



The Berry Basket

Newsletter for Missouri Small Fruit and Vegetable Growers

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Annual Checkup

By Ben Fuqua

Professor, Soil Science, SMSU

Doctors say an annual checkup is a key to identifying problems in humans and, therefore, a vital part of any good health program. Likewise for blueberry growers, an annual checkup of the successes and challenges (problems) encountered during the past year is just as important when planning the next blueberry season. Blueberry growers need to evaluate all aspects of their operation, including plant health, cultural and operational requirements, and marketing/sales strategies. The fall months provide an excellent opportunity to review and reflect on the past blueberry season. As the days get shorter and temperatures drop, blueberry leaves begin to change colors and fall from plants, signaling that it is time to put an end to this blueberry year and start planning for 2005.

Nutritional Status: Soil and plant (leaf) tests provide information needed to make sound fertilizer decisions for the upcoming year. The most important number on a soil test for blueberry growers is soil pH. Highbush blueberry plants prefer acid soils; therefore, keeping the pH in the correct range is crucial for good plant growth and berry production. The recommended pH for Missouri blueberry plants is pHs(salt) = 4.5-5.0 (pH(water) = 4.8-5.2). Available soil phosphorus and potassium levels reported on the soil tests should also be noted and adjusted to the recommended levels if deficient.

Most fertilizer decisions for blueberry plants should be based on a leaf (foliar) analysis rather than the soil test. A foliar analysis measures the nutrient content in the leaf and is a more accurate

From the Editors

by Marilyn Odneal

We are enjoying the October rains after a rather dry September at Mountain Grove. As Ben Fuqua advises, the end of the year is a good time to plan and reflect - and how better to do so than with our autumn newsletter. In this issue you can travel to Germany with Dan Waldstein, to Washington D.C. with Suzi Teghtmeyer, or back to ancient times with Victor Matthews. If you wish, you can make your own plans to travel to Springfield, Missouri and attend the Small Fruit and Vegetable Conference in February, 2005.

We hope you enjoy the article on holiday plants and we send our best wishes to you for a Happy Holiday Season!

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measurement of what is actually getting into the plant. Leaf nutrient levels should be in the “adequate” range of nutrient contents established for blueberry plants growing in Missouri soils. Nutrient contents either higher or lower than the “recommended” values can reduce overall berry yields and quality.

Berry Quality: Producing high yields of quality berries are goals of all blueberry growers. Customers love (and expect) blueberries with good flavor and good handling/storage qualities. Berry yields, size, and quality are governed by a number of factors, including genetics (variety grown), extent of pruning, availability of plant nutrients, climatic conditions before and during harvest, berry ripeness when picked, harvest interval, bird problems, etc., and may fluctuate slightly from one year to the next. (Overall, Missouri blueberry growers have done an excellent job in producing a quality product that is highly sought by customers).

Blueberry yields vary somewhat from one variety to another, although most of the varieties recommended for Missouri should be producing 6-12 pounds of ripe berries per plant by the 5th harvest year. After the 5th year, yields generally tend to be fairly constant, with only slight variations from year to year.

Berry size is mainly controlled by genetics (as shown by comparing the fruit size of Jersey to Blueray or Chandler varieties), although berry size can also be greatly influenced by the extent or degree of pruning. While the goal in pruning is to balance the blueberry plant with a mixture of young, intermediate, and mature fruiting canes, it is often difficult to attain. A large number of small berries is indicative of little or no pruning or that the plant contains a high proportion of older, nonproductive canes. On the other hand, exceptionally large berries may imply that plants were pruned too heavily, perhaps even to the extent of causing a reduction in yield.

Cold summer temperatures and excess rain can cause a reduction in overall berry quality. Cool, cloudy days may delay berry ripening and also alter the frequency of berry harvest. Diseases, especially the fruit rots, thrive under wet, cool climatic conditions, resulting in the need of additional control measures to maintain high berry quality.

Pest management: Strategies used to control weeds, insects, diseases, and bird problems also need to be addressed. Excessive weeds (either perennial or annual) may indicate a need to develop alternative weed control measures, either chemical or mechanical. Renewing mulches to maintain a 4-6” layer around the plants is also a valuable tool in helping to control these unwanted plants.

Insects, in general, have not been a major problem in Missouri blueberry plantings. However, the Japanese beetle population seems to be increasing each year about the time of berry harvest and may warrant a “beetle” plan for 2005. Insecticides, insect traps, or other control measures may be needed to keep these destructive pests from causing extensive damage to ripe fruit.

