo many cars, such narrow lanes and all that **speed!** I decided to do most of my sightseeing on foot. While there were a number of new developments, including several 'wind parks' for the production of electricity, much of the surrounding area changed surprisingly little. What had changed is the way I look at things. Since my last visit, I had trained as a horticulturist. I looked at the cherry 'Allee' and the little cherry orchard in the middle of town with new appreciation.

Germany has a long history of sweet cherry culture. Hildesheim, which I consider my hometown, is situated in a valley surrounded on several sides by hills. On these hills were once planted the orchards and on nice spring days you could watch parts of the hillsides turn white with cherry blossoms. Then of course along came urban development and most orchards vanished. In one development, though, a few trees were left standing during construction of the single family homes. Imagine getting a fully productive cherry tree along with your new house! I for one would be very happy with that.

In Himmelsthuer, the part of Hildesheim where my Mom lives, a different approach was taken: a small part of the cherry orchard was left standing. You can see in the photo (page 7, lower left) that each tree has a number painted on its trunk. The trees receive minimal maintenance by the City and every year, shortly before harvest, the trees are auctioned off. Whoever buys a tree can pick all the fruit on that tree! What an interesting way of utilizing a small orchard and keeping a tradition alive.

Another reminder of past fruit culture is a nearby 'Allee'. An allee is not an alley, but rather a regular sized two-lane road lined with trees. This form of landscape can be found anywhere in Germany. Often apple or pear trees were used to line the roads, but here, there are cherry trees lining the road. I could not determine how old the trees were. The trunks were easily 24 inches diameter. These trees are not pruned or cared for in any way, they are exposed to salt in the winters, and yet they survive and bear fruit every year.

These older trees all were 30 feet tall or taller. In fact, one of my favorite childhood memories is climbing into our cherry tree to eat the fruit right off the tree. Full size trees like that require a lot of room and are hard to harvest commercially. They also take several years to come into full bearing. In the past 5-6 years, new dwarfing rootstocks developed for cherries have become widely available, opening up new opportunities for cherry growers. These rootstocks were bred from several shrub type cherry relatives and are now widely utilized in Germany. They are called Gisela rootstocks, after one of the breeders. Gisela 5 is the most common rootstock in Germany today, and Gisela 6 is the one most used in the US. Cherries bloom early, making their flowers susceptible to late winter frosts. The fruit is also very sensitive to hail damage and excessive rain around harvest. The general opinion seems to be that the relatively high price obtainable for fresh market cherries makes it



Cherry trees in Himmelsthuer with numbers painted on the trunks.



Vintage photo of a pear allee flanking a walk to a garden bench from Garden Magazine, October 1922, Doubleday, Page and Co. The word "Allee" is from Old French "aler" meaning "to go" and refers to a walkway or drive bordered by rows of evenly spaced, even aged trees of the same species. Allees were popular in European estates in the 17th and 18th centuries and in the late 19th century in America.

economically feasible to install sprinkler systems for frost protection and overhead netting for protection from hail and excessive rain around harvest. It seems to me that similar considerations could apply to Missouri conditions as well.

A few other interesting bits of information gathered visiting the research station Geisenheim were the development of new dwarfing rootstocks for pears ("Pyrodwarf", "Pyroplus") not related to quince and more compatible with most pear varieties, and the development of more columnar apple varieties. This tree form might be the way to grow apples in the future, since they are highly productive, very precocious, do not require support or trellising, and require only minimal, easy-to-teach pruning. For those of you that are always on the

search for new, different fruits: try *Chaenomeles cathayensis*, the Chinese quince (related to the flowering Japanese quince). This is a very thorny, upright growing, large shrub or small tree. Trained as a shrub and planted closely as a tall hedge, nothing will get through it. It might even work to deter deer! The fruit is large, extremely high in malic acid and is being considered by the food industry as a source for natural, extractable malic acid for use in other food products. According to a release from Purdue University, *C. cathayensis* as well as *C. japonica* and *C. speciosa* are also being used to produce syrups, liqueur, candy and jelly in northeastern European areas. Juices, wines, puree and pectin extracts are other possible uses for these fruit.



A "red" orchid at Berggarten Hannover.

