



Master Gardener Newsletter

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- Cooperative Extension Service
- U.S. Department of Agriculture
- College of Agricultural, Consumer & Environmental Sciences

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Plant of the Month

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THE OCOTILLO

The Ocotillo (*fouquieria splendens*) is not a cactus since it grows true leaves. It is a curious and unique desert plant of the southwestern U.S. and northern Mexico. It's also one of the strangest plants of the arid West and one that was used in Southwest landscapes for centuries before Europeans arrived. The common Ocotillo is found over a large range of the Sonoran and Chihuahuan deserts from Baja, California eastward to the Trans-Pecos in Texas and south to Zacatecas, Mexico. Its natural habitat is open, stony, well-drained desert slopes below 5,000 feet.

For much of the year, the plant appears to be an arrangement of large spiny dead sticks, although closer examination reveals that the stems are partly green. With rainfall the plant quickly becomes lush with small ovate leaves appearing in bunches above spines, which may remain for weeks or even months. Its leaves can sprout within three days of a rainfall. The intense contrast between its spiny branches and its brilliant flowers adds flair to any landscape design.

Essentially trunkless, the common Ocotillo forms a wand-like, many stemmed shrub 10-30 feet tall. Each of the slender branches is adorned with stiff spines. Ocotillo is generally leafless except for brief periods following a rain when 1/2 inch to 1 1/2 inch elliptical waxy leaves are rapidly produced. Once the moisture disappears the leaves drop off almost as quickly.

The Ocotillo can be relied on to bloom annually, even without leafing in particularly dry springs. It is leafless most of the year, except immediately after rain. Bright red flowers, with five short lobes curled back into 10-inch clusters appear in spring and summer, occurring as a group of small tube shapes at the tip of the stem. They appear at the ends of branches March through June or later, depending on rainfall.

Article Continued on Page 2

Please submit information, articles, and suggested topics for the December newsletter to Ann Shine-Ring by Wednesday, the 25th of November:

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The Ocotillo – Continued from Front Page

A UNIQUE DESERT PLANT: Ocotillo is a deciduous, drought tolerant shrub. From its root crown it grows stems that can be any where from 9 to 30 feet tall. These stems grow in an "S" like pattern making the shrub look like an inverted funnel. its stems are covered with spines that can be 1.5 inches long. The leaves turn brown and fall off when water is scarce. When the leaves die the stalk and part of the stem become woody and form spines.

The Ocotillo has adapted to its environment by shedding its small leaves during dry spells. It can also grow new leaves usually 3-5 days after getting water. It has a shallow, but wide root system, which it uses to gather rainwater. It produces food because the Ocotillo can perform photosynthesis during dry spells.

Ocotillo's younger stems have a grey, waxy coating but underneath this is photosynthetic tissue, which allows the plant to synthesize sugars even when the leaves have dropped. The first leaves to be produced on a stem have a pronounced leaf stalk (petiole) and midrib. When these leaves die the petiole and part of the midrib remain on the plant and become woody to form the spines. Then very short (almost invisible) branches arise at the base of each spine, and these branches produce leaves repeatedly in response to periods of rainfall.

Ocotillo has the ability to refoliate after rain. Four or five crops of leaves may be produced annually. The leaves mature within a few weeks and are then shed. The plant is dormant when leafless. It's protected from further water loss by its waterproof bark. The bisexual scarlet flowers are clustered at the stem tips is a capsule that contains numerous, winged seeds.

Ocotillo is very plentiful and not endangered because it's the only *Fouquieria* to be cultivated. It's easily grown from seed and cuttings and sold as nursery stock. The shrub is often used as "fencing" because its spines stop people and animals from passing through. The Ocotillo can be planted at anytime of the year. The Ocotillo is a desert success story because it has adapted to its environment and is useful to both animals and mankind.

The Ocotillos' root system is shallow with a few laterals branching from the main taproot just below the soil. Surface taproots usually penetrate to a depth of 3 to 6 inches.

The plant has the physical capacity to produce leaves without the concurrent movement of nutrients or hormones from the roots, and without addition of exogenous nutrients or hormones. The process is dependent of water availability. Cut Ocotillo stems decoupled from root activity can began to refoliate within 24 hours after being placed in water, even after months of dry storage.

Ocotillo has extra-floral nectaries (nectar-secreting glands) located on the flower buds that may promote mutualistic inter-actions with insects. Insects gain nutrients and water while Ocotillo gains decreased herbivory (ability to repel plant-eating animals) particularly during the reproductive period. Ocotillo reproduces by basal sprouting and sprouting from the stem.

HABITAT: Ocotillo is abundant in the Southwest were soil is well drained on rocky slopes, mesas, out washed plains and desert grasslands. This plant is a dominant species in desert scrub, lechuguilla (Agave lechuguilla) scrub, and yucca (*Yucca* spp.) woodland vegetation of the Chihuahuan Desert on rocky bajadas, slopes, and ridges. *Article Continued on Page 3*

**FACTS PAGE:**

- ▶ Other names for Ocotillo include: Candlewood, Slimwood, Coachwhip, Vine Cactus, Flamingsword, Jacob's Staff.
- ▶ The Ocotillo family (*fouquieriaceae*) is unique in that it has but one genus, *fouquieria*. Both the family and the genus were named in honor of Dr. Pierre Fouquier, an 18th century French professor of medicine.
- ▶ The *Fouquieria* genus includes several species, of which the common Ocotillo is included.
 - F. *splendens*, palo adan or Adam's tree (F. *diguetti*)
 - F. *macdougalii*, the tree Ocotillo

▶ Three subspecies are accepted by some botanists:

Fouquieria splendens subsp. *splendens*
Fouquieria splendens subsp. *breviflora*
Fouquieria splendens subsp. *campanulata*

- ▶ Soil: Rocky, calcareous or igneous, well draining.
- ▶ Exposure: Full sun
- ▶ Temperature Tolerance: Cold hardy to 10°F.
- ▶ Water: drought tolerant, 8 inches/year minimum.

Scientific Classification:

Kingdom: Plantae Order: Ericales
 Family: Fouquieriaceae βGenus: *Fouquieria*
 Species: *F. splendens*

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- *Landscaping with Native Plants of the Southwest*, 2007
- Mountain States Wholesale Nursery website
- *Using the Desert Plant Ocotillo as an Herbal Medicine*, by April Horton, July 2009
- "What Kinda Cactus Izzat?" in *Who's Who in the Desert* by Reg Manning, 2000
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(Research and compilation of information for this article conducted by Ann Shine-Ring, Certified Master Gardener)

The Ocotillo—Continued from Page 2

HABITAT—Continued: Ocotillo is found on dry, well-drained, rocky slopes, mesas, bajadas, outwash plains, and valleys in desert shrub and desert grassland habitats soils are generally rocky, shallow, and of limestone or granitic origin and are often underlain by caliche. Ocotillo generally occurs from sea level to approximately 5,200 feet (1,600 m) elevation. It may reach its upper elevational limits 900 to 1,500 feet (270-450 m) higher on limestone than on granitic soils. In the Guadalupe and Del Norte mountains of the Trans-Pecos region of Texas, Ocotillo is found on limestone ridgetops, outcrops, and slopes, at elevations as high as 6,700 feet. Ocotillo may also occur at higher elevations in oak woodlands above desert grassland communities. Its aspect is generally south or southeast, where surface temperatures allow daily thawing even with freezing air temperatures above the surface layer.