Disease problems should be noted and plans made for removing any damaged plants. All diseased plants, canes, and branches should be cut, completely removed from the blueberry planting, and destroyed to prevent the spread of disease inoculums. Using good sanitation practices, by frequently disinfecting shears or other pruning tools, is also a must when removing diseased plant tissue.

Marketing and Sales: Advertising and marketing strategies must be constantly reviewed and updated. Customer lists will need to be updated, customer responses to advertisements assessed, and the overall marketing plan reevaluated. Selling ripe blueberries is one of the most (if not the most) enjoyable tasks of growing blueberries. Keeping customers happy by growing high quality blueberries is essential to the success of a blueberry enterprise. Happy customers are also one of the best forms of advertisements that growers have available.

Marketing strategies will also need to be updated as the blueberry plants mature. When yields increase, labor requirements to harvest and market ripe blueberries also increases. The amount of labor needed to harvest and sell berries for a U-Pick operation are quite different than the labor requirements to market pre-picked berries on the farm or at a farmer’s market. Thus, labor needs play an important role in any marketing plan.

CHECK LIST

		MY PLANTING		
Soil tests:	recommended	low	adequate	high
pHs	4.5-5.0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phosphorus	25-30 #/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Potassium	100-125#/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plant tests:	recommended	low	adequate	high
Nitrogen	1.50-2.10 %	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phosphorus	0.07-0.12 %	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Potassium	0.40-0.80 %	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Magnesium	0.10-0.30 %	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulfur	0.10-0.20 %	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Iron	40-79 PPM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boron	20-50 PPM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manganese	40-250 PPM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Berry Quality:		low	average	high
Yields	6-12 #/plant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Size	150-225 berries/pound	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		poor	good	v. good
Flavor		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Firmness		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fruit Color		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall Quality		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pest Management:		poor	good	v. good
Weed Control		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insect Control		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disease Control		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bird Control		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sales/Marketing:		poor	good	v. good
Advertising		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing Plan		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Berry Sales		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Labor Management		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Summary: How did you score in 2004? While several other items should also be evaluated before next year (irrigation system, depth of mulch, etc.), the above “check list” can help identify areas that need attention.

Treading the Winepress: Viticulture in the Ancient Near East

By *Victor H. Matthews* Associate
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If one were to search the textual records and agricultural evidence from the ancient Near East for a single product, aside from the olive, that had a particularly profound effect upon the economy and upon the sense of personal and collective prosperity, it would have to be the grape. From this single plant comes fresh fruit, raisins, raisin honey, grape juice, and wine. Its domestication and cultivation, as well as its introduction into ancient culture as a food staple and, in some regions, a luxury item has a long history. From Egyptian tomb paintings to Assyrian royal inscriptions to the words of the biblical prophets (see Isaiah 5:1-7 and Jer 25:30), grapevines and wine permeate the thought and literature of ancient society.

Domestication of the wild grape (*Vitis sylvestris*) began fairly early in both Egypt and Mesopotamia. Although there is no written record describing the process, there has been sufficient archaeological evidence uncovered to demonstrate the transformation from the wild grape to the domesticated variety (*Vitis vinifera*). The chief diagnostic indication of this process has been the size and shape of the grape pip (seed) - an elongation and longer beak appears in the domesticated plant. The earliest evidence available from sites in the ancient Near East for domestication of the grape comes from the Chalcolithic (ca. 3700-3200 BCE) and the Early Bronze Age (3200-1900 BCE).

Naturally enough, a certain amount of experimentation would have been necessary to develop size, color, and ultimately taste. It seems, for instance, that growing grapes from seed alone does not produce satisfactory results. The best means of insuring a consistent and marketable crop comes from taking cuttings from proven producers and by grafting branches from those plants that have produced superior fruit to new vines. In this way, entire groves of domesticated fruit could be established and recessive genes could be eliminated or minimized.

In addition, methods would have had to be invented to properly cultivate and prune the vine during the growth process. Irrigation techniques had to be initiated and tools constructed to harvest the fruit without damaging the vine. In some cases in Mesopotamia, in order to take advantage of limited space or to serve artistic or propagandistic purposes, the vines were trained to climb up the branches of trees. In the small holdings of ancient Canaan, vineyards were planted near the farmer's house and were mixed with orchards and sometimes trained to climb up the trees (see Ps 128:3; Cant 6:11). However, it is not clear how common such an arrangement actually was. In fact, several passages in Judges (14:5; 21:20-21) indicate that vineyards were some distance from villages. This may be simply a matter of a central location that served all of the inhabitants rather than privately owned vineyards.