After I returned to my home town, I had one last chance to visit the greenhouses belonging to the Berggarten Hannover. This is a botanical garden as well as a large formal garden, and since it is close we used to visit these gardens a lot. Not much growing outside in March yet, but in the greenhouses were all kinds of beautiful orchids in bloom and even vanilla beans on the vanilla orchid. I took lots of pictures and packed lots of wonderful memories with me on the plane back to the US the next day.

Peonies for the Home Landscape

by Jennifer Barnes

Peonies are a favorite of many in the flower garden. They are long-lived perennials that produce large flowers in the spring. Their exquisite large blossoms, often fragrant, make excellent cut flowers and the foliage provides a background for annuals or other perennials. Colors include pink, crimson, rose, scarlet, white, yellow, purple, and cream.

Peonies grow best in full sun, but will tolerate light shade. Best growth is in soil with a pH range of 6.5 to 7.0, deep, rich in organic matter, and well-drained. Roots will quickly rot in poorly drained soil. Peonies require a cold winter to flower, so to encourage flowering, plant on a northern exposure and do not mulch in the winter. Mulch peonies each spring with a 2-3 inch layer of mulch to control weeds, conserve moisture, and to keep the soil cool. Remove the mulch in the fall. Apply a low nitrogen fertilizer such as 5-10-10 at the rate of 2-3 pounds per 100 square feet in the spring when the stems are about 2-3 inches high. Overfertilization, especially with nitrogen usually results in weak stems and reduced flowering. To prevent the large flowers from breaking or bending over during a strong wind or rain, plants should be staked.

Remove flowers as soon as they fade to prevent seed development, which can use up needed food reserves. The faded flower should be removed just below the flower, leaving as much foliage as possible. Cutting flowers for enjoyment in the home can also reduce the flowering in future years. Do not use more than one-third to one-half of the flowers for cut flowers and leave as much foliage as possible on the plant. Planting, transplanting, and dividing peonies is best done in early fall, but may be done in spring as soon as soils are workable.

Peonies have few pests or problems. The most frequently occurring pests are botrytis blight and leaf blotch, both fungal diseases. Especially prevalent during wet springs, botrytis affects leaves, stems, and flowers. Spots appear on leaves, stems soften and decay, and flowers either rot or buds

blacken and fail to open. Prompt removal of infected material and a thorough fall clean-up are essential for control. There are fungicides labeled for botrytis. Always follow label directions. Also, avoid overhead irrigation. Often you will see ants on your peonies. They like to feed on the sweet, sticky secretion which covers the flower buds. Very little direct damage results from their feeding, therefore you should leave them alone.

A common problem of peonies is failure to bloom. The following is a list of possible reasons:

- ♦ Planting too deeply
- ♦ Immature plants
- ♦ Excess nitrogen
- ♦ Inadequate sunlight
- ♦ Overcrowding
- ♦ Phosphorus or potassium deficiency
- ♦ Insect or disease problems
- ♦ Competition from roots of nearby plants
- ♦ Late freezes

Spring Flowers Brighten Landscape

by Jennifer Barnes

Spring flowering bulbs add cheerful color to early spring landscapes. Brilliant yellow daffodils, sparkling blue scillas, glistening white snowdrops, regal purple and gold crocus and a rainbow of tulips are welcome sights after the dreary days of winter. By late April, many of these spring blooming bulbs have lost their glory, and instead present an unkempt appearance in the landscape. Flowers are all bloomed out and foliage has begun to take on a worn look.

When they reach this stage, there is a temptation cut them back to remove the dying foliage. To have blooms next year, it is important to leave the foliage alone until it has died down naturally. Wait until the bulb foliage turns yellow or brown before removing it. As long as the leaves are green, they are producing food to build up the bulb for next year's spring flowers.

While you're waiting for the foliage to die down, summer flowering annuals may be

transplanted around the withering bulb crops to brighten the flower bed once again. By the time the annual flowers grow to fill in the space, the bulb foliage will have died back and can be removed. Be careful not to dig too deeply while transplanting the summer annuals over the bulbs, and stick to low-water requiring flowers to avoid over-watering the dormant bulbs. Excessive moisture through the summer months could create root rot problems for the bulbs, and result in poor bloom the following year. Marigolds, zinnias, cockscomb, gazania, and globe amaranth are several annuals adapted to dry soils.