In the Sonoran Desert, Ocotillo is a dominant member of mixed woody, succulent scrub, creosote bush (*Larrea tridentata*) scrub, and shrub-grassland associations on well-drained rocky slopes, bajadas, and alluvial fans, often with shallow soils. Ocotillo is associated with, or in close proximity to, riparian habitats along rivers, floodplains, or desert washes. In these instances Ocotillo may occur with narrowleaf cottonwood (*Populus angustifolia*), Fremont cotton-wood (*P. fremontii*), boxelder (*Acer negundo*), Arizona walnut (*Juglans major*), honey mesquite (*Prosopis glandulosa*), sycamore (*Platanus* spp.), oaks (*Quercus* spp.), and blue paloverde (*Cercidium floridum*) Removal of grasses by grazing may allow shrubs, including Ocotillo, to increase in low desert grasslands.

ANIMAL & BIRD INFLUENCE: Ocotillo use by deer in Arizona and New Mexico is considered low. Desert bighorn sheep in the Harquahala Mountains in Arizona eat ocotillo. Ocotillo has no forage value for livestock, although cattle and goats have been observed browsing on it in Rio Grande floodplains. Birds of the Organ Pipe National Monument utilize Ocotillo for foraging. When in leaf, Ocotillo provides cover for birds & small mammals.

PESTS & DISEASES: Ocotillos that had not leafed out after one year have been discovered to have been attacked by the Ocotillo borer *Chrysobothris edwardsi*. The borers generally go for live tissue under stress. It is also thought that Ocotillo fences either dead or alive would be attracters. The beetles fly from spring till end of summer and can overwinter either as eggs in the plant or as small larvae. All activity happens in the plant. The borer is about 1/2-3/4 inches long and is fast! Systemics do nothing as a prophylactic against woodborers. They are designed to deal with insects that have piercing sucking mouthparts, ones that feed in the Phloem and Xylem tissues, not borers. The best time to salvage Ocotillos is during fall and winter to avoid beetle activity.

POLLINATION: Hummingbirds that like the honey nectar it produces pollinate the Ocotillo. It is certainly true that hummingbirds rely heavily on the nectar of Ocotillo flowers to sustain them during their annual migration northwards from Mexico to the mountains of the western U.S. The endangered Lucifer hummingbird's habitat in New Mexico centers on slopes and adjacent canyons in arid mountain areas dominated by Ocotillo and agave species.



POLLINATION—Continued: But hummingbirds may not be the only (or even the main) pollinators of Ocotillo. Large carpenter bees can be equally effective when they crawl over the inflorescences and bite through the flower tubes to get the nectar. Ants, antelope and ground squirrels also eat the Ocotillo's flowers.

SEEDING: Each Ocotillo plant produces at most a few hundred highly viable seeds (viability of 90%) per year that are known to germinate after rain. The winged seeds of Ocotillo are probably wind dispersed. Germination remains relatively high (about 40%) even after 8 days of exposure to temperatures of 104° Fahrenheit for 12 hours each day. This lack of sensitivity to high temperatures suggests that Ocotillo can germinate readily after late summer rains. Its seeds probably do not survive for long in the soil. It probably requires a sequence of favorable conditions to regenerate well, such as heavy winter rain for seed production followed by heavy summer rain for seedling establishment. It has been reported that Ocotillo has low and erratic seedling establishment and a large amount of seedling mortality due to moisture stress. After summer rains extremely high densities of seedlings (more than 100/sq m) have been observed, but less than 1% of those survived to 1 year of age. Survival from year 1 to 7 was approximately 27%.

MEDICINAL USES: Ocotillo has been used for hundreds if not thousands of years by native peoples of North America. It is actually an amazing plant—it is a perennial that can live up to 200 years!

Ocotillo flowers can be made into tea or jelly. Ocotillo can also be used for various ailments as a medicine and is best known for treating colds and bronchitis among native desert peoples. It is also very useful for all types of pelvic inflammation such as ovarian cysts, prostate issues as well as edema or bloating. (Not recommended for use by pregnant women.)

Some Ailments Ocotillo Can Treat

Sore Throats	Prostatitis
Coughs and Lung Ailments	Ovarian Cysts
Hemorrhoids	Stimulating Menses

You can prepare your own Ocotillo tincture. First, break off several branches and peel off the spiny outer layer and leaves. Be sure to use tongs and wear thick leather gloves! You will then want to cut up the inner portion in little pieces. Cover this with 3 times the amount of Everclear or vodka. Store in a tight lidded jar in a cool dry place for up to 4 weeks. After this time strain out the plant matter and reserve the liquid. Take 30-60 drops 1-3x per day. Be sure to label your tincture and keep it out of reach of animals and children. It can be stored in a dry and cool cupboard for up to 5 years.

Ocotillo can be ordered online and is found in some health food stores. It tends to run about \$10-\$15 per 2oz bottle.

OTHER USES: The resin and wax from Ocotillo bark is used for conditioning leather. Historically, Cahuilla Indians ate Ocotillo fruits and flowers. Roots were powdered by Apache Indians and used to treat wounds and painful swellings. They also bathed in an Ocotillo root mixture to relieve fatigue. A beverage made from Ocotillo flowers was used for cough medicine. *Article Continued on Page 4*

The Ocotillo—Continued from Page 3**OTHER USES-Continued:**

Ocotillo produces tannins, which may help in its defense against herbivory (being eaten by plant-feeding animals).

LIVING FENCES OR WALLS: In the Southwest, Ocotillo stems are cut and planted close together to make living fences or walls. Ocotillo makes an excellent ornamental in desert landscaping theme and cactus gardens. Ocotillo poles are a common fencing material in their native region, and often take root to form a living fence. Owing to lightweight and an interesting pattern, these have been used for canes or walking sticks. Mature plants have as many as 75 slender branches (canes). Planted in rows, Ocotillo become living fences. One often hears the stories of living fences and corrals being constructed from stems laid closed together in trenches. While this is true, the fence requires a bit of bolstering with wire to keep the upper stems connected.