The extraction of the juice took on various forms, from treading the grapes under foot to crushing it in wicker baskets above a catchment basin. Egyptian tomb paintings provide graphic depictions of this process. In these scenes the harvested grapes were first placed in a "treading trough" made of mud brick and sealed with a plaster surface. A group of men, holding on to a pole hung horizontally over the trough, then worked the grapes into a mash with their feet. The appearance of musicians nearby indicates that a particular rhythm was encouraged by their cadence. A further pressing process then occurs when the crushed grapes are placed into a sack or closed wicker basket that is stretched over wide-mouth jars and twisted by a team of three or more men.

And then, finally, the fermentation process - a delicate affair given the range of temperatures necessary for proper chemical transformation to take place - had to be mastered. For instance, the warm climate of the Near East brought on fermentation of grape juice very quickly and thus required continuous labor once the process of treading the grapes began. In the Egyptian Old Kingdom (2700-2200 BCE), the juice and the crushed grape pulp were left in a vat to begin fermentation and then later the slightly fermented juice was extracted using a press. A change in the process appears in the

New Kingdom (1550-1070 BCE) when the newly rendered juice is immediately placed in jars for fermentation. This necessitated the creation of the proper container – a succession of amphorae, mostly with pointed bottoms, can be traced in different time periods and places. It seems likely, however, that these jars were stored in an upright position in order to maintain the seal (generally a clay stopper and cap). Otherwise, contact with bacteria would have turned the wine to vinegar and contact with oxygen would have changed its color and flavor.

However, neither Egypt nor Mesopotamia exhibits the type of climate necessary for large-scale wine production. The high salinity in the soil in southern Mesopotamia supported barley, but it was not favorable to vineyards. As a result, wine remained a luxury item in Mesopotamia until the Assyrian empire was able, after 800 BCE, to draw sufficient quantities in tribute and taxes to be able to boast of its widespread use.

This meant that the most common drink, for daily consumption as well as social and ritual occasions, in Mesopotamia was beer. The brewing method begins with loaves of baked bread that are crumbled, transformed into a mash and then spread on mats to cool. A sweetening agent was sometimes applied to this mixture, probably composed of either date honey or grape syrup, creating what was known as “sweet beer.” The somewhat coarse liquid was strained and drunk through reeds or metal straws. Egypt’s people, like the Mesopotamians, looked to beer as their most common beverage. It was brewed from a portion of the barley crop, and was easily available to the average Egyptian household, which could brew it daily.

In Syria-Palestine, however, the more favorable climate and topography allowed for the maintenance of vineyards and their attendant installations (such as winepresses) in nearly every village in the hill country. A sign of just how pervasive viticulture was in the Israelite village culture is seen in a survey of the northern Israel where 117 winepresses of various types were discovered.

Such abundance meant that wine was able to serve as the common beverage in Syria-Palestine

and also became an aspect of everyday social life (Ruth 2:14; Hos 2:7; Dan 10:3). It serves as a libation offering in religious contexts, although this was sometimes condemned for its association with other gods (Deut 32:31-38). Wine also had the potential to become a source of social comment if it were used intemperately (Isa 56:12). Its value could also become a form of evidence of injustice to the poor, as it does in Amos’ indictment of those who profit from unfair fines (Amos 2:8). It may be assumed that when the biblical writers and prophets draw on the vine image there is an expectation that their audience is both familiar with the various aspects of viticulture and capable of making the connections alluded to by the speaker. For them the details of creating a terraced vineyard (Isa 5:1-2), planting, cultivating, and pruning the vines, and, after a six-year wait, harvesting the fruit would have been a part of everyday life.



A collection of amphorae (photo courtesy of Dr. Murli Dharmadhikari)

Soil Test Results a Valuable Tool for Vegetable Growers

Gaylord Moore

Horticulture Specialist, MU

Soil testing is like a bank account. You don't know how much is in reserve until you check the account. All serious commercial or home vegetable producers should be taking a soil test to evaluate the fertility levels and production capabilities of their soil. Following the soil test recommendations will help prevent underfertilizing or overfertilization. Not providing proper nutrients in sufficient amounts certainly reduces the production potential of vegetable crops. On the other hand, overfertilization can be costly and potentially damaging to the crop as well.

