



The Berry Basket

Newsletter for Missouri Small Fruit and Vegetable Growers

Volume 4 Number 4

Winter, 2001/2

Contents:

Water: Too Little or Too Much	1
Blues News	4
The 2001 Strawberry Season	5
Why Choose Ornamental Grass?	7
Petunia: New Look for an Old Favorite ...	8
Linking MO Producers to Restaurants ...	10
Skinny Peach Trees	10
Spring Sown Vegetable & Flower Crops .	12
Vegetable Crops	13
An Autumn Olive a Day	14
Two Favorite Gardening Books	16
Small Fruit and Vegetable Conference	16
Spring Horticulture Conference	17

From the Editors

by Marilyn Odneal

It is our pleasure to introduce two new regular contributors to our newsletter; **Jennifer Barnes**, NE Region Horticulture Specialist - Outreach and Extension at Kirksville and **Dr. David Trinklein**, Professor of Horticulture at UM-Columbia. Welcome aboard! Thanks also to **Teresa Hoy** for updating us on the Harvest Connection Program in this issue.

Please note the upcoming Missouri Small Fruit and Vegetable Conference and the Missouri Spring Horticulture Conference. We hope to see you!

Berry Basket Newsletter Staff:

Patrick Byers, Gaylord Moore and Marilyn Odneal - eds.
Pamela Mayer - proofing, copying and mailing list.
Teresa Inman - posting and sending.

Please direct comments to:

Marilyn Odneal, SMSU - Mountain Grove, 9740 Red
Spring Road, Mountain Grove, MO 65711
phone: 417-926-4105, fax: 417-926-7421
e-mail: mbo774t@smsu.edu

Internet: <http://mtngrv.smsu.edu>

Water: Too Little or Too Much by Ben Fuqua

Water is a rather simple chemical compound, but its role in blueberry production is far from simple. Providing adequate but not excessive amounts of water is essential for producing high yields of quality blueberries in Missouri. The physical and chemical characteristics of Missouri's mineral soils, coupled with the unique root system of highbush blueberries, makes water management quite a challenge. The root system of highbush blueberry plants is composed primarily of fine, fibrous roots lacking in root hairs, which greatly limits the growth and production of blueberry plants in both excessively dry and extremely wet soil conditions. Since blueberry roots in Missouri actively grow for approximately nine months of the year, it is imperative that soil water levels be maintained at the optimum moisture conditions during the critical times of fruit development, berry production, and fruit bud initiation.

Soil Water: Water and air are stored in voids or openings (pores) that form between mineral and organic matter particles. The size, shape, and distribution of these pores determine the amount of water that a specific soil can hold. All water in these pores, however, is not usable by blueberry plants. "Available water" is the term that describes water stored in the soil that is readily available and easily usable by plants. Maintaining soil moisture levels within the range of "available" water provides adequate amounts of water for plant roots to use for growth and production. "Excess" water is held in small (micro) soil pores and drains very slowly, if at all, from the soil. This water is not

usable by blueberry plants as the excess soil moisture excludes oxygen from the plant root zone, restricting the absorption of water and nutrients that are critically needed for other essential metabolic reactions. The lack of oxygen in these soils commonly results in poor (if any) plant growth or yield, and in some cases may cause death of the entire plant. The third type of water in the soil's pore space is water attached to clays, silts, sands, and other soil solids. This "Unavailable" water is held so tightly by the soil particles that plant roots cannot remove it. This situation generally occurs during dry summer months when natural rainfall or irrigation has failed to provide sufficient soil moisture. When this occurs, blueberry plants wilt, drop fruit and leaves, and eventually die unless supplemental water is supplied.

Available Water: "Available" water is defined by the tension or tightness with which water is held in the pore space. Available water implies that the plant root can absorb and utilize water from the pore space for growth, production, and other metabolic functions. While the actual soil water content (%) may vary from soil to soil and from one geographical area to another, "available" water can be readily absorbed from any soil for utilization by plant roots.

Let's look at a three examples in which water management schemes must be changed in order to provide "available" water to highbush blueberry roots.

Example 1: Coarse-textured, sandy soils will have a high proportion of large sized (macro) pores. While these large pores hold greater quantities of water, most of the water will drain quickly from the soil, leaving little water around the plant root. In these soils, water may be sufficient for part of the year, usually during early spring and late fall, when plant growth is minimal and natural rainfall normally provides adequate moisture for plants. However, during the remaining months that involves berry formation, development, and ripening, these

well-drained soils cannot provide enough water. Soils, even in this extremely dry condition, still contain a small amount of water in the pore space, but it is "unavailable" to the blueberry roots. Therefore, in this situation an irrigation or other watering system will be needed to supply the plants with usable, "available" water. Although these soils have the advantage of being well-drained, the lack of water storage capacity represents a major drawback in blueberry production. Soils of this type require very frequent irrigations to sustain an adequate soil moisture level for plant growth and production.

Example 2: Clay soils, on the other hand, consist of minute mineral particles that have a large number of small (micro) pores. These pores retain large quantities of water, are very poorly drained, and many times are referred to as "waterlogged" soils. The excess water in the soil excludes oxygen from the pore space, making the water unusable by blueberry roots. Growing good quality, high producing blueberry plants on this site becomes a huge challenge. Some sites can be sufficiently drained by reshaping the soil surface to direct excess water away from the plants or by installing internal or underground drains to help lower soil water contents. While both of these approaches can work in some sites, they are usually quite expensive to construct and maintain. Growers need to evaluate the cost effectiveness before implementing these drainage methods. It is often less costly to select another site with better drainage and other superior blueberry properties than to try to correct an undesirable site.

Example 3: The medium-textured soils, such as silts, silt loams, sandy loams, clay loams, etc., contain a better balance of macro- and micro-pores and therefore are more suitable for blueberry production. These soils tend to hold more "available" water for plant growth and production, but still contain adequate oxygen for proper plant growth. The soils, however, still require good water management during the year

since periods of excess moisture and moisture deficits frequently occur in Missouri during the same calendar year. Because of the uneven distribution of rainfall throughout the year, especially during the critical growth and production stages for blueberries, irrigation will be needed most every year in these soils as well.