Daffodils on a path to the front door.

If spring flowering bulbs were not fertilized earlier in spring, there is still time to give them a light fertilization. Use fertilizers formulated for bulbs which can be found at most garden centers. If none are available in your area, use a fertilizer such as 5-10-5 at a rate of about 3 pounds per 100 square feet of bed area. Work it lightly into the soil around the area where the bulbs are growing, but do not scatter it so granules fall down into the leaves of the clumps. Any granules that do fall on the leaves should be washed off.

Farmers' Market Workshop

by Lisa Kicklighter

On Friday, February 28, 2003, the Missouri Department of Agriculture conducted a workshop entitled "Developing and Enhancing Farmers' Markets". The speakers were Tammy Bruckerhoff of the Missouri Department of Agriculture in Jefferson City and Bob Chorney, executive director of Farmers' Market Ontario in Ontario, Canada. Mr. Chorney has helped organize approximately 80 new Farmers' Markets and has consulted farm, government, business, and community groups across Canada and in many parts of the United States. More than 50 people from Springfield and surrounding communities wishing to develop and/or start a farmers' market in their area attended.

A community supported farmers' market benefits everyone. Consumers get to buy locally grown, fresh produce and support the people who produce it. The farmers get to sell their product directly to the public at retail cost rather than wholesale to a middleman. And statistics show that the community benefits from the "ripple effect". When folks are in town to shop at the farmers' market they will buy gas, eat lunch, get other groceries, and shop at other local stores. In our day of heightened terrorism awareness and possible impact on our food supply, purchasing locally grown produce makes even more sense.

The workshop not only emphasized the reasons to have a local farmers' market, but also provided us with the tips on how to enhance new and struggling ones. It was stated that the successful market is "community driven and producer based". It must be desired by and supported by the community if it is to succeed. Also, the vendors have a responsibility to provide their best product for purchase. It must be a partnership venture.

Clearly in this day and age it makes sense to buy the food your neighbor grows! As we all look forward to spring planting let us determine to support our local farmers' market this year and see what an impact we can make on our community and the lives of others.

Editor's note: Lisa Kicklighter is a grower and farmers' market vendor from Mountain Grove who we are pleased to have as a guest writer for our Spring issue.



Lisa Kicklighter and Bob Chorney at the Developing and Enhancing Farmers' Markets Workshop.

Market Tips

by Marilyn Odneal

I attended the Farmers' Market Workshop in Springfield on February 28 as well. This was one of a series of workshops held throughout Missouri by the Missouri Department of Agriculture. Mr. Bob Chorney, the executive director of the Farmers' Markets of Ontario shared many tips and techniques to enhance farmers' markets in Missouri. Here are just a few.

Slogans, banners and signs. Slogans help tell the farmers' market story and help sell products as well. Examples include "Fresher by a country smile", "Come for the freshness, stay for the fun" or "Buy the food your neighbor grows".

A banner with your particular farm name should be placed above and in back of the selling area or table so that it can be seen from a distance and people in front of your table will not block it from view. Your farm name, displayed clearly, will help your customers identify you and find your booth in later weeks. Color and a consistent style is important in building your identity. Ball caps and shirts with your colors and farm name can also help promote your business and identify your stand. One of the attendees told us that their operation was named “Farm of Hard Rocks” offering Missouri grown produce of course.

Signs are also very important. Keep produce signs visible and clear. Put a price on each and every product. A paint stick can be used to hold the sign above the produce. An effective price sign format consists of the name of the produce, 3 bullets explaining why the customer should buy it, and the price. An example is:

Jersey blueberries

- Fresh picked
- Great for baking
- High in antioxidants

\$2.00 per pint

Produce can be pre-weighed, put in a bag set in a display basket, and priced according to weight. It is ready to be lifted, sold, and replaced by another.

Consistent pricing for quality produce. It is important to price produce according to what it costs you to produce and what it is worth. Price should reflect the fact that you offer high quality, freshness, and information on exactly how it was grown, when it was picked, and how it was handled prior to sale.

Don't lower prices later in the day. Don't lower prices to run specials. Instead, a customer appreciation day or a seniors' day can be held with the addition of free coffee or snacks, not by lowering the produce prices. Don't compromise your quality, and don't compromise your price.