Soil test results for the commercial vegetable producers will give the amounts of nutrients needed based directly upon the crop produced. This gives the grower an opportunity to be crop specific and fine tune the needed nutrients and suggested time of application. For example, many crops require various amounts of nitrogen and are sensitive to when nitrogen should best be applied. Your soil test recommendations will give you that information.

Does your ground need lime? Only a soil test will give you that information. Does the pH already exceed the upper limits for maximum crop performance and production? Only a soil test will provide that information as well. Correct pH is the key to the availability to major and minor crop nutrients required for vegetable crops.

What is the organic matter level in your soil? Organic matter is the life of the soil and only the soil test will give you that information. Most growers are aware of the value of organic matter and in most instances are deficient in their production fields. To increase or even stabilize the organic matter levels in most soils a plan should be in place to do something yearly that will gradually build organic matter in your soil. Where applicable, taking land out of production to grow green manure or cover

crops for a year will enhance organic matter levels. In addition rotation crops will give other cultural benefits.

Okay. Now that I have convinced you of the value of the soil test, you may want to take one from your production fields. Therefore, you ask for the correct procedures for gathering a good soil sample. Correct sampling procedures are the key to confidence in test results. Bottom line, the value of the test is only as good as the sample that was collected and submitted.

A soil probe or tube is the best tool for collecting soil samples but you can use a shovel or spade for sampling. You should dig a hole to the proper sampling depth of 6 to 7 inches then shave a 1-inch slice from the side of the hole to the sampling depth of the shovel. Save the vertical, 1-inch wide center portion of the soil as one subsample. Place the subsample in a clean plastic container and repeat the sampling procedure throughout the field to be tested. A 10 X 10 garden may only require 5 or 6 subsamples whereas a 10 acre field may suggest 20 subsamples. Your object is to get the best soil representation of the entire garden or field. In general, the more subsamples you collect, the better. For each field or sampling area represented the subsamples should be thoroughly mixed together and a pint of soil collected in a clean container or plastic bag to be delivered to the testing lab or a University of Missouri Extension center. Some fertilizer dealers will also provide this service. More detailed procedures for getting a good soil sample is found in University of Missouri Agricultural guide G09110 available through your local Extension center. There is a nominal fee for the analysis through the University of Missouri Extension centers.

Fall is an excellent time to gather soil samples for testing. Fall and winter sampling allows more time for planning limestone and fertilizer programs for the coming year.

Help is available to help you plan your fertility program with the aid of the soil test results. Contact your local University of Missouri Extension horticulture or agronomy specialist in your area.

A Fruitful Trip to Germany

Daniel Waldstein Integrated Pest Management Specialist, SMSU

In July I received an invitation and a grant to speak at the “World Conference on Dosing of Antiinfectives- Dosing the Magic Bullets” and the “Ehrlich Symposia”. The conference was held in Nuernberg, Germany September 9-11. I arrived in Germany a few days early to visit fruit breeding research centers in two parts of the country.

My first stop was the Geilweilerhof grape breeding research institute located near the village of Siebeldingen in southwest Germany. Peter Morio started the grape breeding program here in 1926. While at Geilweilerhof I met with the institute’s grape breeder, Dr. Rudolf Eibach. Dr. Eibach visited the Missouri State Fruit Experiment Station in September 2003 to collect wild *Vitis* samples for his breeding efforts. The focus of his program is on disease resistant wine grape cultivars. The two most important grape diseases in Germany are powdery and downy mildew, although black rot has recently become a problem in some parts of Germany. One of Geilweilerhof’s disease resistant releases, ‘Regent’, is now grown on thousands of acres of vineyards throughout Germany. In the past, Germany’s wine industry was dominated by whites, but in the last few years, reds like ‘Regent’ have comprised the vast majority of new vines planted.

On Tuesday morning I left Geilweilerhof and headed east to Dresden. Fruit breeding research for apples, cherries, and strawberries is conducted at a research institute located just east of Dresden in the village of Pillnitz. While at Dresden-Pillnitz, I first met with the institute’s director, Dr. Viola Hanke, who specializes in plant biotechnology. Dr. Mirko Schuster, the cherry breeder, gave me a tour of the facility and explained his research to breed for disease resistant and self-fertile cherries. Later, I went out to the field plantings with Dr. Andreas Peil, the institute’s apple breeder. He showed me hundreds of selections including the “P” and “R” series of apples. The “P” series (e.g., ‘Pia’, ‘Pirol-Pirella’, ‘Piflora’, and ‘Pingo’) were bred for excellent

pomological characteristics. Although pomological characteristics were also an integral component of the “R” series (e.g., ‘Renora’, ‘Rebella’, ‘Regine’, and ‘Regia’), the main purpose of this breeding was disease resistance. Powdery mildew, apple scab, and fireblight are typically the three most important apple diseases in Germany.