**GARDENING CONSIDERATIONS:**

--Site Selection: Ocotillos can become quite large so they should be provided ample room to grow. Older specimens may reach 15-30 feet in height and 10 or more feet in width. Care should be taken when placing them near walks, drives and structures. If planted too close to a wall the wind can create quite a ruckus as the canes scrub the surface. The site should be open and sunny to allow for best growth. Again, soil drainage is critical as most problems associated with Ocotillos are related to poor soil percolation.

--Planting: Most garden experts agree that Ocotillos may be planted successfully at any time of the year, but that spring and fall are best for ease in transplanting. Wild harvested plants are particular to the orientation of the sun requiring planting in the same direction as the plant was in the wild to avoid sun scorch. As a rule, nursery-grown plants are placed fairly close together in rows and generally do not have issues related to sun scorch. There is no need to worry about orientation for bareroot or container grown Ocotillos.

Planting depth is more critical; so pay particular attention to the soil line on the trunk. Upon close inspection, a distinct mark will be visible where the trunk emerges from the ground on bareroot plants.

GARDENING CONSIDERATIONS-Continued:

--Planting-Continued: This is the target for the soil line during back fill. Containerized plants should be planted no deeper than the depth of soil in the box. The planting hole should be wide enough to accommodate the root system and no deeper than the root system. Once the hole is dug be sure to check for drainage. If it drains within an hour you are good to plant. If it takes longer than this then you should consider changing locations or mounding the soil at the planting site. Placing gravel at the bottom of the planting pit will not improve drainage. There is no need for adding organic amendment to the soil. The roots of bareroot plants should be inspected for any broken or damaged roots. These should be cleanly pruned prior to planting. This has been done already on containerized plants so do not disturb the rootball. Care should be taken to ensure that there are no air pockets in the backfill material. Use a shovel handle to work soil in around the roots of bareroot plants to ensure that the backfill is packed firmly around the roots. This can be done with containerized plants as well using water to help fill voids with a mud slurry. There should be no need to use stakes or guys even though the plant is placed very shallow in the soil. If, however, there are issues with blow over on bareroot plants consider using large stones placed 6 inches or so away from the trunk to support the canes until they root.

--Transplanting: Transplanting Ocotillos can also be done year around with knowledgeable care, but greatest success is achieved during March through May. Transplant to the original growing depth and, as with cacti, replant them in their original directional orientation (place the Ocotillo's south side which has become more heat and sunlight-resistant, again in the hotter southern direction.) Well-drained sandy or gravelly loam soils with light to moderate amounts of organic content favor root development. Sunny, open, unrestricted locations and those where surface water does not collect are best. Some degree of growth setback is to be expected. Properly transplanted, however, natural desert plants reestablish themselves fairly successfully. Be patient with transplants-- some may take up to a year to recover and reestablish in their new locations. For your own protection, purchase your Ocotillo plants from a reputable nursery source.

--Irrigation: Many experts disagree about this topic. Some indicate that Ocotillos should not receive any flood irrigation for 30 or more days to avoid issues with root rot. This is primarily for wild-harvested plants. For freshly dug, field grown and containerized plants, they should be watered frequently, preferably with drip irrigation placed in a wide, shallow well (4" x 18" to 30"). The drip emitters should be kept 6"-12" from the trunk. Most agree that freshly planted Ocotillos should be irrigated weekly at a minimum during summer months and twice per month during winter. Once established (you will know when they leaf out routinely and start to flower which may take anywhere from 6 to 24 months) then you can begin to back off on the water.

Most established Ocotillos do not require any supplemental water during the cooler months and certainly no more than every second to fourth week during the hottest of summers.

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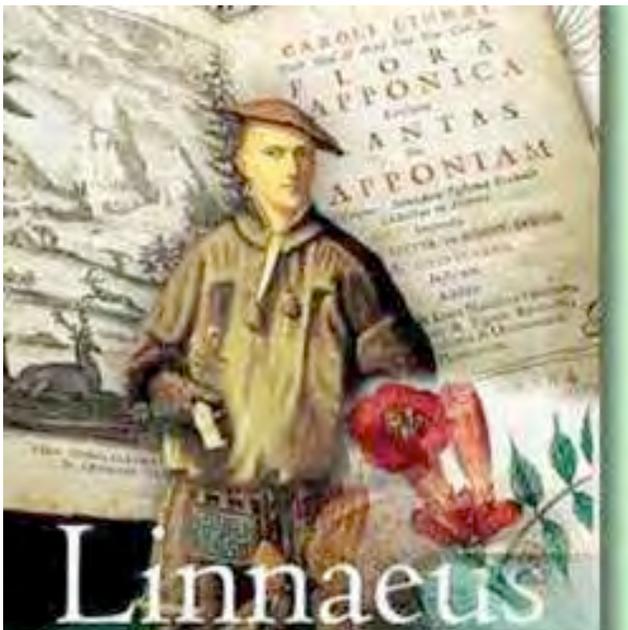
The Ocotillo—Continued from Page 4



--**Irrigation-Continued:** Daily misting of the canes has been purported to greatly enhance survival of bare root Ocotillo, which must develop an entirely new root system. Others feel that keeping the soil moist is sufficient. Either way it is essential to keep the plant hydrated until such time that the plants become established. You can tell if the plant is still alive by checking the canes to see if they are still pliable and have a greenish color to them. Containerized plants become established at a much faster rate than bareroot plants.

--**Maintenance:** Ocotillos should not require too much in the way of maintenance. Checking the soil moisture is the most important item. They also do not require any supplemental fertilization. Nutrient deficiencies are unheard of on properly irrigated plants. Pruning should be limited to the removal of dead or broken branches. If a cane requires removal it should be cut at the bottom of the trunk, as the canes will readily sprout where the pruning wound occurs. Cutting at an incorrect height will create an odd looking specimen that will ruin the natural appearance. Ocotillos should never be sheared.

Once established, Ocotillos are not prone to insects or disease. Occasionally a young plant will succumb to root rot if over watered. Older plants are susceptible to borers if heavily stressed with drought. Most other problems can be avoided through deep, infrequent irrigation and allowing the soil to drain thoroughly between irrigation cycles. ■

From Abelia to Zinnia: A Gardener's Introduction to the History and Origins of Botanical Plant Names

By Elizabeth MacInerney, October 2009

Why is "rubrum" used in naming Red Maple and "rubra" used for Red Oak? Isn't red, red? What's the connection between *Hosta fortunei* and *Euonymus fortunei*? Many plant names used today have a rich history stemming from ancient times, old world linguistics and early naturalists. This subject matter is extensive; the author offers a small sampling to whet our appetites.