The right mix. Farmers' markets should consist of a critical mass of local producers (not wholesalers) with the right product mix. Two of each item is fine. Fresh, local produce should be

available in abundance. You may have artisans and crafters, but only 1 for every 6 or 7 or 8 produce sellers. Fresh fish, scooped out of the barrel and sold live to customers in plastic bags full of water, is a relatively new item that fits well. Although markets generally do not handle meats, orders for poultry and meat can be taken at the market for later delivery.

Stay right on time. Consistent hours of operation should be held and vendors should be ready to go at the opening of the market. Do not open before your advertised time. It is not fair to the customers who trusted your advertisement. Consistent operation days and times will help people remember when to anticipate their next visit.

There were many more great ideas presented at this excellent workshop. Tammy Bruckerhoff of the Missouri Dept. of Agriculture organized the series and we hope it will be offered again next year.

Sell What You Grow

by Suzi Teghtmeyer

The time is quickly approaching when fruit and vegetable growers will be out marketing their wares. The catch is, how well will they market or advertise, thereby attracting that elusive buyer? Unfortunately the adage “build it and they will come” doesn't follow through to “sell it and they will buy”! So, to give you a marketing push, I've described several websites and books providing methods to attract the hungry buyer to your stand. The links mentioned throughout the article are also on the Fruit Science: Pomology Links page (under Marketing) of the Paul Evans Library homepage: <http://library.smsu.edu/paulevans/>.

This first site is actually a page full of extensive marketing links. The website, **The Horticultural Business Information Network: Direct marketing**, describes more than 25 sites and books concerning the marketing of fruits and vegetables. To make finding the links easier, I have listed this webpage's address, so you can just click on the appropriate title below. Most titles come up in pdf format. Type in: <http://www.utextension.utk.edu/hbin/> then click on the 'Direct Marketing' box.

Direct Marketing Guide for Producers of Fruits, Vegetables, and Other Specialty Products

This is an excellent, 40 page document that covers the methods and details of different direct marketing strategies (Pick-your-own, farmers' markets, deliveries, etc.). Included is a detailed chapter on "Advertising and Promotion Strategies" which raises the necessary questions a seller must ask and solve in order to be successful.

Marketing Alternatives for Specialty Produce

This guide from the Pacific Northwest identifies and illustrates many of the marketing options and costs for growers of specialty crops. Worksheets are included to aid in estimating postharvest costs including transportation, packing and of course, marketing.

Direct Farm Marketing and Tourism Handbook

This online guide is designed to help farm operators and individual growers market their products and services directly to consumers. Each detailed chapter is linked individually to its own pdf file where the subject is explained and examples drawn from real-world producers. Many of the chapters address tree and small fruits as well as vegetables.

Direct Marketing of Farm Produce and Home Goods

This handy, 28-page booklet helps the marketer determine the method that is best for their product and situation. In the merchandising category the reader will find the topics; pricing, advertising, and displays. Other chapters handle employee matters, customer complaints, financial planning and regulations.

Another website with links is **Value Added and Niche Marketing** from the Western Risk Management Library at <http://agecon.uwyo.edu/RiskMgt/marketrisk/MarketValueAdded.htm>.

I have selected a few of the articles and guides to accentuate here, but encourage you scan through the site for other articles that apply to your operations. The articles are in pdf format.

Farmers Markets: A Guide to Starting, Operating, and Selling

This 10-page guide begins with instructions as to organizing a new farmers market operation, then how to make it successful. It covers how to effectively market and price your produce, advertise to draw in the buyer, and work with rather than against fellow marketers to both sell more.

Pricing

Pricing describes various methods to best determine the marketable price for your produce. Techniques include price comparisons with competitors, calculating the maximum profit possible when all costs are considered, discount days and events, and how to handle money: cash, check, or charge?

Product Position

Product position refers to consumers' opinions of your product (e.g., lowest price, best service, freshest produce, 'certified residue free,' easy access, etc.) when they are making a purchase decision. The guide uses many graphs to smartly illustrate how consumers react to the above. The data for the graphs and charts were collected through consumer studies conducted by the Packer and published in their Fresh Trends Profile Studies. The guide continues with hints and tips for you to take the information and apply it your operation.

Roadside Stands: Should I Grow Fruit and Vegetables?