The next day I gave my presentation entitled “The Use of Dyes in the Study of Microencapsulated Pheromone for Control of Oriental Fruit Moth.” I was the only American speaker in the section: Role of cells and their staining by dyes. More than 1,000 scientists attended the conference from 84 countries around the world.

On Friday morning I left Nuernberg and met a friend and former colleague of mine, Dr. Gellert Budjoso, in Eisenstadt, Austria. We went to an Austrian winery (Weninger), and had the opportunity to see several vineyards in eastern Austria.

On a non-fruit related note, I was very impressed with the condition of the freeway (Autobahn) system in Germany and Austria. It was a little stressful driving, however. The right lane is largely occupied by trucks that average about 50 m.p.h., while the left lane has cars driving from 80-120 m.p.h. or faster. There is an open border system between many countries in Europe including Germany and Austria, so it is similar to going from one state to the next in the U.S. Early September was a great time to go to Germany. Most of the fruit remained on the trees and vines, and the weather was sunny with lows in the 50s and highs in the 70s.



Dr. Waldstein next to disease resistant grape cultivar block at Geilweilerhof Grape Breeding Research Center, Siebeldingen, Germany.

McMurtrey's Harvest

By Marilyn Odneal

Horticulture Outreach Advisor, SMSU

Sonny McMurtrey planted his first 10-acre vineyard in 1970 with his brother. He rooted Catawba grape cuttings he collected from the Bacchus Vineyards just north of Mountain Grove to use for planting stock. Bacchus Vineyards were then owned by Dr. Robert Goodman and a partner. There was a good market for Catawba grapes in those days by virtue of Meyers in Cincinnati. This market did not last, however, and Sonny planted some French Hybrid varieties around 1976. Sonny's brother left the partnership in 1980.

Joyce, Dr. Goodman's daughter, and Sonny married in 1978. They have one daughter, Lucky, who has just started college. The McMurtreys purchased Bacchus Vineyards in 1991. Now they are the largest independent grape growers in the state of Missouri with 78 acres in production at three locations; the Dawson Vineyard, the Desert,



Lugs are filled, numbered and placed under the vines to be picked up and loaded at night.

and the Home Vineyard - where Sonny planted the first Catawbas. The varieties presently grown are Catawba, Concord, St. Vincent, Vidal blanc, Seyval blanc, Vignoles, Reliance and Norton.

This year McMurtrey Vineyards harvested record yields with an overall average of 7 tons/acre, up from their usual average of 5 tons/acre. "St. Vincent yielded 9-10 tons/acre and is hardening its wood well into winter" Sonny said "and Vidal blanc yielded 10 tons/acre, but may suffer for it next year".



Sonny McMurtrey

The photos in this article show both hand and mechanical harvesting at McMurtrey's vineyard in this record year - specifically hand harvest of Seyval blanc on August 17 and 18 and machine harvest of Vignoles on August 29 and Catawba on October 11. Although hand harvesting is more expensive (\$150/ton) compared to machine harvesting (\$25 - 30/ton cost of operation), it is done if the quality of the finished wine is improved. In the case of Seyval blanc, mechanical harvesting would



Mecca 1973 model mechanical grape harvester.



Vignoles grapes are mechanically harvested into 1-ton boxes.

crack the skins of the berries and off flavors that make the wine harsh would be extracted from the skins on their 3-hour trip to the winery. For this reason the Seyvals were hand harvested.

Hand picking begins at 7:00am in the morning and lasts until noon. The employees pick up their grape cutters and numbered cards from a station wagon with supplies near the parking area. Lugs or picking containers are set down the rows and fresh water containers are set out at the row ends. First aid supplies are also on hand. There were many people in the vineyard; male and female, young and old. Carol Dawson, a Master Gardener, says she loves the work “especially in the morning when the sun shines in back of the grapes and they glow. They look so beautiful.” As each person fills a lug, they put their number in the lug so that they receive payment for it. The lugs are placed under the rows and are picked up at 11 pm at night when they have cooled down. They are then dumped into 1 ton grape boxes which are covered and loaded on a tractor trailer for shipment to the winery.