—**From Classical Latin to Medieval Low Latin Becomes**

Botanical Latin. Scholars and academics have discussed the forms of Latin and suitability of many Latin words and phrases for centuries. In the mid-18th century, Latin had already evolved from the classical Latin of Roman scholars to the Medieval Latin of academia, politics and ecclesiastical use. It was even further refined to a form that suited the descriptions required in the study of botany. The ancient language of early Greece played an important role in shaping many of the words as botanists searched for adjectives and words that resulted in greater precision and accuracy. William T. Stearn describes Botanical Latin ".... as a modern Romance language of special technical application, derived from Renaissance Latin with much plundering of ancient Greek...." Today, we still discuss the correct pronunciation and usage of Latin as it continues to be the subject of debate. In addition to the influences of the Greek and Roman languages on botanical Latin; other less known but certainly noteworthy influences have included the languages of Germany, Holland, the Middle East and the Orient.

—**We Should Have Learned Latin in School** Had we known we were destined to be Master Gardeners, we would have studied Latin in school. For a thorough understanding of how Latin is used throughout botanical nomenclature, and the language of science in general—one needs to have an understanding of the structure of the Latin language and its appropriate rules of grammar. It is a language filled with prefixes and suffixes, declensions, gender, number and case agreements, stems and roots. It is because of these grammatical policies that we have *rubrum* and *rubra*! For many of us, the mysteries of Latin will likely remain so. There are, however, many excellent reference books available for gardeners curious to know more. Several by William T. Stearn (described as the modern day Linnaeus) are available.

—**Binomial System Became the Standard in Mid-18th Century** Latin changed the way scientists, naturalists and students of botany and zoology would name and classify plants, fungi and animals. This methodology was adapted and popularized by the Swedish physician and botanist, Carolus Linnaeus in the mid-1730s and published in several important works including *Systema naturae* (1735) and *Philisopha botanica* (1751). The binomial system adapted to botany, replaced the complex naming format that was in place at that time which included lengthy descriptions in Latin and borrowed words from the Greek language. Essentially, the binomial system involves the use of two principle words to denote the name of an organism. The first word is the genus for example *Achillea*. The second word is the specific epithet for example *millefolium*. The correct form to write these words is to italicize both words but only capitalize the first word—*ACHILLEA millefolium*. Sometimes the words are underlined rather than italicized—Achillea millefolium. This is acceptable too—but don't underline and italicize at the same time. *Article Continued on Page 6*

History & Origins of Botanical Names—Continued from Page 5

—Geographical Place Names, Habitat & Famous People Both Real and Mythological are just some of the many variables, which have influenced the binomial naming of plants. Plants indigenous to certain geographical regions of eastern North America or the Orient may be named with specific epithets such as *canadensis*, *pennsylvanica*, *japonica* or *chinensis*. Habitat is also an important influence on plant names. Consider “arvensis” as in *Mentha arvensis*, *Veronica arvensis* or —Stearn notes that “arvensis” refers to “growing in or pertaining to cultivated fields.” Some familiar specific epithets include *fortunei*, *x jackmanii* and *davidii* and are so named after notable figures in the horticultural world. The genera *Abelia*, *Forsythia* and *Zinnia* pay tribute to notable botanists while *Narcissus* comes from classical Greek mythology.

—Perhaps, the Greatest Contribution to Plant Names comes from the vast collective of characteristics of plants themselves. The morphology of plants including flower parts, fruits, seeds, reproductive organs, roots and stems, shape of leaves, margins and form are described in a myriad of ways. Color, shape, texture, margins hairy, smooth, upright, creeping and twining are all expressed in words whose origins may be Greek, Roman, Germanic and so on. In fact during the 19th century, naturalists and botanists who were successors of Linnaeus focused extensively on the descriptive terms of plants based on their shape, organs and attributes. Take for example, the ornamental grass *Calamagrostis acutiflora*. This can be broken down as follows: *Calam* (reed-like), *agrostis* (a kind of grass), and *acu* (sharp) and *flora* (flower). Once you start to learn some of the more common words and stems you will observe how they repeat themselves. Without knowing too much Latin one can deduce that words like floriferous, floribunda, and floridus relate to the flower. Folium, foliage and foliaceus are referring to the leaves of a plant, for example *Trifolium pratense* (trifolium=having three leaves.)

—Today, the International Code of Botanical Nomenclature (ICBN) determines the guidelines for new plant names. The ICBN (governed by the International Botanical Congress and the International Association for Plant Taxonomy) has determined that the formal start point of our current system of botanical nomenclature (system of naming things within a larger group) coincides with the publication of Linnaeus' *Species plantarum* on May 1, 1753. Today's plant naming is a little different than in Linnaeus' day because of the thousands of cultivars that are available and continue to be developed. Cultivars are generally vernacular or fancy names rather than Latin and are not italicized but are enclosed in single quotation marks for example 'Goldstrum'. The naming of cultivars is also regulated and under the direction of the International Code of Nomenclature of Cultivated Plants. Additionally, the naming of new species does not have to have its origins in Latin (as was deemed mandatory by Linnaeus in his time), although the International Code does recommend botanists "...to use Latin terminations in so far as possible...."

—Communication in Horticulture Often Relies on using the botanical names for plants to ensure accuracy. Imagine a discussion about Moon Flowers without the accuracy afforded by using botanical names. Do you mean *Ipomea* or *Datura*? Each plant species has its individual binomial that is unique to that genus and specific epithet. Botanical Latin transcends language barriers and is truly a universal language for horticulturist, botanists, and naturalists and, of course, gardeners. While understanding the taxonomy of plants and the history of their nomenclature may not be imperative to rewarding gardening; it does provide one with an historical connection to some of the great pioneers in the field of botany and horticulture and the complexities of ancient languages. ■



—Red-Tailed Hawk—

A Bird's-Eye View

By George Harrison, *Birds & Blooms*, 2009

Birds see and their vision differs much from our own. Here are some important facts:

- ✦ Birds have highly developed vision, detecting movement much faster than humans.
- ✦ The eyes of songbirds are on the sides of their heads and are tightly fitted into their skulls, giving them limited vision unless they move their heads.
- ✦ Owls' eyes are in the front of their skulls, giving them binocular vision which helps them see prey at night.
- ✦ Most bird eyes are larger than humans' relative to the weight and size of the skull. A songbird's eyes are about 15% of the weight of the skull, while human eyes account for only about 1% of the skull's weight.
- ✦ Birds see color differently than humans because they have four types of color sensitive cones, including ultraviolet, while humans have only three.
- ✦ The eyes of an American woodcock are located toward the front of the head, enabling it to see the approach of predators in front, above and behind it while its head is down.
- ✦ Hawks and eagles have five times as many visual cells as humans, allowing them to distinguish forms with more accuracy and at greater distances.
- ✦ Birds have three eyelids: an upper, a lower and a nictitating membrane that covers the eye completely to lubricate it and protect it from injury.
- ✦ Because most birds have little or no sense of smell, they depend on sight to forage for seeds, insects and fruit.
- ✦ Birds' eye colors vary by species, sex and age, but the pigment is found only in the iris. Most songbirds' eyes are dark brown, but a few have yellow, red, blue or green eyes.