This guide addresses the issues involved with running a roadside stand. Location, hours of operation, buildings and facilities, displays, advertising, pricing, and legal considerations are the sections described in detail, and encourage the seller to plan the operation well in advance in order to be safety-conscious and successful.

Pick-Your-Own Markets: Should I Grow Fruits and Vegetables

This is an article that can help you examine your crop area and design the best layout possible to hold a PYO operation. It looks at sales areas, parking facilities, restroom facilities, signs and even advertising considerations.

In addition to the links above are two more sites worthy of attention:

Commercial Strawberry/Raspberry Industry
http://www.agric.gov.ab.ca/agdex/200/230_830-1.html

This is a Canadian factsheet (16 pages printed) whose concepts are relevant to growers everywhere. The marketing section delineates methods proven successful for marketing strawberries and raspberries. U-pick (you-pick, PYO) operations, farm gate sales, farmers markets, and marketing basics specific to these berries are described at length. Beyond the marketing section is comprehensive information regarding berry farm establishment (where and where not), economic and financial considerations, and production and regulatory basics.

Vegetable Growers' Handbook

<http://aggie-horticulture.tamu.edu/extension/veghandbook/index.html>

The information is appropriate for both vegetable and fruit growers. Chapter 2, Marketing (15 pages when printed), fully describes marketing methods, pricing, product containers, and the hours of operation necessary for a profitable venture. This chapter also describes the pros and cons of managing your own stand, as well as working with third-party vendors and retail outlets.

Last but not least, here are three books that are referred to often and are summarized below:

Produce Handling for Direct Marketing by James A. Bartsch and Roger Kline. Ithaca, NY: Northeast Regional Agricultural Engineering Service, Cooperative Extension, 1992.

This NRAES publication is valuable for growers who sell fruits and vegetables at roadside and farmers markets. It describes postharvest physiology, food safety, produce handling from harvest to storage, refrigerated storage, and over forty individual fruit and vegetable handling and display techniques. It is available through the NRAES website: <http://www.nraes.org/>.

The New Farmers' Market: Farm-Fresh Ideas for Producers, Managers & Communities by Vance Corum, Marcie Rosenzweig, Eric Gibson. Auburn, Calif.: New World Pub., 2001.

This book is a well-organized manual to farmers' markets (FM/s). Divided into three sections, the authors first describe how to be a profitable FM seller, from filling a niche market to display and packaging options. The second section describes how to set up a new FM including attracting (and keeping) sellers, management issues, sponsorships, and market promotion. The third section is how to take a FM to another level: expansion, community outreach, and Internet-based advertising and distribution. Throughout the book the authors draw on marketer testimonials and quotes, and insert pertinent snippets from magazines, newsletters, and other publications. The appendix includes additional articles addressing insurance needs, profitability, and public opinions and surveys. There is also a detailed bibliography and list of resources. This title is widely available in bookstores.

Sell What You Sow: The Grower's Guide to Successful Produce Marketing by Eric L. Gibson. Carmichael, Calif.: New World Pub., 1994.

Sell What You Sow is geared for growers who are willing to put the extra time and effort into planning and implementing a successful marketing plan. The first chapter begins at grower ground zero, evaluating the market in order to grow a unique product to fill a niche, and following through by developing the necessary business and marketing plans. The second chapter describes different means and venues to market the produce. Further chapters focus on selling products to retailers, wholesalers, and specialty food outlets. Marketing skills, business matters, and promotion round out the remaining chapters. The appendices include references to resources, and handling and displaying options for specific fruits and vegetables. This title is widely available in bookstores.

Soil Temperature and Vegetable Seed Germination

by Gaylord Moore

One thing that all gardeners should have in their bag of tricks is a soil thermometer. Soil temperature determines how fast various vegetable seeds will germinate. Knowing the best soil temperature for the particular vegetable seed you

are planting will insure faster germination and a better chance of success. Slow germination means that the developing plant is in this very vulnerable stage for a longer period of time. The following two tables will help you determine, based on your soil temperature reading, the best time to plant various vegetable seeds. To take a soil temperature, insert the thermometer a minimum of 2 to 3 inches. Check the temperature after approximately two minutes.