Mechanical harvesting is done at night, usually midnight, so it is as cool as possible. Sonny purchased a used Mecca 1973 model harvester in 1978 when he could not get sufficient labor to harvest the grapes. The over-the-row harvester has fiberglass rods that beat the grapes off from the vines. The grapes are then conveyed on belts up over blowers through a tube and into 1 ton grape boxes tended by people who remove the extra

leaves and debris. The boxes are then covered, loaded on the trailer, and shipped to the winery. The harvester often needs repairs during the picking season, however, Joyce says that this isn’t a major problem because “Sonny can fix anything” and the machine uses common hardware parts.

Sonny and Joyce both love what they do. “Although the risk can be high and grape growing is not for everyone, it has been the most rewarding thing I have ever done” Sonny says. “With luck, it is a potentially profitable venture.” In the winter, it may cross Joyce’s mind to relocate nearer to the equator, but she admits “if I had to do it all over again, I would be doing what I am doing. Sometimes I feel like I’m living in paradise.”

When asked what varieties of grapes they are planning to plant in the future, Sonny said that he would just be putting in a few Concords next year since they have just about as many grapes as they want to handle. “After all, we need to start thinking about retiring” Sonny said to which Joyce added with spirit; “Retire! We aren’t going to retire! We’re gonna die with our (rubber) boots on!”



Joyce McMurtrey

Winterizing your Sprayer

By Patrick Byers

Fruit Grower Advisor, SMSU

A pesticide sprayer is often among the most expensive pieces of equipment used to produce fruit. Proper care and maintenance will prolong the useful life of a sprayer. Particularly important is proper winterization of a sprayer.

First of all, remember to always wear the appropriate personal protective equipment when performing winterization. Pesticide residues are present on the sprayer and present an exposure risk. Check the pesticides labels used during the season for guidelines.

The first step is to thoroughly clean the sprayer. Flush the sprayer tank, pump, lines, and nozzles with clean water. Add water to the tank again, this time containing a cleaning solution. Specific pesticide labels may list appropriate cleaning solutions. For most fungicides, ¼ pound of a powdered detergent per 25 gallons of water is adequate. Detoxify insecticides with the addition of 1 quart of household ammonia per 25 gallons. Flush the entire system with the cleaning solution, running agitation.

The next step is to remove spray nozzles, tips, screens, and discs, and flush the system twice with clean water. Check these pieces for damage or wear. Replace as needed. Clean these pieces in a detergent solution, and dry. Metal components may be stored in a container of light oil to prevent corrosion. Store plastic components dry. Following the winterization process, close the nozzle orifices on the sprayer with tape to prevent entry of insects, mice, and dirt.

If the sprayer has no rubber parts, add 1-5 gallons of a light weight oil to the final tank rinse to form a protective coating throughout the sprayer. Alternatively, following the final rinse add automotive antifreeze with rust inhibitor to the sprayer tank and distribute throughout the sprayer system, to prevent freezing damage.

Hoses used for handguns should be removed, cleaned, and coiled on a reel or similar object. Clean handguns with a detergent solution, paying particular attention to nozzles and tips.

Clean the entire outside of the sprayer, using a detergent solution and a brush. If possible, store the sprayer inside a building. Otherwise, cover the sprayer with a protective tarp or cover.

Airblast sprayers require several additional steps to winterize. Check your manual for specific procedures. First of all, lubricate the pump, then drain the crankcase and refill to the correct level with fresh oil. Drain the oil from the fan reservoir, and refill with fresh oil. Flush out the pump and all lines with fresh water as above. Drain completely, and leave all valves open. Drain the filter cup, if applicable. Check the condition of the pump valves, seats, cups, and cylinders. Check the condition of the regulator valve and seat. Order any new parts needed. Lubricate all bearings as if preparing for a day's spraying. For those sprayers with a motor, check the manual for guidelines to winterize the engine and battery.

'Tis the Season' to be Selecting and Caring for Holiday Plants

By Jennifer Barnes

Horticulture Specialist, MU

A decorated evergreen tree can be a wonderful addition to the house during the holiday season, but when not properly selected and maintained it can also represent a potential fire hazard.

The most important characteristics for choosing a Christmas tree are shape, color, branch distribution, and needle retention. Whether you cut your own or purchase one, always select one that is fresh. To check for freshness, look for a firm tree and bounce the trunk on the ground. If only a few needles drop, then you can assume the tree is relatively fresh. Another test is to bend the needles. If you can bend them without snapping them in half and the needles cannot be easily pulled from their stem, then the tree is fresh. Also look for resin at the base of the stump. A fresh, sticky flow will indicate that the tree has recently been cut.