Modifications for Improving Soil Water

Relations: A recent magazine article stated that good soil drainage and good water-holding capacity were two of the most critical factors in any successful blueberry planting. While mineral soils in Missouri don't exactly match the soil conditions of many of the major blueberry production states, certain cultural modifications have been implemented that allow Missouri growers to successfully produce high yields of large-sized, quality blueberries.

1. The water-holding capacity of most soils in Missouri can be improved by adding liberal amounts of organic matter into the planting row prior to setting the blueberry plants.

Decomposed sawdust, peat moss, greenmanure crops (high biomass crops such as sudan, rye, buckwheat, etc) can be incorporated into the soil to increase the organic matter content. Organic matter absorbs more water than minerals, yet the organic matter maintains a better balance between soil air and soil water. This results in a greater portion of soil water being "available" to plants. Powdered or pelletized sulfur, limestone, or other chemical compounds needed to adjust the soil pH to the proper range for blueberries can be incorporated into the soil along with the organic materials. One exception should be noted: Cattle manures should not be used as an organic matter source since the pH of manure is generally too high for blueberry production.

2. The continual maintenance of a 4- to 6-inch layer of sawdust, woodchips, or wood shavings on the soil surface as mulches also improves the water relationships around the plant roots. Since blueberry roots are predominately located in the mulch and upper few inches of soil, the water-holding capacity and the water/air balance will be greatly

improved.

3. Setting blueberry plants on raised beds or berms can improve drainage and soil water/air ratios in many blueberry sites. The 6- to 12-inch high ridge increases the depth of soil for the plant roots and allows excess water to quickly drain from around the plant root zone. This technique has proven successful in many soils of marginal depth and/or in soils containing a fragipan layer in the subsoil.

Irrigation Scheduling: Several excellent techniques are available to help growers determine when and how much to irrigate blueberry plants. The "feel" and the "checkbook" are very low cost methods that are easy to use and (with grower experience) give relatively accurate estimations of irrigation needs. Tensiometers and resistance-blocks are two accurate instruments for monitoring soil water status. These instruments measure soil moisture tensions, thus giving a more accurate measurement of the "available" water in the soil.

1. In the "feel" method, a sample of soil is squeezed in the palm of the hand and the moisture condition estimated from the appearance or "feel" of the soil. Soil samples that form a wet outline of a ball on the hand when the soil is squeezed or will stick to a bright, clean soil auger or trowel contains the "ideal" moisture content for blueberries. When the soil sample forms a ball that is somewhat plastic, only slightly sticks together when squeezed, and will not stick to bright, clean tools, the soil is too dry and irrigation is needed.

2. The "checkbook" accounting process compares daily water inputs (rainfall + irrigation) against plant water usage (evapotranspiration losses). The checkbook balance is started at 0 (usually after a soaking rain or a thorough irrigation). Water additions are added to the water input side of the ledger, while daily evapotranspiration losses are subtracted from the balance. When the balance reaches a negative 1-inch, irrigation should be applied. Supplemental water should be added via irrigation until the checkbook balance comes

back to 0. (Evapotranspiration rates for Missouri range from 0.17-0.23 inches/day for the months of July and August, and 0.10-0.15 for September and October. The higher values should be used for a clear, hot, sunny day while lower values should be used for cloudy, cool days.)

3. Tensiometers and resistance blocks are two of the most accurate instruments for monitoring soil water status. These instruments cost from \$50 to \$250 per acre, depending on the number of units used. Once tensiometers and resistance blocks are installed in the field, they are easy to use and require only minimal maintenance to obtain accurate soil moisture measurements.

Summary: A recent soil moisture report for Missouri stated that most soils in the state have been completely saturated by the unusually heavy rains received in December of last year. Most soils today contain excess water, which is causing muddy fields, roads, etc. The excess water could cause problems with early growth of plants next spring, especially if additional rain or snow is received. Blueberry plants are dormant at this time of the year and can tolerate the excess water. However, blueberry roots begin to grow when the soil temperature is above 43° F, which occurs in late February/early March for most of us. However, since most blueberry growers have chosen well-drained planting sites, have incorporated organic materials into the plant row, and have continued to use mulches and/or berms, I feel that most plantings are in good shape and should have few problems from the extra water. On the other hand, any water standing in a planting, particularly if near plant rows, should be removed as soon as possible to avoid plant injury.

Both too much water and too little water are detrimental to blueberry producers. Right now, we have too much water. The irony of this situation is that next summer, irrigation will still be needed!!

Blues News

by Jay Chism

Greetings from my new home in Columbia. As many of you may remember from my last article, Mindy and I have sold our farm and moved to Columbia where I will be in pursuit of my Masters of Science Degree in Horticulture from the University of Missouri.

As I sit here pondering all the changes my family has made in the last few months, I can't help but ask why some of you didn't talk me out of this crazy idea!?! (Just kidding.) I am confident that in the end, I will be happy with this decision I've made. At least that's what I keep telling my fifth grader, when he comes home complaining about his new role as the "new kid". Enough about me . . . Let's talk blueberries.



The Council members talk up Missouri blueberries with Mrs. Holden at the Governor's Conference.

Many of you are no doubt starting the winter chores of pruning and mulching your blueberry plantings. I hope all of you have kept the last week of February open for the Missouri Small Fruit and Vegetable Conference and the annual meeting of the Blueberry Council of Missouri. We will meet right after the Blueberry Session at 5:15 pm Tuesday, February 19. If you know any growers who are not part of the Council and would like to be, please pass the information on to them or let me know and I will contact them.

If there are items that you would like to have on the agenda for our 2002 meeting, please let one of the officers know or you may contact the Fruit Station at Mountain Grove and they will see that we get the information. Please keep in mind, that this is your organization. The group as a whole will only be as good as we as individuals make it. Some of the items I would like to discuss are: 1.) How do we tap into the Wine Tax for blueberry research? 2.) Should the Council make a little money on the blueberry bags it gets for growers? 3.) Election of Officers!

A big thank you to Earnie Bohner, Jean and Jim Klapmeyer, and Patrick Byers who joined me for the Annual Governors Conference at Tan-Tar-A. And an additional thank you to Patrick who volunteered to watch Earnie's and my plates while we went out to the van to get more sauce for the Klapmeyer's to serve the hungry crowd. Unfortunately for Earnie and me, Patrick's eyes weren't as sharp as we thought, and we lost all our food to an over-zealous server. Way to go, Patrick!! (*Editor's note: You both should have known by now never to trust Patrick with food.*)

Call me if you have any questions – (573) 449-6121. I'll see you at the conference!