Days Required for Seedling Emergence at Various Soil Temperatures from Seed Planted 1/2 in. Deep									
Vegetable	Soil Temperature °F								
	32°	41°	50°	59°	68°	77°	86°	95°	104°
Asparagus	NG ¹	NG	53	24	15	10	12	20	28
Lima bean	-- ²	--	NG	31	18	7	7	NG	--
Snap bean	NG	NG	NG	16	11	8	6	6	NG
Beet	--	42	17	10	6	5	5	5	--
Cabbage	--	--	15	9	6	5	4	--	--
Carrot	NG	51	17	10	7	6	6	9	NG
Cauliflower	--	--	20	10	6	5	5	--	--
Celery	NG	41	16	12	7	NG	NG	NG	--
Sweet corn	NG	NG	22	12	7	4	4	3	NG
Cucumber	NG	NG	NG	13	6	4	3	3	--
Eggplant	--	--	--	--	13	8	5	--	--
Lettuce	49	15	7	4	3	2	3	NG	NG
Muskmelon	--	--	--	--	8	4	3	--	--
Okra	NG	NG	NG	27	17	13	7	6	7
Onion	136	31	13	7	5	4	4	13	NG
Parsley	--	--	29	17	14	13	12	--	--
Parsnip	172	57	27	19	14	15	32	NG	NG
Pea	--	36	14	9	8	6	6	--	--
Pepper	NG	NG	NG	25	13	8	8	9	NG
Radish	NG	29	11	6	4	4	3	--	--
Spinach	63	23	12	7	6	5	6	NG	NG
Tomato	NG	NG	43	14	8	6	6	9	NG
Turnip	NG	NG	5	3	2	1	1	1	3
Watermelon	--	NG	--	--	12	5	4	3	--

Adapted from J. F. Harrington and P. A. Minges, Vegetable Seed Germination, California Agriculture Extension Mimeo Leaflet 1954.

¹No germination

²Not tested



The soil thermometer pictured on the left has the minimum soil temperatures required for germination of various vegetable seeds listed conveniently on the dial.

Soil Temperature Conditions for Vegetable Seed Production ¹				
Vegetable	Minimum °F	Optimum Range °F	Optimum °F	Maximum °F
Asparagus	50	60-85	75	95
Bean	60	60-85	80	95
Bean, Lima	60	65-85	85	85
Beet	40	50-85	85	95
Cabbage	40	45-95	85	100
Carrot	40	45-95	80	95
Cauliflower	40	45-85	80	100
Celery	40	60-70	70 ²	85 ²
Chard, Swiss	40	50-85	85	95
Corn	50	60-95	95	105
Cucumber	60	60-95	95	105
Eggplant	60	75-90	85	95
Lettuce	35	40-80	75	85
Muskmelon	60	75-95	90	100
Okra	60	70-95	95	105
Onion	35	50-95	75	95
Parsley	40	50-85	75	90
Parsnip	35	50-70	65	85
Pea	40	40-75	75	85
Pepper	60	65-95	85	95
Pumpkin	60	70-90	95	100
Radish	40	45-90	85	95
Spinach	35	45-75	70	85
Squash	60	70-95	95	100
Tomato	50	60-85	85	95
Turnip	40	60-105	85	105
Watermelon	60	70-95	95	105

¹Compiled by J. F. Harrington, Dept. of Vegetable Crops, Univ. of California, Davis.

²Daily fluctuation to 60°F or lower at night is essential.

Agriculture Department Advises Producers to Review Worker Protection Standard *by Paul André*

Missouri Department of Agriculture officials are urging producers to include a review of the federal Worker Protection Standard in their preparations for this year's planting season.

"While the land is largely dormant at this time of year, we know that producers are already planning for spring planting," said Lowell Mohler, director of the Missouri Department of Agriculture. "It's during this planning process that growers need to revisit the safety measures they take to protect themselves and their employees when applying pesticides and ensure they are complying with the Worker Protection Standard regulations."

The federal Worker Protection Standard went into effect in 1995 to protect agricultural employees from pesticide exposure. The regulations apply to farms, nurseries, greenhouses, and forestry operations where pesticides are applied. The state agriculture department is responsible for administering the federal regulation in Missouri.

The Worker Protection Standard requires growers to train employees, provide decontamination materials, notify workers of pesticide applications and provide emergency assistance if necessary. Workers must receive basic training so they are aware of pesticide concerns before entering a treated area. That training should be documented by the employer.

