



High on the Desert Cochise County Master Gardener Newsletter

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The University of Arizona and U.S. Department of Agriculture Cooperating

The Virtual Gardener—Square Foot Gardening

Several years ago I wrote a tongue-in-cheek article for the Master Gardener Newsletter about the discovery of a fictional hormone called *geotrophin* that caused humans to develop an irresistible desire to dig in the soil and frequent garden shops about this time of the year. (Note: *Geotrophin* is reprinted on Page 3 of this newsletter.) Although the hormone was fictional, there does seem to be something in the spring air that powerfully motivates gardeners to get out of the house and into their gardens. This month I want to reinforce that urge by discussing a gardening system called Square Foot Gardening.

The system was developed more than 20 years ago by Mel Bartholomew, a retired engineer and described in his book, *Square Foot Gardening* (Rodale Press, 1981). Like a good engineer, Bartholomew decided to systematically examine the process of vegetable gardening to discover the most efficient and effective ways of producing backyard crops. (BTW, although Square Foot Gardening originally

focused on vegetable gardening, the principles apply equally to flowers and herbs.) His intent was to get the biggest return for the gardener's investment in time, money, and other resources. The result was a set of "engineering" standards for creating a garden—a kind of combination blueprint and operator's manual. Bartholomew's system is based on four fundamental principles.

The first principle—as evidenced by the name, Square Foot Gardening—concerns the geometry of the garden. A square 12 inches on a side is the smallest element of the system. The 12 inch squares are grouped into multiples of sixteen, which form a block 4 feet on a side, the basic unit of the garden. Of course, the blocks can be smaller (e.g., 2 feet by 2 feet) if space is a problem and longer if desired, but they should never be wider than 4 feet. This size was selected because it allows an easy reach (2 feet or less) to any plant within the unit. If more than one block is used, they are separated by a

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Cochise County Cooperative Extension

www.ag.arizona.edu/cochise/mg/

1140 N. Colombo, Sierra Vista, AZ 85635

(520) 458-8278, Ext. 2141

450 Haskell, Willcox, AZ 85643

(520) 384-3594



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minimum of 24 inches to allow easy access to all blocks in the garden.

The second principle concerns the placement of plants within the four-foot blocks. The 12-inch squares are the basis for planting. Depending upon the spacing requirements for the plants, a square may contain from 16 (3 inch spacing) plants—*e.g.*, carrots or shallots—to ¼ of a plant (24 inch spacing)—*e.g.*, tomatoes. When planting seeds, Bartholomew advocates a maximum of two or three seeds per hole. This allows for enough redundancy to assure at least one plant sprouts but does not produce so many plants that large numbers need to be destroyed by thinning.

The third principle is having the correct soil. All of us who attempt to garden in the High Desert are used to working with poor soils that may be too alkaline, too sodic, too sandy, or too clayey or any combination of the above. Bartholomew's solution to soil problems is to blend your own "soil" and fill your blocks with it to a depth of up to 16 inches. His ideal blend is one-third each by volume of compost, peat moss, and vermiculite.

The fourth principle is applying the correct amount of water. Again, we who live in a water-

starved environment are (or should be) acutely aware of the requirement to use just the right amount of water in our gardens. Too much is a waste, and not enough is a disaster. Bartholomew's solution is to hand water each plant with a cup or watering can. The gardener is the ultimate "smart" irrigation controller. Of course with a traditional garden spread out over a large area, hand watering would be impractical, but with the high intensity square foot method it is easily doable.

My few words in this article are not intended to give you all the information you need to start a square foot garden but rather to inspire you to look into this technique a little further. If you do a Google search on "square foot gardening" you will turn up thousands of hits. Of these, arguably the best is Mel Bartholomew's site at <http://www.squarefootgardening.com/>. Although one of the purposes of the site is to promote Bartholomew's books and other products, there is also lots of other interesting and useful information there. If you would like to read the book, check out the Cochise County library system which has two copies of the newest (2006) edition and six copies of the older (1981) edition.

Other Web sites worth looking into are:

http://journeytoforever.org/garden_sqft.html, a how-to site and the square foot gardening forums on the Garden Web at:

<http://forums.gardenweb.com/forums/sqfoot/>

Until next time...Happy Surfing.