Once you get the tree home, cut an inch thick section off the base of the trunk and place the tree in a container of water. This will allow water to be quickly absorbed into the tree. Keep plenty of water in the stand at all times. Do not allow the water reservoir to go dry, as this will allow air to get into the cut trunk and retard the future uptake of water.

The tree should be located in the house as far as possible from heat sources, such as a radiator, fireplace, or kerosene heater. Carefully check wires and connections of all lights placed on the tree. Never plug in the tree lights unless someone will be home to keep an eye on the tree. Keep all gift wrapping and other flammable materials from direct contact with the tree. By following these simple steps, you can have a beautiful and safe holiday tree.

Potted poinsettia plants make an enjoyable addition to holiday decorations and have come to symbolize Christmas. The colorful parts collectively referred to as the flower are actually modified leaves called bracts. The yellow cluster in the middle is the actual flower. Poinsettias are referred to as long-night or short-day plants meaning that they need a certain amount darkness in order for flower initiation to begin.

Poinsettias are native to the Taxco region of Mexico, and were introduced to the United States in the 1800s by Joel Robert Poinsett, the first U.S. ambassador to Mexico. Prior to their Christmas-time use, the plant was cultivated by the native people of the area. Practical uses for the plant included dye made from the bracts and a medicine made from the milky latex sap. There are many cultivars of poinsettias including red, pink, white, gold, marbled, and variegated. To keep your poinsettia in good condition through the holidays you first need to cover the plant before exposing it to the cold, outside elements. Indoors, you need to keep the plant away from cold drafts and from heat sources such as your television, VCR, and vents.

Poinsettias like bright sunny areas, so place your poinsettia in a bright room. Don't let the soil dry out, but don't over-water it either. Poinsettias do not tolerate wet soil. Try to keep the soil evenly moist. Keep it out of the reach of small children and pets, and most of all, enjoy!

Other common holiday plants include:

Holly-one of the oldest plants associated with Christmas. Most hollies are evergreen, although there is a 'Deciduous Holly'. Male and female flowers are on separate plants, and both must be grown to obtain the red berries that persist all winter on the female plant. The berries of the holly are poisonous.

Mistletoe-a semi-parasitic plant. It manufactures its own food, but must obtain water and minerals from the host plant. Mistletoe grows in deciduous trees, and most of it sold during the holiday season is gathered from the wild in Oklahoma and Texas. The berries of the mistletoe are poisonous.

Christmas Cactus-at Christmas it produces two inch blossoms either from notches in the stems or from their tips. The flowers range in color from deep purple to pale salmon. Christmas cactus prefers rich, well-drained soil and partial shade or a window with bright, reflected light.

Amaryllis-a popular flower bulb often used as a gift plant. It is native to South Africa. The plant produces a bold stem that produces magnificent large, funnel-shaped blooms in colors of vivid red, orange, peppermint, salmon, pink, and white. With the wide selection of holiday plants, you are sure to find one you will enjoy.

Conference Report: Part 2 of 3: AgNIC

By Suzi Teghtmeyer

Evans Library of Fruit Science, SMSU

Dear Readers,

In the previous issue I described my experience in advocating on Capitol Hill as part of National Library Legislation Day on May 3rd and 4th of this year. Well, later that same week I traveled up the Beltway to the National Agricultural Library in Beltsville, Maryland, the meeting place of the annual AgNIC conference.

The AgNIC (Agriculture Network Information Center) Alliance is a collaborative alliance between librarians, cooperative extension agents, college and university agriculture departments, and others who unite around a common agricultural theme or sub-discipline. We use technology, primarily the Internet and e-mail, to knit disparate information resources into a cohesive whole. The results of these partnerships are rich collections of essential information and services offered to users around the globe. At annual meetings AgNIC partners discuss new developments in the world of technology and agriculture, showcase projects, present ideas and issues, evaluate past performances, and plan for the future of the partnership.

AgNIC members commit to building, maintaining and hosting a comprehensive website around an agricultural topic, and attend and participate in the annual, 2-day meeting. In 2001 I, representing the Paul Evans Library of Fruit Science, joined the alliance and maintain the AgNIC site on viticulture (grape culture). There are currently 41 AgNIC topic websites, including various livestock, bees and pollination, and Chile peppers, and more are under construction (AgNIC gardening should be up in 2005). Regarding fruit-related sites, Michigan State University maintains both cherries and cultivated blueberries; Washington State University maintains tree fruits; University of Wisconsin-Madison maintains American cranberries; and the Wild Blueberry Network Information Centre in Nova Scotia maintains wild blueberries.