The 2001 Strawberry Season *by Patrick Byers*

Missouri seldom has a "normal" strawberry season, and the 2001 season was no exception. During the fall I conducted an informal survey of strawberry growers in Missouri and Kansas to gather impressions of the 2001 season. Eleven growers responded to the survey, representing 25-30 acres of production.

First of all, the survey asked growers to describe their strawberry operations. Several common threads ran through the responses. Strawberry growers in Missouri and Kansas are primarily small scale, with operations ranging from 1/10 acre to 6 acres. Most growers have been in production for 10 years or less. Most

growers have diversified farms, producing a wide range of agronomic and horticultural crops. Vegetables, other small fruits, and tree fruits were mentioned several times by survey respondents.

The matted row production system was used by all survey respondents. One grower reported interest in annual plasticulture. The leading cultivar by far was 'Honeoye'; other important cultivars were 'Redchief', 'Earliglow', 'Allstar', and 'Jewel.' Several growers expressed interest in recently released cultivars such as 'Noreaster', 'Mesabi', 'Latestar', and 'Cavendish.'

The crop is mostly direct marketed to consumers as fresh fruit. All growers reported a good demand among consumers for locally produced strawberries. PYO is an important marketing outlet for many growers; the percentage of the crop sold PYO ranged from 0 to 100%. The remainder of the crop is sold prepicked, either at the farm or at an off-farm outlet such as a farmers' market. The 2001 price for PYO fruit averaged \$0.86/lb (the range was \$0.65-1.05/lb), while prepicked fruit sold for an average of \$2.18/lb (the range was \$0.95-3.50/lb).

When growers were asked to describe the 2001 season, the overall rating was poor to good. Several growers reported a lost crop. Specific problems noted in 2001 included the weather (wet conditions at harvest, hot temperatures at harvest, cold temperatures during the winter, hot and dry conditions during Fall 2000), poor plant survival overwinter, poor bloom and fruit set, small berry size, plant death during the 2001 growing season, weed problems, and problems specific to the cultivar 'Cardinal.'

The problems reported with the cultivar 'Cardinal' are similar to problems reported during the 2000 growing season. 'Cardinal' was developed at the University of Arkansas and has been a profitable cultivar for Missouri and Kansas growers. During the 2000 and 2001 fruiting seasons, however, several plantings of 'Cardinal' produced fruit that were soft, small,

and of poor quality, definitely not typical of the cultivar. A contact with Dr. Keith Streigler, fruit crops specialist with the University of Arkansas Extension Service, revealed the probable cause of this problem.

Tissue culture is a widely used method of plant propagation. Large quantities of plants are rapidly produced with this method, and the resulting nursery stock is free from insect and disease problems. Potential problems exist with tissue culture propagation, however. Certain fruit crops or cultivars may exhibit genetic instability when undergoing tissue culture, and the resulting nursery stock may show off type characteristics - chlorophyll deficiencies, nonrunning, changes in leaf size or shape, or changes in fruit characteristics. Evidence points to a problem with tissue culture propagation at a nursery that supplied 'Cardinal' plants to several other nurseries. A large quantity of these plants were then distributed to growers. Problems became evident during the 2000 harvest, and plantings that were kept for another year exhibited similar problems in 2001. These plantings should be discarded, as the plants will never perform as expected.

Another unusual problem noted in 2001 involved the death of plants during the growing season. Plants were submitted to the University of Missouri Plant Diagnostic Clinic, and several samples tested positive for the disease anthracnose. This disease attacks fruit, foliage, runners, and crowns and is favored by warm humid weather and rain. Anthracnose is probably introduced into new plantings on infected plants, and spores are dispersed by water splash. The disease overwinters on infected plant debris. Anthracnose is a serious problem in annual plasticulture, but seems to be increasingly a problem in matted row plantings.

The common form of anthracnose in Missouri is found on the fruit, with lesions that turn brown and eventually involve most of the fruit. Lesions may also girdle petioles and runners, causing leaves or daughter plants to die. Plants with anthracnose crown rot exhibit internal crown tissue that is firm and reddish. Plants

infected with crown rot may die, as was the case in 2001.

Management practices for anthracnose center around planting disease free nursery stock. Reputable nurseries go to great lengths to produce clean stock (tissue culture, isolated production fields, restriction of movement of equipment and personnel between infected fields and nursery fields). Nursery stock produced in colder areas typically has reduced anthracnose problems, but this strategy is becoming less effective as the range of anthracnose pathogens has extended. Unfortunately, anthracnose-infected nursery stock is difficult to detect.

The spread and severity of anthracnose in production fields may be reduced through cultural practices that reduce water splashing and keep foliage dry. Straw mulching (versus bare ground or plastic) and trickle irrigation (versus overhead sprinklers) are helpful. Do not use excessive amounts of nitrogen fertilizer, as plants grown in soils with high levels of nitrogen are much more susceptible to anthracnose. Rotate infected plantings out of strawberries for several seasons. Fungicide control of petiole or crown infections is not effective. Captan applied at 7-day intervals from bloom to harvest will give some control of fruit infections. Fruit rot is difficult to control if environmental conditions are favorable for disease development.

The weather is a perennial topic of discussion among strawberry growers, and the weather undoubtedly contributed to problems noted in 2001. Several growers felt that warm, dry conditions during late Summer-early Fall 2000 reduced the development of flower buds, resulting in fewer blossoms in Spring 2001. Other growers mentioned that plantings exhibited weak spring growth. The message here is clear – know your plants, and prevent any stresses that may adversely affect your crop. For example, irrigation can be critical in the late summer and fall during flower bud formation. Winter mulches may seem unnecessary during mild winters, but Missouri winters can be cold

enough to damage unmulched strawberries. Fall irrigation and winter mulches seemed to be particularly important during 2000-2001.

Growers also mentioned problems with rain during harvest. While we can't stop the rain, excess moisture is easier to manage with matted rows on raised beds. Straw mulch between rows will help reduce the spread of gray mold and anthracnose during wet periods, and also provides a surface to walk on after rains. Fungicide disease control can be a crop saver during wet seasons. Check labels for approved materials and proper timing of applications.