Gary A. Gruenhagen, Master Gardener
gruenha@theriver.com

Mismatched Plants

Just as some plant combinations make good neighbors, others don't get along. Invasive plants must be separated from plants they will overtake, while other plant enemies compete for the same nutrients, or attract the same pests, providing an easy target for bugs. Some plants release substances into the soil that can inhibit other plants. So, if you are having problems with a plant, watch the plant growing next door as it may be the problem. Here are some mismatched plants:

Beans: Keep away from onions, garlic, shallots and leeks.

Beets: Plant away from pole beans and mustards.

Broccoli: Avoid planting close to strawberries and sunflowers.

Cabbage: This group doesn't mix well with strawberries, sunflowers, and grapes.

Carrots: Keep away from dill.

Corn: Don't plant too close to tomatoes and sunflowers.

Eggplant: Keep away from potatoes, tomatoes, and peppers.

Garlic: Avoid planting near beans and peas.

Lettuce: Avoid the cabbage family and sunflowers.

Onions: Do not plant near beans and peas.

Peas: Keep away from onions, garlic, shallots, and leeks.

Peppers: They don't mix well with eggplant, tomatoes, potatoes, and fennel.

Strawberries: Keep away from the cabbage family.

Tomatoes: They don't get along with corn, potatoes, peppers, and eggplant.

Source: *Sunset Magazine*, March 1999

Cuttings 'N' Clippings

* The next CCMGA meeting is 5:00 p.m. Thursday, April 5, 2007 at the University of Arizona South campus, Room 508. Jan Groth will speak on getting spring color in the landscape.

April is

"Water Awareness Month!"

* The April *Water Wise* lecture will be held Saturday, April 7 from 9:00—11:30 a.m. at the University of Arizona South Campus. Cado Daily and Cyndi Wilkins with the Water Wise Program will talk about the basics of drip irrigation. Penny Artio, Grounds Supervisor at UAS, will show the different parts of a drip irrigation system and how to schedule a simple irrigation controller in a workshop called *Hands-On Drip with Problem Solver Penny.* For information contact Cado Daily at 458-8278, Ext. 2139 or check the web site: www.ag.arizona.edu/cochise/waterwise

* The next Sierra Vista Farmers market day is Thursday, April 5 from noon to 4:00 p.m. at the corner of Wilcox and Carmichael. The 2nd Annual Earth Day will be celebrated at the Sierra Vista Farmers Market with a special market on Saturday, April 21 from 9 a.m. to 1 p.m. as part of the West End Block Party. For more information e-mail vallimac@cox.net or call 266-1976.

* Three Pima County Master Gardener home gardens in Tucson, as well as the Pima County Cooperative Extension

Center garden, will be on display on April 14 from 9:00 a.m. to 3:00 p.m. For information call (520) 626-5161—there is a fee.

* On Sunday, May 6 from 1:00 to 4:00 p.m. *Water Wise* and the Cochise County Master Gardeners will once again sponsor a Xeriscape (Low Water Landscape) garden tour. Docents will be at each yard to answer questions and plant lists will be available. Be sure to bring a camera! Remember, this is a FREE tour! Maps of the beautiful and creative landscapes will be available from the Sierra Vista Cooperative Extension Office mid-April. Contact the office at 458-8278, Ext. 2141 for information or to request a map.

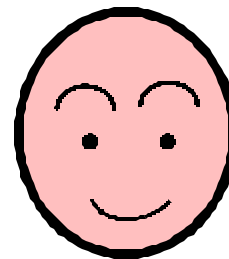
* The Sierra Vista Gardeners' Club will be holding its annual Spring Plant Sale on Saturday, May 12 from 8 a.m. to noon at the Bisbee Farmer's Market in Vista Park. The club will have available annual flowers, perennials, herbs, vegetables, houseplants, and cacti. A selection of Mother's Day gift plants will be available for purchase as well as baskets and vases. Many seeds will be available for a donation.



Robert E. Call

Robert E. Call
Extension Agent, Horticulture

Carolyn Gruenhagen
Editor



Geotrophin— A New Hormone

Australian researchers at the University of Woomera have announced the discovery of a previously unknown behavior-modifying human hormone called *geotrophin*. The hormone is produced in the hypothalamus in a complex response to changing circadian rhythms, photo periods, and accumulating heat units. Although *geotrophin* is produced in all adult humans, the quantity appears to be genetically controlled. Only about 20 percent of the population exhibits a *geotrophin* deficiency.