Dixie's Honey Do List for November



If our bullets are followed by (MI), the information came from *Month by Month Gardening in the Desert Southwest* by Mary Irish. We just wanted you to know that this is an outstanding book.

In General: We've already experienced our first freeze of the year. Also, remember, "Do not prune in November!"

Ornamentals

- Finish planting spring flowering bulbs. If you plant tulips, give them a northern exposure and light shade, if possible.
- Fertilize bulbs and cool season annuals lightly with a 1-2-1 ratio fertilizer.
- Continue planting winter-hardy shrubs, flowers, and wildflower seeds.
- Protect tender plants from freezing temperatures with frost cloth, blankets, boxes, or other lightweight materials.
- After the first killing freeze, cut back stems of cannas and dahlias to the ground and discard the leaves (MI).



Fruits, Nuts & Shade Trees



- Plan pruning activities. Flag limbs for major winter pruning, but prune dead, diseased, or damaged limbs anytime.
- Wait until late winter to prune cold-tender plants.
- Begin harvesting pecans as shucks split with freezing temperatures.
- After hard freezes begin, water established trees once a month. Water newly planted material weekly or as needed.
- If you didn't apply dormant oil late last month, then do so now to control insects that overwinter in crevices of bark.

Vegetables & Herbs

- Plant head lettuce after mid-month.
- Continue planting garlic.
- It's time to plant rhubarb.
- Finish pruning Mediterranean herbs.
- Water established herbs once a week or less depending on the temperature. Vegetables should be watered every three days. (MI)



Lawns/Grasses



- Warm season grasses are going dormant. Do not fertilize and reduce irrigation frequency to once or twice a month after first hard freeze. When irrigating, water deeply to a depth of 6-8 inches.
- Wait until spring to 'scalp' warm season grasses. After this task, tune up lawn mower.
- Continue fall management schedule for cool season turf. Fertilize at a rate of $\frac{1}{2}$ lb N/1000 ft². Water regularly to a depth of 6-8 inches and raise mower height to provide extra frost protection for crown.

Dixie's Honey Do List for November—Continued

Roses

- Do not prune roses until late January or early February.
- Continue deadheading roses regularly. Remove any dead or diseased canes. (MI)
- Be sure to keep the area around rose plants clean of debris and fallen leaves, particularly if powdery mildew has been a problem. (MI)
- In mild winter conditions, extend watering roses to every ten days depending on the weather. (MI)
- Begin to plan which new roses you'd like to plant in your garden in late March or early April after the danger of freezing has passed.



Cacti & Succulents



- Continue to plant cool-season succulents like aloes, gastera, and dudleya. Native succulents can be planted this month, but be careful that they are not overwatered through the winter. Do not plant cold-tender succulents this month. (MI)
- Water cool season succulents every 2 to 3 weeks while temperatures are cool; water warm season succulents every 5 to 6 weeks. (MI)
- Late this month, Christmas cactus should be showing flower buds. Once buds are set and are about 1/2 inches long, gradually move the plant into more light over a week or two. Plants will grow best in a spot with bright, indirect light that is cool and away from drafts and hot spots like a fireplace, heater vent, the top of a television or refrigerator, or in a west-facing window. Remember, sudden changes in temperature or light will cause the buds to fall off. (MI)
- Do not prune this month. (MI)
- Fertilize any winter-growing succulents growing in a pot once a month with a water-soluble fertilizer at half the strength recommended for houseplants. Use a fertilizer that has a low-nitrogen content. (MI)
- Mites can invade aloes and cause a distorted, ruined-looking central bud. There is virtually no cure for this infrequent problem other than to destroy the plant before it can infect other aloes. (MI)

Miscellaneous

- Renew mulch especially around tender plants.
- Mow up fallen leaves and incorporate them into compost pile.
- Clean and store garden tools using steel wool on shovels, hoes, and spading forks, then oil lightly to prevent rust. Use linseed oil on wooden handles.
- Insulate hose bibs.
- Drain unused hoses.
- Winterize drip irrigation systems. Install flush valves that keep water out of irrigation tubing when system is not in use.



NEW NMSU PUBLICATIONS (Contributed by Mona Freeman, 2009 MG Intern)

Guide H-326: Minor Small Fruit Crops for New Mexico Gardens (Revised July 2009). This revised guide includes sea buckthorn (sea berry) as a small fruit crop. Also included are tayberries, currants, gooseberries, elderberries, and bush cherries.

Guide W-101: Sanitizing Stored Water Supplies (July 2009) discusses how to maintain a clean source of water stored in tanks for human consumption. Instructions for sanitizing the tank is discussed as well as tips for maintaining clean tank water.

Circular 597: Chemical Weed and Brush Control for New Mexico Rangelands (May 2009). This new circular discusses current suggestions for herbicide use to control woody and herbaceous weeds on rangelands. Circular primarily consists of tables of specific herbicide use on individual plants needing control.

Circular 644: Assessing Alfalfa Stands After Winter Injury, Freeze Damage, or Any Time Renovation Is Considered in New Mexico (August 2009). This new publication addresses prevention of winterkill in alfalfa, assessment of stands for replacement, and recommendations for stand replacement.

Circular 645: New Mexico Peanut Production (July 2009). Varieties of peanuts for commercial production are discussed in this new circular. Information includes land selection, crop rotation, soil preparation, seeding, irrigation, harvesting, weed control, and diseases and pests of peanuts.

Circular H-246: Starting A Community Vegetable Garden (Revised October 2008) is now available in Spanish. Guidelines for formation and operation of a community garden are discussed.

New Master Gardener Profile: Hope Movsesian



Hope Movsesian took the Master Gardener class in 2008 at the encouragement of her friend and fellow MG Intern Kelly Covert. According to Hope this was an opportunity, “to learn exactly *what* we had been doing and needed to do for the plants now residing in our gardens. The classes have opened a new world of knowledgeable possibility.”

Hope and her husband Matt built their home in the north valley, a mile south of Hill, in 2003-2004. Their piece of heaven is 1.94 acres with an amazing view of Hope’s favorite mountains, the Doña Anas. Hope admits she started gardening before their place was really ready but she needed to take full advantage of Rowland’s ‘going-out-of-business’ sale. The end result was she had to overwinter several trees and shrubs.

Hope has been hitting the sales ever since and appreciates much help from her friends, too. The Movsesians have been going full tilt for almost six years now. “Matt’s the sensible one,” Hope says. He insists there has to be water available before starting another area. For the most part this happens but she does tend to be just a smidge ahead of his drip lines.

Before they built the north valley home, Matt and Hope lived in town where their gardening was limited to a small vegetable garden. They also re-landscaped their place to a xeriscape environment and put in a couple of flagstone patios.