This year's meeting began Thursday morning, May 6th, with an introduction and welcome by Peter Young, Director of the National Agricultural Library and great supporter of AgNIC and its mission. Reviews and discussions from various committees and board meetings were presented next. After a short break, we were updated on the status of our website portal that provides a central location and searching capability of the AgNIC sites.

That afternoon, our biggest discussion took place, weighing the pros and cons of establishing an alliance with the e-Extension initiative. The Cooperative Extension Service and land-grant universities have established e-Extension to aid extension personnel reach their target audience. In our discussion, AgNIC members examined how we could coordinate our resources and expertise with the needs of e-Extension, and what exactly our role in participating would be. After two and a half hours, we tabled the discussion and assembled into small groups to confer about other issues, such as sustainability, technology, and recruitment. I joined the mentoring discussion group where we addressed the needs of new members, how to set up a mentoring program, and the roles and responsibilities of mentors. Afterward, groups shared their outcomes with the full membership and I presented for the mentoring group.

By this time it was about 5pm, and business was halted for the day, and the reception began. We had agreed to bring 'a sample' of one's subject to the reception to share with our colleagues. Being May, I couldn't easily take Missouri-grown grapes, so I took the next best thing – Missouri wines! Back home I had purchased twelve bottles of Missouri wines, a small wheeled cart, then schleped them as carry-ons on the flight to Washington D.C. and onto Beltsville. I must say, I was warmly received at the reception! People were amazed and the variety and high quality of the wines (and port) they tasted. Other samples included beef jerky from Kansas State, honey sticks from Ohio State, and ornamental seeds from WinterSown Educational Organization in New York. Following the reception, we carpooled to a local restaurant, then retired to our hotels for the night.

First thing Friday morning, Judith Russell, the Superintendent of Documents at the Government Printing Office (GPO), shared how the GPO is providing more information electronically, thus the public can have greater access to the information our government generates. By going electronic, the GPO will save on costs incurred through printing, but now has to deal with Internet servers, file formats, copyright laws regarding digital information, and access of the public to the Internet. Next, I attended a hands-on session exploring the new portal design and the services it offers. After lunch, the membership resumed discussion regarding e-Extension, and concluded AgNIC would move toward a working collaboration with them to better serve our joint target audience. Other issues, including discussion topics and direction of the Executive Board, were discussed and concluded, and the meeting was officially adjourned in late afternoon.

Every year I am thankful that I'm a part of AgNIC. I have found people like myself, people who get excited compiling websites of information, then sharing the information with those who can benefit from it. In AgNIC, I can share my skills as a librarian, a compiler, an indexer, and website designer (read: too studious, a pack rat, a pigeon-holer, and techno-freak) with others who can benefit from my skills on a national, if not global, stage. I plan to continue with AgNIC, and I'm even considering adding a new topic site, possibly small fruits..... I'll keep you posted!

Websites mentioned:

AgNIC: www.AGNIC.org

e-Extension: <http://e-extensionproject.info/>

AgNIC Viticulture: <http://library.smsu.edu/paulevans/viticulture1.shtml>

New "Publications" Website

By Suzi Teghtmeyer

Evans Library of Fruit Science, SMSU

The Paul Evans Library of Fruit Science recently launched a new website for fruit growers and history buffs. The website is "Publications of the Missouri State Fruit Experiment Station." The site, which actually covers two pages due to its large size, lists all of the Bulletins, Circulars, Mimeograph Series (MS), Miscellaneous Publications, MP series, and Fruit News Notes that were published since the Station's inception in 1899. The effort has also been made to identify cultivars of fruits that are mentioned in the individual publications. This is handy if someone is looking for information regarding a particular variety to evaluate it for cultivation or breeding purposes. If a document has been reconfigured into an Internet-accessible format, a link to that document is provided. The documents can be seen in person by visiting Evans Library. I recommend you call ahead to make sure the library is open, at 417-926-4105. The website can be found linked from the Evans Library homepage and from the Missouri State Fruit Experiment Station homepage. The direct web address is: <http://library.smsu.edu/paulevans/FES/fespubs1.shtml>

Coming Events

Missouri Small Fruit and Vegetable Conference

February 21-23, 2005

Clarion Inn and Convention Center
Springfield, Missouri

For more information contact:

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