An increased blood serum level of *geotrophin* manifests itself in an uncontrollable desire to dig in the ground, rake the soil, scatter plant seeds, and apply water to the soil, especially on late spring weekends. In addition, there may be a strong attraction to plant nurseries and garden shops. Although these behaviors may persist for a few weeks, *geotrophin* levels usually fall off quickly as the days lengthen and heat units continue to accumulate.

Gary A. Gruenhagen, Master Gardener

The Tombstone Rose

**'Lady Banks Rose'—
*Rosa banksiae***



The Tombstone rose is a climber with tiny white or yellow colored blossoms. It grows very vast and can form a dense canopy. New growth is delicate and dainty in appearance, but in actuality it is very hardy and adapts to new environments readily. A substantial support system should be planned or yearly pruning will be necessary to hold the plant in check. The Tombstone rose grows extremely well here and should be in bloom between the middle of March to the middle of April.

If you have yet to visit the museum in Tombstone where this rose is established, you will be in for a pleasant experience. This rose plant is listed in the *Guinness Book of Records* as the largest in the world. It is over 100 years old and the base is as large as a river tree. When you visit the museum to view the rose you enter a backyard and you will be under an umbrella of roses. The extent of growth and the support required to hold up the developed plant will surprise you. The fragrance and cocoon-like atmosphere will charm you. The spent blossoms fall to the earth to create a snowpack of soft petals. There are two other fairly large specimens of the rose in Tombstone; one at the Catholic Church and the other at a private residence near the courthouse.

It takes no special conditions to grow this beauty. It does like the sun so plan a site where it

receives plenty. Placement in a shady location may create conditions for powdery mildew or encouragement of thrips.

The Tombstone rose is propagated by cuttings and transplants easily. This plant is recommended as a living roof of roses on a patio. It also lends itself well to arched trellises or if planted against the house, produces a wall with shadows of delicate beauty.

The Tombstone rose will please you with its easy adaptability to various environments. It is very fast growing and offers a multitude of blossoms in the spring. The lacy new growth is pliable and eager to create the effect you desire when landscaping.

Barbara Kishbaugh, former Tombstone resident and Cochise County Master Gardener (Reprinted from the April 1993 Cochise County Master Gardener Newsletter)

University of Arizona Improved Planting Standards

1. Loosen the soil three to five times the diameter of the root ball and no deeper. Dig the planting hole to accommodate the root ball. The sides of the hole should be rough or sloping. Trees develop a root system that extends one and a half to four times the canopy diameter and lies within two to

three feet of the soil surface. This lateral root system supports the tree and absorbs water and nutrients. Transplanting practices should encourage root spread.

2. Set the top of the root ball at or slightly above the soil surface. Trees planted in holes deeper than the root ball tend to subside as irrigation compacts the soil beneath the root ball.

3. Remove the tree from the container. Lift the tree by its trunk. Disentangle and spread any roots that had circled in the container. Score the sides of the root ball to encourage lateral root growth.

4. Place the tree in the hole and backfill. Do not add amendments to the soil. Do not tamp with your feet. Form irrigation borders (if used) just outside the root ball. Amended backfills tend to restrict root spread and reduce top growth. Amended backfills also tend to wick water away from the root ball.

5. Spread mulch on the soil surface to a depth of three to four inches. Keep mulch away from the tree trunk.

6. Do not prune unnecessarily. Root initiation and growth is stimulated by stem buds and leaves, therefore shoot pruning reduces root growth and prolongs establishment. Leave shoots on the lower trunk for two to three years. Remove them during years four and five.

(The University of Arizona Plant Sciences Department released these new recommended Planting Standards to improve the viability of new trees when transplanted in our Arizona soils. These planting standards are a compilation of research studies of other Universities, American Forests, International Society of Arboriculture, and independent research of leading national Horticulturists with modifications for Arizona soils and climate.)

ALERT: New Tomato Virus Identified in Arizona

A plant virus identified in Arizona in the fall of 2006 threatens not only home gardens, but also the commercial tomato industry in the state. Tomato yellow leaf curl virus, also known as TYLCV, was found in two home gardens in the Phoenix area.