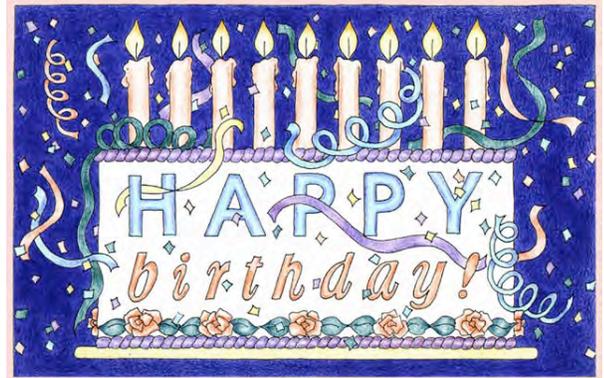
It has been a different story at the new location though. Hope believes her grandmother’s green thumb was passed on to her by her mother. The Movsesians work together taking full advantage in this larger space with an orchard, vegetable garden, many trees and flora. Hope leans toward natives or drought tolerant types, and seems to like the poky plants.

One of Hope’s goals as a Master Gardener is to learn to extend the life of their plantings to their utmost in the best possible environmental manner. She wants to create a bird-happy haven. “We love to see each new feathered friend come and stay awhile, butterflies and bees too are welcome,” Hope says. “They all become subjects for my camera.”

Hope is forever grateful that her father’s job with McDonnell Douglas took her family to the high desert regions of California as well as Las Cruces. She can’t imagine living in the humidity of Missouri where she was born. She has lived in Las Cruces since 1979, which almost qualifies her for ‘native New Mexican’ status.

Beyond gardening, Hope and Matt’s passion is their four dogs that share their lives. “We were always dog people, which worked out well when we met ten years ago”. They have four—two great Danes, a Sheppard/Aussie-X, and an Irish Terrier-X. Hope participates in Thera-Paws (a canine-assisted therapy program), is a member of a K-9 search and rescue team and does agility training with each respectively.

(Profile written by Ann Palormo)



NOVEMBER BIRTHDAYS

Joann Embury	Nov. 6
Lauren Bishop	Nov. 9
Valice Raffi	Nov. 12
Colette Bullock	Nov. 18
Lori Petro	Nov. 18
Bonnie Eisenberg	Nov. 21
Janie Elliot	Nov. 23

MANY THANKS FOR THE GOODIES:

We appreciate your thoughtfulness

November Goodies

Susan Blank
Janie Elliott

December Goodies

Potluck Luncheon



Ina’s Sugar Cookies

Ina Goldberg, Certified Master Gardener

- 3 cups flour (add 2.5 tbs. for high altitude)
- 1 tsp. baking powder 1 tsp. baking soda
- 1 tsp. salt 1 cup sugar
- 1 cup Crisco/shortening 2 eggs
- 4 tbs. milk 2 tsp. vanilla

Directions:

Sift dry ingredients, except sugar. Cream shortening with sugar. Add eggs. Add sifted ingredients alternately with milk to which vanilla has been added. Begin and end with flour mixture.

Roll batter into 1.5" balls. Finish by sprinkling with cinnamon/sugar mix and roll balls into one of: cinnamon/sugar mix OR colored sugar crystals OR chopped walnuts OR chocolate sprinkles.

Bake at 400 for 8-10 minutes until golden brown on an ungreased pan.

VERTICILLIUM WILT OF TREES & SHRUBS

Cynthia L. Ash

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Verticillium wilt is caused by the soil-borne fungi, *Verticillium albo-atrum* and *Verticillium dahliae*. However, *V. dahliae* is the species that most commonly attacks woody ornamentals in the United States.

Verticillium is common in many soils and affects several hundred herbaceous and woody plant species, while exhibiting definite host preferences (see Table 1). This disease can become a serious problem on susceptible hosts in infested soils, since the fungus persists in the soil indefinitely, many times on hosts that exhibit no symptoms.

Table 1. Trees and Shrubs SUSCEPTIBLE to *Verticillium*

Ash	Dogwood*	Plum
Azalea	Elder	Redbud
Barberry, Japanese	Elm	Rose
Boxwood, Korean	Honeysuckle	Russian olive
Buckeye, Ohio	Lilac	Serviceberry*
Catalpa	Linden*	Smoke tree
Cherry, other stone fruits	Locust, black	Spirea
Coffee tree, Kentucky	Magnolia	Sumac
Cork tree	Maple	Viburnum
Currant and gooseberry	Oak, pin and red (rare)	Wigela

*Some plant species are listed in both tables (linden, dogwood).

The resistance or susceptibility will depend on the cultivar and the strain of *Verticillium* present in the soils.

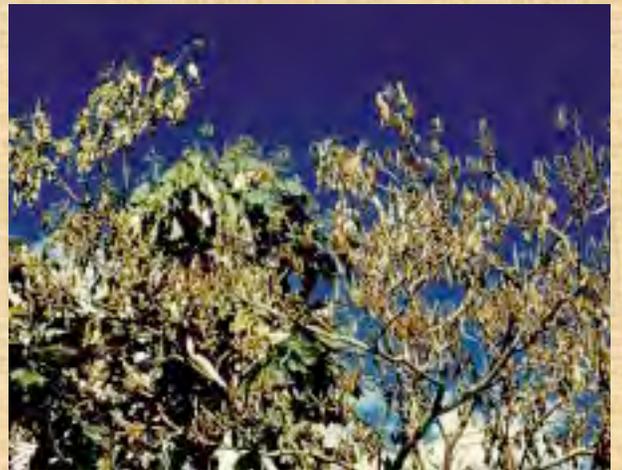
Because of its ability to spread internally or systemically within the plant and to kill the plant, *Verticillium* wilt is considered a serious disease. However, compared with a wilt disease such as Dutch elm disease, *Verticillium* is less severe. Natural stands or forested areas are rarely affected by *Verticillium* wilt. *Verticillium* wilt is often confused with other diseases or abiotic conditions. Herbicide damage, adverse environmental conditions and mechanical damage may cause the same or similar symptoms.

Symptoms caused by *Verticillium* develop anytime during the growing season, but are most apt to appear in July and August. In some cases the symptoms may be more severe during or following cool weather. Symptoms appear chronically, or they may be acute and often lethal. Chronic symptoms include small, yellow foliage, leaf scorch (marginal browning), slow growth, abnormally heavy seed crops and dieback of shoots and branches. Often, the foliage on one or more branches wilts suddenly. Acute symptoms include leaf curling, drying, an abnormal red or yellow color of leaves or areas between leaf veins, partial defoliation, wilting and branch dieback. Often one branch or one side or sector of the plant is affected. Recurrence of wilt in ensuing years is unpredictable, as is its severity. In its lethal form, *Verticillium* wilt will cause a sudden and total collapse of the plant.

Figure 1. On small trees wilting, leaf scorch and defoliation can occur quickly on a large portion of the tree, as indicated by the circle.