Missouri and Kansas growers recognize that every year presents challenges for strawberry production, but they are cautiously optimistic for the future of strawberry production. Most survey respondents plan to maintain the same acreage or slightly increase plantings. The dominant production system will remain the matted row, and growers seemed satisfied with the cultivars presently in production.

References

Maas, J.L. 1998. Compendium of Strawberry Diseases, Second Edition. APS Press, St. Paul, MN.

Midwest Small Fruit and Grape Pest Management Guide. 1997. Ohio State University Extension Bulletin 861. Available online at http://ohioline.osu.edu/b861/b861_15.html

Missouri Commercial Small Fruit and Grape Spray Guide. University of Missouri Extension Publication MX377. Available online at <http://www.hort.purdue.edu/hort/ext/sfg/default.html>

Pritts, M. and D. Handley (eds.). 1998. Strawberry Production Guide. Northeast Regional Agricultural Engineering Service Publication 88.



Ornamental grass lends texture to the winter garden.

Why Choose Ornamental Grass?

by Jennifer Barnes

Ornamental grasses are grass or grass-like plants that are used mainly for their beauty. Ornamental grasses first became popular in Germany during the mid-1930s. The driving force behind the popularity and use of ornamental grasses in the landscape was the German nurseryman, Karl Foerster. Foerster spent years collecting grass seeds and plants from America as well as from other parts of the world. Foerster observed his "discoveries" for many years in his perennial nurseries before introducing them to the trade.

With the recent resurgence in popularity, more and more varieties of ornamental grasses are becoming available each year. As a result, there is a grass suited for nearly every garden or landscape. The variety of size, shape, and color adds texture, motion, and grace to the home landscape. During the growing season, many species of ornamental grasses exhibit beautiful variegation and colorful foliage. Colors range from every shade of green and blue to bright reds and purple. The flowering heads (inflorescences) also provide many shades of color from summer to late fall.

Ornamental grasses also add a sense of movement and soft, soothing sound to the garden. Movement may be seen as waving or shimmering, or heard as rustling, whispering or sighing. The sounds often differ with the seasons.

Ornamental grasses require minimal maintenance and are relatively pest and disease free, thus limiting the need for chemical controls and fertilizers. Many grasses are drought tolerant. During cold winter months they provide food and shelter for wildlife.

For more information on ornamental grasses contact your Regional Extension Horticulture Specialist.

Petunia: New Look for an Old Favorite

by David Trinklein

Few other herbaceous ornamentals are as synonymous with gardening as is the petunia. A long-time favorite, the word “petunia” is associated with a plant that is available in a plethora of colors and is relatively user-friendly in the landscape. As the floricultural world searched for new species to adorn our gardens (and increase bedding plant sales), improvement of petunia as an ornamental plant took second place to more “glamorous” species. Recent work, however, has resulted in petunias the likes of which gardeners of yesteryear might not recognize because of improvements made in vigor and weather tolerance.

Petunia is a member of the Solanaceae (or nightshade) family. This is a family that contains some very sinister members such as deadly nightshade, angel’s trumpet and tobacco. In contrast, potato, tomato, pepper, and eggplant are all very valuable food crops which also belong to the nightshade family. The common garden petunia carries the scientific name of *Petunia x hybrida*, indicating it is hybrid in origin. In fact, common garden petunia is a result of crosses between *P. axillaris*, *P. inflata*, and *P. violaceae*, all wild species of petunia native to the more temperate regions of South America. The latter is significant in that it explains the reason why petunia, often classified as a semi-hardy annual, is not as happy in the heat and humidity of a typical Missouri summer as other species might be. This especially is true of the “older” cultivars that typically would go through a “summer swoon” at which time we trimmed them back severely to prepare them for renewed growth and bloom in the cooler fall months.

Traditionally, petunias are classified into one of two flowering types: grandiflora and multiflora. Grandiflora types are characterized as having large, heavily-ruffled, individually-ornate flowers; in certain cultivars, flowers can

approach five to six inches in diameter. Multiflora types have smaller, less ornate flowers, but more of them. Grandiflora types have the reputation of being “more showy”; multiflora types are thought to be more weather-tolerant (heat and rain) with more abundant blooms. Along the way, plant breeders developed double cultivars of each of these two types as well as a myriad of different flower colors and color patterns. A “break through” in petunia breeding came with the introduction of the Madness series in the 1970s. This series had flowers that approached the grandiflora types in size and ornate appearance yet had the weather tolerance and bloom number associated with multiflora types. The term “floribunda” was coined to describe this series to set it apart from other petunias on the market. The success of the Madness series was one factor which led to a renewed interest in petunia’s use in warmer regions of the United States and renewed attention given to petunia by plant breeders.

Although grandiflora, multiflora and floribunda petunias still enjoy a great deal of popularity, the gardening world is awash with new petunias, most of which are vegetatively propagated. The Supertunia series was probably the first of the vegetatively-propagated petunias to hit the market. Supertunias are a member of the Proven Winner collection of plants. They are very vigorous in growth habit with improved weather tolerance and abundance of blooms. Additionally, they are much heavier feeders than common, seed-propagated types. Other vegetatively propagated petunias in the Proven Winner collection include ‘Million Bells’ (or Calibrachoa hybrid) a very small-flowered petunia with reported incredible weather tolerance, and ‘Surfinia’, which probably is an improvement over the Supertunias in growth habit and ease of culture. All are either trademarked or plant patented by their developers. Rivaling the Proven Winner collection of plants is Ecke’s Flower Fields introductions. Petunias in this collection of plants include the small-flowered but profuse-blooming Liricashower and Colorbust series, the

vigorous, large-flowered Cascadia series (rivals the Supertunias in habit), and the double-flowered Doubleloon series and Marco Polo series. All are either trademarked or plant patented. Additional to the above are the outstanding new seed-propagated Wave and Tidal Wave series. Their spectacular spreading habit make them great choices for beds where a brilliant ground cover is desired. Unlike “regular” petunias, they continue to flower freely all summer without the need to trim them back. Tidal Wave exhibits excellent resistance to Botrytis, as well. A final new seed propagated series is the Morn series which is a miniature (or milliform) type of petunia. The series is characterized by compact plants with profusely borne small flowers and excellent weather tolerance.



1727. *Petunia nyctaginiflora* (X 3/4).