Tomato plants infected by TYLCV develop severely curled, yellowing leaves, shattered nodes and short stalks. The virus causes many of the flowers to abort, lowering fruit set and reducing yields. Symptoms are most apparent on the growing tips of plants, where the newest growth is taking place.

“You’ll see very small, stunted plants that aren’t going to be able to produce fruit—not good enough for shipping and storage,” said Dr. Judith Brown, a virologist and whitefly vector biologist in the Department of Plant Sciences at The University of Arizona.

“The virus stresses the plants beyond belief, and they simply stop growing,” Brown added. TYLCV infects not only tomatoes, but also beans and peppers in home gardens, and some ornamentals.

Brown isolated DNA and identified the virus from plant

samples submitted by Mary Ann Garewal, a UA-Certified Master Gardener in Surprise, who observed symptoms and collected samples from her vegetable garden and another Phoenix gardener. At about the same time, Brown also identified a distinctly different isolate of the virus on infected commercial tomato plant samples from Sonora, Mexico, suggesting that the two isolates came from different sources.

The plant samples from both Arizona and Mexico were also infested with the “B” biotype of the sweet potato whitefly, *Bemisia tabaci*, which feeds on the leaves and can transmit the virus to other plants through its saliva.

TYLCV first infected tomatoes in the western hemisphere in the Caribbean and along the eastern coasts of both the United States and Mexico in the early 1990s. “It seemed to be contained in those areas until it was introduced in Texas last summer,” Brown said.

The source of that outbreak was traced to infected commercial transplants that were possibly infected by virus in plants brought in from out of state. TYLCV also has been tracked from the east coast states of Mexico to the Pacific coast production area in the state of

Sinaloa, where the virus ravaged commercial tomato crops throughout the state during the spring of 2005 and again in the fall and spring of 2006, according to Brown.

“In the summer of 2006 we next found it in Sonora,” she said. “Now it’s becoming a giant epidemic across the Pacific coastal Mexican states, causing heavy yield losses in fresh-market tomatoes and peppers that are exported to the United States.”

Read more at: <http://ua-news.org/cgi-bin/WebObjects/UANews.woa/8/wa/SRStoryDetails?ArticleID=13597>



Tomato yellow leaf curl virus TYLCV)



Will ‘Meyer’ lemons grow well in Cochise County? I would like to purchase one and plant it out in a protected part of my yard.

(Continued on back page)

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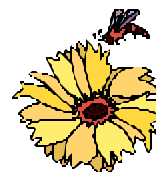
'Meyer' lemon is not winter-hardy where temperatures fall below 25°F. That definitely includes Cochise County. The best way to grow citrus here is to plant them in big pots that can be brought inside during the winter. Citrus need bright sunlight to grow well. Even in the sunniest spot indoors, it may lose lots of leaves and may go dormant if temperatures are below 55°F. The lemon tree will usually re-leaf outdoors in spring when night temperatures rise above 60°F. 'Meyer' lemon is a three-way cross between a lemon, an orange, and a mandarin. It was introduced in 1908 from China by Frank Meyer, an employee of the USDA. He's the same guy who discovered 'Meyer' zoysiagrass. 'Meyer' lemon fruit is less acidic than a regular lemon and makes a tasty lemonade. The flowers are pleasantly fragrant and

the tree bears fruit readily when young. A three-year old plant might produce ten fruits. As the plant matures they can become very productive and produce fruit year around in the right environment. The lemon fruit is green in color until it matures. After several weeks of 90°F. temperatures in summer, the lemon changes to a yellow-orange color. While the tree is outdoors, fertilize every six weeks with a general-purpose houseplant or slow release fertilizer. Do not fertilize in winter. Watch out for tiny webs on and between the leaves—they indicate spider mites. They are hard to control if they become established and numerous.

S o u r c e : <http://www.hort.purdue.edu/newcrop/morton/lemon.html>

Robert E. Call

Extension Agent, Horticulture



April Reminders

- ◆ Stake new trees
- ◆ Prepare for pests—put out codling moth traps
- ◆ Plant cool season veggies (Bulletin—*Vegetable Varieties for Arizona* is available at the Cooperative Extension offices.)
- ◆ Fertilize (Bulletin—*Fertilizing Home Gardens in Arizona* is available at the Cooperative Extension offices.)