Article Continued on Page 11



Verticillium Wilt of Catalpa, Maple, & Elm

Natalie P. Goldberg, NMSU Extension Plant Pathologist
& R. Gary Smith, IPM Specialist, UNM

If you would like to know more about effectively dealing with *Verticillium* Wilt, a fungi that affects more than 300 kinds of plants and is found worldwide in all soil types, then read Circular 554, *Verticillium Wilt of Catalpa, Maple and Elm*, NMSU Cooperative Extension Service.

Link: http://aces.nmsu.edu/pubs/_circulars/circ554.pdf

This Circular provides, 1) a review of symptoms, 2) the biology of *Verticillium*, and 3) describes how to manage *Verticillium*. Goldberg and Smith state that, "The most economical control is to plant resistant tree and shrub cultivars. In New Mexico, more resistant trees and shrubs include all gymnosperms, monocots, and the following dicots: apples and crabapples, mountain ash, boxwood, ceanothus, pyracantha, sweet gum, honey locust, oaks, pears, pecans, sycamores, poplars, flowering quince, and willows.

For more information on *Verticillium* Wilt & how it affects trees and shrubs, see the article in the opposite column on this page.



FOR YOUR INFORMATION

► MG Contact Sheet Now Available Online

The MG Hotline Contact Sheet can now be downloaded from the Master Gardener Webpage. It can be found under "Forms." The MG Time Sheet and the MG Application are also posted at that location. (These are PDF files and cannot be filled out and returned electronically.) Again the new "shorter" MG Web address is <http://aces.nmsu.edu/damg>

(Information provided by Jan Brydon)

► Weekly Floral Sales to Begin

The NMSU Floral Team will hold fresh flower sales from 8:30 to 11:30 a.m. each Wednesday this fall semester in the Gerald Thomas Hall lobby. All proceeds go to fund team travel to regional competitions. FYI, contact advisor Sabine Green at swhitley@nmsu.edu

(Information provided by Barbara Sallach)

Verticillium Wilt of Trees & Shrubs—Continued from Page 10

Some tree species exhibit elongate, dead areas of bark on diseased branches or trunks where the inner bark is killed. Other species, such as green ash, tend to drop green leaves before noticeable yellowing, scorching or wilting has occurred. Discoloration in the annual growth rings is a symptom of *Verticillium* wilt.

Streaking of vascular tissue or wood may accompany external symptoms. This discoloration may be absent during the early stages of infection and only occasionally develops in some species such as ash, *Fraxinus* species. The streaking may be scattered throughout a branch or trunk cross-section if the plant is chronically infected, or it may be confined to new sapwood, indicating a new infection. Examination of a cross-section of a larger branch or trunk will often reveal the disease history of a tree. Peeling back the bark of wilting branches may reveal streaked sapwood if the discoloration has spread up into the smaller branches. The actual color of the streaking is dependent upon the host. In maple, *Acer* species, discoloration tends to be greenish brown, but colors range from gray-green to brown or black.

Verticillium invades the root system directly or through wounds caused naturally by root growth through the soil or soil organisms. Once in plant tissues, the fungus produces toxins and invades the xylem (water conducting tissues), moving upward in the plant via spores. Where new spores lodge in the vascular tissue a new infection begins. Toxins produced by *Verticillium* may kill plant cells at some distance from those directly invaded. Thus, the fungus often cannot be isolated from the apex of streaked wood or from wilting branches, even though damage is apparent there.

In response to invasion by the pathogen, the host produces substances called tyloses or gums that attempt to close off the invaded cells to limit fungal movement in the plant. This shutting down of infected vascular tissues reduces the flow of water from the roots upward. At this point, reduced water flow and toxins often result in external symptoms.

In maple, the *Verticillium* fungus progresses around a growth ring by a combination of upward spread and tangential growth. If the pathogen fails to cross from one season's wood to the next, the result is remission of acute symptoms and compartmentalization (containment) of the diseased wood. The severity of chronic symptoms depends upon the extent of root and old wood damage. Acute symptoms that recur after one year or more of remission indicate a new infection moving up from the roots. Trees showing general and severe wilt cannot be saved and should be replaced with a nonsusceptible species.

The fungus survives saprophytically in the soil as thread-like growths called mycelia and/or minute black resting structures called microsclerotia. In some plants the fungus may move into the leaves and persist as mycelia or microsclerotia when the leaves fall to the ground. Microsclerotia are capable of persisting for ten or more years in the soil without a host plant. However, warm, waterlogged soils result in the rapid death of microsclerotia.

Nursery crops on land formerly used for susceptible vegetable or fruit crops are at high risk of infection. Plants from such nurseries may develop wilt after they are transplanted into landscapes. In addition, microsclerotia may form on and within the roots of plants that are resistant, but not immune, to infection and that exhibit no above-ground symptoms.

Figure 2. *Verticillium* wilt typically causes the margins of leaves to turn brown giving the leaf a scorched appearance.



This perpetuates the fungus and results in the introduction of *Verticillium* into uncolonized soils via infected plant material including seeds, cuttings, transplants, tubers, scions, buds and bare root trees. Infested soil on plants and equipment also spread the disease.

Control: Managing trees infected with *Verticillium* wilt will take time and knowledge. First, confirm that the symptoms are indeed caused by *Verticillium* wilt. The presence of typical symptoms and streaking of vascular tissue is fairly diagnostic, but a lab culture test should be run to confirm the diagnosis.

Fungicides will not cure infected trees. Soil fumigants, if available, may be used for small amounts of garden or greenhouse soil before replanting, but are generally not feasible in landscapes.

The severity of disease development will depend on the strain of the pathogen, the level of susceptibility in the host, and environmental factors. Landscape trees with recent wilt symptoms should not be removed immediately. They may "recover" and perform fairly well with some environmental manipulation. In general, the most resistant plants are those grown in moderately fertile soil in which the balance of major nutrients is tipped slightly toward high potassium and low nitrogen. Generously watered plants are often invaded less extensively than those under moderate to severe water stress.

If a tree or shrub dies from *Verticillium*, never replant a susceptible tree or shrub back in the same location!

When replacing trees in areas where *Verticillium* is present in the soil, select resistant or immune trees (Table 2). Fertilize properly to promote vigorous growth and water regularly during the growing season. Remove dead and weak branches. This does not remove the fungus from the tree, but prevents infection by other fungi. DO NOT use the chipped wood as mulch unless it has been properly heated in a compost pile.

**Table 2. Trees & Shrubs
RESISTANT OR IMMUNE To *Verticillium***

Apple	Hawthorn	Oak, white and bur
Arborvitae	Hickory	Pear
Beech	Honeylocust	Pine
Birch	Hophornbeam	Poplar
Butternut	Juniper	Serviceberry*
Dogwood*	Larch	Spruce
Fir	Linden*	Sycamore
Ginkgo	Mountain ash	Walnut
Hackberry	Mulberry	Willow

*Some plant species are listed in both tables (linden, dogwood). The resistance or susceptibility will depend on the cultivar and the strain of *Verticillium* present in the soils.