In the garden, petunias prefer full sun and perform well in a wide range of soil types. Best growth probably occurs in a well-drained, porous soil of medium fertility. A pH of between 6.0 and 6.5 along with high levels of phosphorous and potassium is ideal. Soil porosity is important to facilitate the development of a vigorous root system and to help prevent root rots. To test for porosity, dig a hole in your flower bed about 10 to 12 inches deep and fill it with water. The next day, fill the hole again and time to see how long it takes for

the water to drain. If the water drains within 8 to 10 hours, the porosity of your soil should be adequate for good growth. If the soil takes longer to drain, the incorporation of organic matter is recommended to help establish greater porosity.

Before planting petunias, maintenance levels of fertilizer should be applied to the bed. About two pounds per 100 square feet of a complete fertilizer such as 5-10-5 should be applied to the area to be planted. Make sure the fertilizer is well incorporated into the soil before planting. An additional top-dressing during the summer of nitrogen in the form of ammonium nitrate at the rate of about one pound per hundred square feet is desirable. Water in lightly after applying if rain is not forecast. This procedure might have to be repeated for the more vigorous and heavy-feeding vegetatively propagated petunias. Plant vigor is a good barometer to measure fertilizer need.

Once established, petunias need little care during the growing season. Dead-heading is not essential but does help to increase the attractive nature of the plants as well as to give increased flower production in certain cultivars. During hot, dry weather, supplemental irrigation to provide about one and one-half inches of water per week is suggested. If plants become excessively “leggy” and stop blooming, cutting them back to a few inches from their base can help rejuvenate the plants. At this time, a top-dressing of fertilizer should be applied at the rates given above. Petunias are considered to be relatively pest free with root rot diseases and Botrytis being the major troublesome diseases. Both are more problematic during wet weather or from over-watering.

If you have not tried petunias in your garden lately, you might be in for a pleasant surprise. Thanks to the efforts of plant breeders many new and improved forms of petunia are available to the gardening public.

Linking Missouri Producers to Restaurants

by *Teresa Hoy*

Harvest Connection, the program created to link Missouri producers with restaurants and other wholesale markets, had a successful first year. This program is a cooperative effort of the Missouri Department of Agriculture and University Outreach and Extension, through a grant from the USDA. Its success was due to Missouri's growing number of diverse farmers and the increasing interest of chefs. Restaurants receiving the weekly Harvest Connection fax had a variety of Missouri's finest products from which to choose. Producers offered everything from black cherries to persimmons to apples and peaches. Other foods marketed through the fax during the growing season were tomatoes (heirloom and other types); all varieties of herbs; shiitake mushrooms; goat cheese; several varieties of rice; pepper jellies and every type of vegetable imaginable, some common and others not so common. Meats that were marketed included buffalo burgers, elk roasts, beef, pork and lamb.

Twenty-two restaurants were the initial recipients of the fax beginning early Spring 2001. By late fall, that list had grown to thirty-three restaurants from the Kansas City area, Lake of the Ozarks and as far south as Joplin. Fifteen producers participated.

Harvest Connection plans to expand into the Springfield and surrounding area this year.

Anyone interested in receiving more information about this program, contact:

Teresa Hoy

Harvest Connection Project Coordinator
University Outreach and Extension

135 W. Market

Warrensburg, MO 64093

Ph: 660-747-3114

Toll Free: 877-684-0669

Fax: 660-747-9867

Email: hoyt@missouri.edu

Skinny Peach Trees

Imagine plucking sweet, juicy peaches from a tree that fits neatly in a tiny townhouse yard. That'll be a real possibility in a few years, when the progeny from Ralph Scorza's new peach trees go on sale at your local nursery. These unique, space-saving forms could have an important impact on the ornamental and home garden market, says Scorza, a horticulturist at [USDA-ARS](#)' Appalachian Fruit Research Station in Kearneysville, West Virginia.



Photo of Ralph Scorza by Ken Hammond, courtesy of USDA-ARS.

Commercial peach growers should reap even more benefit from his columnar—or 'pillar'—peach that maintains a diameter of about 5 feet, fully grown. The trees can be planted much closer together than conventional trees, which branch out to 16 feet across. That translates into many more peaches per acre, while land and production costs remain about the same.

According to one estimate, grower profits could increase by 20 to 50 percent.

“Many growers have hit the wall on maximizing peach production with conventional trees,” says Wanda Heuser Gale, an executive with International Plant Management in Lawrence, Michigan. “They can’t get production high enough to make it profitable. That’s why we’re so excited about this new peach.”

Another advantage of high-density planting: growers may get a profitable crop the second year after planting, when the pickings would be too slim in a conventional orchard to make harvesting worthwhile, says Scorza.

For growers who may not be ready for such a radical change, Scorza also bred an ‘upright’ tree that reaches 8 to 10 feet across. “We wanted to release two different forms to give growers a choice,” he says, noting that the cash outlay to buy so many columnar trees may be a stretch for some growers. Left unpruned, both new trees reach a height of 12 to 15 feet after several years.

Both columnar and upright forms are undergoing field evaluations at the West Virginia station and in eleven other states—from New York to Texas to Washington—plus three foreign countries. Greg Reighard, a professor of horticulture at Clemson University in South Carolina, is in his third year of evaluating pruning and training systems aimed at producing a ‘wall’ of fruit to increase efficiency.

“It’s their form and rapid growth that make these trees unique. We want to take these two traits and find a system that will maximize fruit production and minimize cost,” says Reighard. “They grow very quickly here in South Carolina, so you’re able to harvest a year earlier.” His second-year harvest produced between 12 and 25 pounds per tree from both tree forms. Because their forms are so different, ARS has filed a patent application on both. Scorza plans to involve commercial interests that will assess training methods from the growers’ standpoint and instruct nurseries on how to grow and market the trees.



Bountiful Harvest from skinny peach trees. Photo by Ken Hammond, courtesy of USDA-ARS.

Parents Make the Difference

Scorza says high-density orchards have revolutionized apple production worldwide. In the United States, per-acre apple production is about twice that of peaches. Unlike apples, however, there are no suitable rootstocks for dwarfing peach trees. So he looked for alternative solutions.

Around 12 years ago, while looking through the collection of a U.S. breeder, Scorza located a Japanese ornamental peach tree having a columnar shape but fruit too small to sink your teeth into. Later he found additional columnar tree germplasm. Through conventional breeding with commercial cultivars, Scorza produced both the columnar and upright tree forms and coaxed both forms to produce higher quality fruits that flesh out to 2.75 inches in diameter. Plus they are more productive than the parents.