"We continue to work with growers and industry groups to assist with compliance and ensure employees are protected from pesticide exposure," Mohler said. "We want to make sure employees are properly trained and posted information is complete."

The federal regulation also offers specific instructions on following pesticide label requirements and providing personal protective equipment. Producers should familiarize themselves with the pesticides they are using, as well as the provisions of the Worker Protection Standard, so

they know they have the proper materials and equipment on hand to protect themselves and their employees, Mohler said.

For more information about the Worker Protection Standard, contact Paul André, pesticide program coordinator with the Missouri Department of Agriculture, 573-751-5504 or Paul_Andre@mail.mda.state.mo.us or visit the department's web site at <http://www.mda.state.mo.us>. Information and training materials are also available from county extension agents and agricultural safety companies.

Making Wine for Home Use *by Marilyn Odneal*

Some questions may arise if you consider making wine at home. Is it legal? Is it worth the effort? Are there a lot of complicated chemical equations involved? Actually, up to one hundred gallons of wine may be legally produced in a one-adult household, and up to two hundred gallons in a two or more adult household. Although it may be easier to buy your wine at the store, winemaking is an interesting and understandable process that can become a rewarding hobby. Most of all, by making wine for home use, you enjoy the satisfaction of serving your wine to friends and family and reliving your winemaking adventure over a wonderful dinner.

Wine is traditionally the product of fermented grapes. Red and white table wines range from dry to sweet and have less than 14% alcohol.

Sugar in the grape juice, through the activity of yeast, is fermented into alcohol in the wine. The equation for this chemical change is:

$C_6H_{12}O_6 \rightarrow 2 CH_3CH_2OH + 2 CO_2 \uparrow$ or literally one molecule of glucose (sugar) is fermented to yield 2 molecules of ethanol (alcohol) and 2 molecules of carbon dioxide gas (bubbles). The alcoholic fermentation also produces heat.

It is necessary to know the level of sugar in the juice you begin with. Sugar level is measured with either a hydrometer or a refractometer. By multiplying the sugar level (in °Brix) by a factor of 0.55, you can estimate the future alcohol level. You want a final alcohol level between 10 and 14% for



Racking white wine off of the sediment after settling into a clean carboy.

table wines so you need to start out with a juice that has a sugar level from 20 to 24 °Brix.

The *first* major step in the winemaking process is to extract the juice from the grapes. This step can be skipped if you begin with purchased fresh juice or juice from concentrate. The *second* major step is to ferment the juice and clarify and stabilize the wine. The *third* major step in winemaking is to bottle the wine and store it properly. The *last* step is to evaluate and enjoy your wine.

Making Wine for Home Use, by Karl L. Wilker, Tavis S. Harris, Marilyn B. Odneal and Murli R. Dharmadhikari, is a new publication for home winemakers with specific references on making wine from grapes commonly grown in Missouri. The procedures for making red and white table wines are presented and basic laboratory techniques are detailed.

The 42-page plastic comb bound publication is illustrated with black and white photos. It is available for \$3 + \$1.50 s&h from Pamela Mayer, SMSU-Mountain Grove Publications, 9740 Red Spring Road, Mountain Grove, MO 65711. It is also available free on the web at <http://mtngrv.smsu.edu/MWFHU/> in two formats; a web bulletin and a printer friendly pdf version.

Viticulture Field Day

The annual Viticulture Field Day is scheduled for Thursday, June 26 at the State Fruit Experiment Station, SMSU-Mountain Grove. Anyone interested in grape growing is invited to hear presentations of updated research data and to tour plantings and laboratories. Among the topics of interest will be site selection for vineyards and management of Chardonnay grape in the vineyard and the winery.

Viticulture Field Day is a great opportunity for grape growers and those considering involvement in grape production to gather and share information.

Preregistration is requested; as soon as the program details are finalized, complete information and a registration form will be available. Keep checking our homepage at <http://mtngrv.smsu.edu>.

Classifieds

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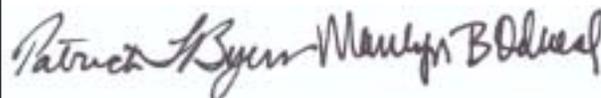
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