The columnar form has two copies of the gene that sends the branches skyward, Scorza says, while the upright has only one copy. But both selections produce yellow-fleshed, dessert-type peaches with smooth, melting flesh that is sweet and aromatic. They are firm fleshed, store well, and soften when completely ripe.

—By [Judy McBride](#), Agricultural Research Service Information Staff.

This research is part of Plant, Microbial, and Insect Genetic Resources, Genomics, and Genetic Improvement, an ARS National Program (#301) described on the World Wide Web at <http://www.nps.ars.usda.gov>.

[Ralph Scorza](#) is at the USDA-ARS [Appalachian Fruit Research Station](#), 45 Wiltshire Rd., Kearneysville, WV 25430; phone (304) 725-3451, ext. 322, fax (304) 728-2340.

“Skinny Peach Trees” was published in the [December 2001](#) issue of *Agricultural Research* magazine.

Spring Sown Vegetable and Flower Crops

by *John Avery*

Spring will be here in about eight weeks and gardening time will be getting under way. Now is the time to think of the vegetables and flowers to plant for an early start. Hopefully, the various species/cultivars to plant have been decided and it is time to plan the early planting schedule. There are several items or factors that need to be considered and planned for to have a successful greenhouse crop and subsequently to produce a good garden.

First, you need to develop a seeding and planting date schedule. When you receive your seed from your supplier there is generally some basic information supplied on germination and growing the crop. Some of the information that may be stated or available is germination time, depth to sow the seeds, temperature for best germination and time from emergence to planting in the garden. Sometimes a drawing of the basic shape of the seedling is given to help with identification upon emergence. The time given

for emergence of seedlings to planting is generally for an average plant of a given crop, which will be ready for planting in the garden. The time for planting can be given in weeks from average last frost date for summer crops or sometimes the seeding date is given as weeks from first planting date for cool season crops such as lettuce or the cole crops. When dealing with flowers, the time given is to produce a crop with the first flower buds opening at sale or planting time. As stated these times are for average plants of the crop but sometimes there may be the desire to produce larger plants. When larger plants are needed then the seeding time needs to be backed up two to four weeks to produce the larger plant. Plans need to be made to give the plants a bigger cell or even a pot to grow in. Once the plant has formed a root ball in its cell or pot it will need to be planted in the garden within one or two weeks to keep it from stunting. This can be critical with crops like flowers or cabbage but may not be critical with crops like tomato.

Second, is planning the cell pack sizes for each crop you will be growing. The predominant tray in the bedding plant industry is the 1020, which measures 11 inches wide by 22 inches long. There are other sizes but this is the standard. The cell pack sheets that fit these trays come in a wide assortment of sizes and configurations. The crop to be grown determines the size and configuration of the cell pack to use. The determining factors are the length of time from seeding to planting and the size of the plant desired at planting. Some crops have long periods from seeding to planting of 8 to 12 weeks such as the petunia. The seed are very fine and the seedling is very small and grows slowly thus a relative long period is needed to produce a plant ready for the garden. Whereas some crops like pumpkin or squash have a large seed that germinates quickly, grows rapidly and should be planted within 3 or 4 weeks of seeding. The overall determining factor for cell pack size is: can the plant form a root ball in the cell by the time of planting so that the root system is not unduly stressed at transplanting? This is the

main consideration in producing the best plants for transplanting to the garden.

Third, is consideration of the media to use in production of the crop in the greenhouse. I do not recommend using compost or native soil, regardless to how good a sterilizer one may have. The microbes in a native soil can lead to undue disease problems that can cause heavy losses in a greenhouse setting. Always start with a good soil-less medium when starting seed in the greenhouse. The medium to use in germinating seeds is determined by the size of the seed planted. Very fine seed should be started on a medium that has been milled to a fine grade whereas large seed should be planted on courser medium. The finer the medium the more drainage problems that can arise, but for fine seed, good medium contact may not be possible with a courser medium, resulting in poor germination. Finer media can also wash more severely than the courser media so methods of wetting need to be considered thoroughly.

For most vegetable and flower species a neutral pH medium is needed but occasionally a low pH medium may be needed for some species. Most media have nutrients added in the manufacturing process and the pH adjusted to the neutral range with limestone. But there are media produced that have an acid pH for those species that do best in the low pH range. Selection of the proper medium for the crop grown is very important to the success of the crop in the greenhouse and later when transplanted to the garden.

The environment of the greenhouse will need to be adjusted for the crops produced. Some crops will need cool conditions while most will require warm conditions. As a general rule the early season crops such as cabbage, broccoli, cauliflower, or lettuce will do better when the greenhouse is kept cooler rather than warmer. Whereas, most of the summer crops, tomato, pepper, eggplant and most flowers, will do better when the temperature is kept higher. For these crops it may be desirable to use heating mats or coils under the trays during germination. Once the crop has emerged then the trays can be

moved off the heating mat to a regular bench for growth. Generally, the type of crop, that is early spring crop verses a summer crop, will determine the environment needed for best germination and subsequent growth in the greenhouse.

Another environmental factor for some crops is the need for light to hit the seed during the germination process. This is crucial for lettuce and some of the flower crops. Thus the seed must be sown on top of the medium and not buried as with most other crops. The seed must have good contact with the medium and moisture while remaining exposed to light. It is best to wet the medium in the trays before seeding the crop and then place the trays under a fog or mist system until germination occurs. Alternately, some grower put glass or Plexiglas panes over the trays to hold in moisture and still allow light to the seed until germination occurs. Seedling emergence must be checked daily so the pane can be removed as soon as cotyledons are seen.

The steps to successful production of plants for the garden whether for sale or your use is proper planning of a production schedule, the selection of the correct cell pack size, and the proper media to use for each crop. In addition the management of the greenhouse environment is needed for the best growth of plants.

Vegetable Crops

by Gaylord Moore

Successful vegetable production on the commercial scale depends on many variables. Proper nutrition, suitable soils, supplemental water when needed and sound marketing techniques are only a few of the requirements for success. However two other requirements are a must when planning for a sound vegetable program. Proper variety and pest control selections are at the top of the list.

Vegetable crop varieties are on every page of vegetable seed catalogs. The pictures representing the varieties are outstanding and

variety descriptions are helpful in making your selection. However, will they perform on your farm as advertised? Needless to say, not all varieties are alike. Each are developed and designed to perform for a specific reason and all have unique characteristics. Growers must make the decision whether the variety has potential for them or if it will fit a niche situation. New varieties selected for your farm should be tried for the first time on limited basis. Afterward, decisions can be made whether to continue with the varieties or eliminate them from future use. For your main crop always use varieties that have been successful for you in the past.

The seed catalogs are good sources to help you make quality decisions as what to plant. They give descriptions as to variety characteristics that are very important. However, variety trial reports are extremely important tools to help make proper selections. Varieties are compared and examined for performance and specific plant characteristics. As a reminder, data is most valuable when replicated more than one year. Variety trials performed within your geographical area are generally more valuable to you than outside your region. However, having the luxury of a variety trial within your backyard is not always possible. So for best selection results, choose trial areas that are typical to your farm as to soils, temperatures (heat and cold), and growing season. The **Midwestern Vegetable Variety Trial Report for 2001** is now available for \$10 from University of Missouri publications through the University of Missouri Extension Centers. This report will greatly assist you with vegetable varieties to plant in your operation.

Pest control is always a priority for a successful vegetable grower operation. Whether it is insects, diseases or weeds, control can be the difference between success and failure. Growers must keep up to date with changes for pest control. New chemicals are being developed and introduced yearly that may have specific merit for commercial use. Periodically, due to various reasons chemicals are removed

from the selected list. If you are a commercial grower depending upon pesticides as part of your arsenal against pests, you must purchase the **Midwest Vegetable Production Guide for Commercial Growers 2002**. In addition to the pesticide recommendations, other important and timely information is included in the commercial production guide. For seven dollars, the price of the publication, the grower can have fingertip convenience to assist with important management decisions. This publication is available through your University of Missouri Extension Centers. Publication number is FMX – 384.

An Autumn Olive a Day Keeps the Doctor Away! *by Patrick Byers*

To say that the Americans today are health conscious is an understatement. The concern certainly extends to the foods that we eat. Substances found in fruits and vegetables, such as antioxidants and vitamins, have demonstrated health benefits. Those foods that contain high levels of these substances may hold promise in controlling health problems such as cancers and heart disease.

One such substance, lycopene, a carotenoid found in several orange and red fruits and vegetables, is widely believed to protect against heart disease and various forms of cancer, including prostate cancer. Tomatoes and tomato products have received a lot of press recently as a good source of lycopene. Researchers at the USDA/ARS National Laboratory in Beltsville, Maryland, recently reported in the journal *HortScience* that the fruit of the Autumn Olive (*Elaeagnus umbellata*) may offer much higher levels of lycopene.

The autumn olive is a native of China, Japan, and Korea. Imported into the US in 1830, the plant has been widely promoted by state and federal agencies as a wildlife food source, as screens along highways, to stabilize road banks,

and to reclaim mine spoil. The plant is a medium to large shrub, sometimes reaching 20 feet in height. Leaves are grayish green on top and silvery white below. The small light yellow flowers are borne in late April and May, and fruit ripen in late summer to fall. The fruit are small, usually pink to red (yellow fruited plants are known), juicy, and borne in abundance each year. Autumn olives are naturalized throughout Missouri.



Autumn olive. Source: Conservation Trees and Shrubs for Missouri, Copyright 1983 by the Conservation Commission of the State of Missouri, Revised 1989, Art by Dale Larison.

The autumn olive has several characteristics of note. The plant fixes nitrogen, and grows quite well in sites with poor or disturbed soils. Plants begin to bear fruit when young (2-3 years), and a mature bush will produce up to 8 pounds of fruit. Once established, the bushes are persistent and can become highly invasive. Birds and mammals spread seeds, and seedling plants are difficult to eradicate once established.

In fact, a recent search of the Web revealed that most autumn olive sites were focused on control measures for this species.

The fruit of autumn olive is rarely harvested in the US, but widely eaten in Asia. Uses include preserves, condiments, fruit rolls, juice, flavoring, wine, and other food products.

The study reported in HortScience evaluated the lycopene content of berries of several autumn olive cultivars and naturalized plants. The lycopene content of berries from the cultivars ranged from 15-40 mg per 100 g of fresh fruit, while naturalized berries contained 18-48 mg per 100 g of fresh fruit. Interestingly, a yellow fruited autumn olive only contained 0.47 mg of lycopene per 100 g of fresh fruit. For comparison, fresh tomatoes contain 3 mg per 100 grams of fruit, and tomato paste contains 29 mg per 100 grams. While more research is indicated by these results, the high lycopene content of autumn olive is notable. For more information, consult the references below.

Autumn olive. http://www.ppws/vt.edu/scott/weed_id/elgum.htm.

Fordham, I.M., B.A. Clevidence, E.R. Wiley, and R.H. Zimmerman. 2001. Fruit of autumn olive: a rich source of lycopene. HortScience 36(6):1136-1137.

Vegetation Management Guideline-Autumn Olive. <http://www.conservation.state.mo.us/nathis/exotic/vegman/four.htm>.

Editor's note: Stark Bros. Nursery has been purchased and has reopened for business in Louisiana, Missouri.

Two Favorite Gardening Books

by *Suzi Teghtmeyer*

We're half-way through winter, but there's plenty of time to curl up with a good book. I decided to profile two favorites of mine, an old and a new.

The older book is *Sleeping with a Sunflower: A Treasury of Old-time Gardening Lore*, by Louise Riotte [Pownal, VT: Storey Communications, 1987]. After the introduction the book is divided into twelve monthly chapters, peppered with illustrations and insets describing odd facts. Each chapter contains garden wisdom, legends pertaining to crops, and insect and disease prevention tips. Attention is paid to the moon phases, zodiac signs, Native American wisdom, and the influence of other cultures on growing and preserving fruits, nuts and vegetables. The book offers unique recipes, for instance flower wines, piccalilli, gooseberry fool, Indian pudding, and blackberry cordial. Throughout the work are snippets and articles, ranging from natural dyes, to dandelion coffee, to weather predictors, to historical items such "Sundials in Colonial Gardens". In conclusion, this is an easy book to just pick up and read when you have a minute here or there, and you will come away with a new perspective on how your garden grows.

This work, *Cultivating Delight: A Natural History of My Garden* by Diane Ackerman [New York: HarperCollins, 2001], has quickly jumped up my charts to star as a new favorite. An accomplished essayist and naturalist, Ms. Ackerman has published many other works including *A Natural History of the Senses*. *Cultivating Delight* is a contemplative, first-person look at a contemporary life influenced by gardening. There is neither a table of contents nor an index, but the book has an addendum of plants in Ms. Ackerman's various garden areas, along with their scientific names and light requirements. The narrative extols many subjects like weather phenomena, insect life, the

garden's numerous impacts on the senses, and her garden's seasonal evolution. This would be a pleasant gift on Valentine's Day, as the prose is poetic, the images are vivid, and tone is contemplative, as reflected in the following passage. "One day in the depths of winter, I try to remember the sense-drenching smell of Abraham Darby, one of my all-time favorite roses. What was it exactly? Candied lemon peel, apple, cinnamon, and chocolate, as I recall. Fruitier than the flower called Paradise, not as earthy as Purple Tiger, less lemony than Intrigue, sweeter than Playboy. Smells are hard to capture in words, especially ones as complex as the individual scent cloud of a rose.", p. 223-224. Literary, historical and personal characters are also woven into her contemplations. I found the book a delightful escape, her words evoking vibrant images as I daydream of the springtime to come. I hope you too will find this work an enjoyable read, that will enlighten you to the many wonders of your own resplendent, natural Eden.

2002 Missouri Small Fruit and Vegetable Conference

by *Patrick Byers*

The 2002 Missouri Small Fruit and Vegetable Conference will be held on February 18, 19, and 20 at the Clarion Inn and Conference Center, Springfield, Missouri. The Conference brings together small fruit and vegetable growers, researchers, extension workers, and commercial suppliers from across the state and around the country.

A small fruit/vegetable bus tour on the first day of the conference, February 18, will visit several farms in southwest Missouri. The farm of **Wayne and Mary Lou Roffman**, near Carthage, will be featured. The Roffmans have a diverse farm operation with cattle, row crops, vegetables and strawberries. They have 60 acres

in vegetables plus two acres of strawberries. The horticulture aspect of the operation consists of a very diverse selection of warm and cool season vegetables. All of their marketing is retail with on-the-farm sales, farmers markets and roadside sales. The Roffman's are quite innovative with production equipment and transport of produce from the farm to sales areas. We will also visit the farm of **Chad and Tracy Keutzer**. Chad and Tracy produce strawberries, blackberries, pumpkins, and fun experiences at their farm near Jasper. Their latest adventure was a fall corn maze that delighted hundreds of visitors. Fruits and vegetables are marketed through a fruit stand at the farm, both PYO and pre-picked, and through wholesale channels.

The conference continues on Tuesday, February 19, with keynote speaker **Sue Rourk King** (FSA-Kansas City), who will share insights into the relationship between small farmers and the government. The general session follows, with presentations on native cover crops, making connections between growers and chefs, and making the most of your money. The alternative crops session follows, with presentations covering chestnut production, table grapes, and raspberry fertility management. The blueberry session, with discussions on nitrogen use and commercial blueberry production, rounds out Tuesday.

The final day of the conference, Wednesday, February 20, begins with the strawberry session. Topics range from conventional to organic strawberry production, the highlights of the 2001 season, and a grower's experiences with commercial production this session. The vegetable session, new for 2002, includes talks on pumpkins, tomatoes, and season extenders.

Speakers at the 2002 conference include **Dr. Gail Nonnecke**, a respected small fruit researcher from Iowa State University, and **Dr. Eric Hanson**, small fruit extension specialist from Michigan State University. Vegetable production is a new feature of the conference this year, and we are excited to have **Dr. Chuck Marr**, vegetable specialist from Kansas State University, and **Dr. Lewis Jett**, state vegetable

crops specialist at the University of Missouri, to share their expertise. We are also pleased to have five growers on the schedule.

For information on the conference schedule and registration information, contact us at SMSU State Fruit Experiment Station, 9740 Red Spring Road, Mountain Grove, MO, telephone 417.926.4105, or email plb711t@smsu.edu for conference details, or see the website at: <http://mtngrv.smsu.edu/calendar.htm>.

2002 Missouri Spring Horticulture Conference

by *Marilyn Odneal*

The Missouri Spring Horticulture Conference will be held on **Saturday, April 6, 2002** at the State Fruit Experiment Station of SMSU in **Mountain Grove**. The conference is a combined effort of the University of Missouri Cooperative Extension Service and the Southwest Missouri State University Fruit Experiment Station. The Tri-County Master Gardeners will be assisting with the conference this year. Although the schedule has not yet been finalized, suggested topics include lawn care, berries, plant propagation, pruning, home greenhouse production, water gardening, wildflowers, nut production and maybe even model train-scaping! The conference lasts most of the day (specific times are not yet finalized). Topics are offered concurrently throughout the day. Pre-registration is required since the attendance is limited to 110. The \$10 per person registration fee includes both the conference and lunch.

For further information please contact:

Pamela Mayer
SMSU-Mountain Grove
9740 Red Spring Road
Mountain Grove, Missouri 65711
417-926-4105
pam621t@smsu.edu

You can also check our news and events website at <http://mtngrv.smsu.edu/calendar.htm> for the forthcoming schedule and registration form.

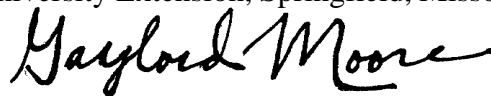
**COOPERATIVE EXTENSION SERVICE
U.S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MISSOURI
CLARK HALL
COLUMBIA, MO 65211**

PRSRT STD
POSTAGE & FEES PAID
EXTENSION SERVICE
PERMIT NO. G-268

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

Your editors of The Berry Basket:

Gaylord Moore, Area Horticulture Specialist,
University Extension, Springfield, Missouri.



Patrick Byers, Fruit Grower Advisor, and
Marilyn Odneal, Research Associate,
Fruit Science, State Fruit Experiment Station,
SMSU, Mountain Grove, Missouri Missouri.



Send address changes and comments to:
Dept. of Fruit Science, 9740 Red Spring Road,
Mtn. Grove, MO 65711 or mbo774t@smsu.edu.