FOR ADDITIONAL information on *Verticillium* Wilt refer to *Diseases of Trees and Shrubs* by W. A. Sinclair, H. H. Lyon, and W. J. Johnson. 1987. Cornell University Press. 574 p.

Master Gardener Matters

—October 21, 2009—

Bonnie Eisenberg was introduced as our new Coordinator—Barb Sallach has retired again. However, Barb still plans on doing the plant sales and the Farmer's Market tables. If you need to send a message to all Master Gardeners, Bonnie will now be distributing the general MG correspondence. Bonnie's email address is: mizbons@comcast.net.

❑ OLD, CONTINUING BUSINESS

MG Hotline—We have several spaces for interns to sign up for the hotline in November and December. If not enough interns sign up, it will be okay for additional certified MG's to sign up. **Reminder:** Our Hotline hours will change to the winter schedule of 9 am-noon in December, January & February. Hotline training for new interns will be held in January. Master Gardeners are welcome to attend for a refresher course. Be sure to report your Hotline hours as well as other volunteer hours every month. The MG Contact forms are available online (see Page 10 in this newsletter) or at the MG County Extension Office. Please leave your completed forms in the box outside our MG Office.

Newsletter—Ann Shine-Ring has assumed responsibility for updating our contact list, so let her know if you have any changes of information. Ann will also be distributing the monthly MG newsletter to all MG's and Interns. If you have ideas on articles for the newsletter or for future Plant-of-the-Month's, contact Ann at asring@hughes.net. The November newsletter should be sent out by Oct. 31st.

CoCoRAHS—Joan Lane mentioned that she receives a monthly newsletter from CoCoRAHS. If anyone is interested in also receiving it, let her know at mexlane@msn.com.

Web Page—Jan Brydon did not give a report, but Juliet mentioned that Jan could use some help if anyone is interested.

Other Information—Dee Davis brought tomato cages to give away. Also, Collette brought in several boxes of gardening and bird books to distribute to anyone interested.

Southern NM State Fair (Sept. 28–Oct. 4)—Val Fernandez thanked all the volunteers. She stated that having three judges this year was great. Val felt that there could have been better communication with growers to let them know about bringing their products to the fair for judging. Many fairgoers were very disappointed because the guy who had grown the huge 404 lbs. pumpkin could not get it into the building for display. Val reminded the volunteers who helped with the fair, to be sure to include those hours on their sign-in sheet.

Garden Expo—Ann Shine-Ring reported that there was good attendance on Saturday, but only a few people came on Sunday. She suggested that maybe we should just do one day next time. Many people who came on Saturday sat in on several sessions. Tom Packard and other presenters also said they had low attendance at their classes on Sunday. For the next time, perhaps we should consider having three workshops at a time but only on Saturday.

MG Plant Sale—Dixie mentioned that we made \$511 at the Sept. 26th plant sale.

Farmer's Market—Collette is doing the Farmers Market on Oct. 24th. She asked for more people to work on the weekend. Even though the City has moved the Market from the Mall, it is still pretty busy.

Marketing Committee—Val announced that the Committee is getting very close to having the MG brochure completed. She stated that some other marketing ideas are also being considered

Announcement—Sunday, Oct. 18th was Myles' birthday. We all sang "Happy Birthday" to him.

❑ NEW BUSINESS

Pecan Field Day (Nov. 4)—Joan Lane stated this event would be held at Leyendecker Research Center located on Highway 28 south of Avenida de Mesilla. She stated that the Salopeks have not requested volunteers this year, but we are invited to attend.

Education Program Committee: Juliet reported that Collette and Janie would like to retire from this Committee. We need at least two people to head up that Committee beginning in January. Joan Woodward and Mona Nelson volunteered. If anyone has suggestions on presentation topics, please forward your ideas to Joan Woodward and Mona. Our November education presenter will be John White. Our December Program will be a holiday potluck after our regular meeting. **For our December monthly meeting only, we will start our meeting at 10am with the holiday potluck to begin at 11am.**

Graduation/Awards Luncheon: To be held on Saturday, January 9th at Trails West. A catered lunch will be provided. More details will be discussed later.

January 20th MG Monthly Meeting: will include hotline training for new Interns and a refresher for certified Master Gardeners.

Other Announcements: Collette mentioned that the Chile Institute could use our help with its conference in Feb. 2010. There will be a cooking demonstration as well.

Master Gardener Matters-Continued

EDUCATION PRESENTATION—Kristee West presented “Growing Irises in the Desert” by Scarlett Ayers of the Mesilla Valley Iris Society (MVIS). The Program is available for viewing on the MVIS web site at www.zianet.com/mvis

Thanks to Ina Goldberg and Pam Crane for our Oct. 21st snacks. Our next meeting is Wednesday, November 18th.

Bonnie and Juliet



IMPORTANT: After our meeting, Jeff Anderson distributed a Customer Satisfaction Survey to us. A number of questions are listed, but #7 is of particular interest. The Doña Ana County Cooperative Extension is seriously considering possibly relocating our County Extension Office from 530 N. Church, Las Cruces to San Miguel, NM (13 miles south of Las Cruces) which may happen in the next year or so. This will impact our MG Hotline and possibly other volunteer activities. Please let your concerns be known by filling out the Survey. Copies are available at the County Extension Office.

Please note the open timeslots for Interns in November and December.
 (The Hotline assignments listed below were current as of 10/30/09)
 Certified Master Gardeners' names are shown in green

**Master Gardener Hotline Assignments for
NOVEMBER**

- Tuesday, Nov. 3 **Ina Goldberg**
Frank Collins (I)

- Friday, Nov. 6 **Leigh Matthewson**
Velina Hames (I)
Mike Smith (I)

- Tuesday, Nov. 10 **Alberta Morgan**
Janie Elliott
Mona Nelson (I)

- Friday, Nov. 13 **Pat Anderson**
Frank Collins (I)

- Tuesday, Nov. 17 **Linda Fredrickson**
Hope Movsesian (I)
Kelly Covert (I)

- Friday, Nov. 20 **Tom Packard**
Frank Collins (I)
Open _____ (I)

- Tuesday, Nov. 24 **Pam Crane**
Hope Movsesian (I)
Kelly Covert (I)

- Friday, Nov. 27 **Holiday**

**Master Gardener Hotline Assignments for
DECEMBER**

- Tuesday, Dec. 1 **Ina Goldberg**
Joan Woodward (I)
Open _____ (I)

- Friday, Dec. 4 **Pat Anderson**
Velina Hames (I)
Laurie Davidson (I)

- Tuesday, Dec. 8 **Pam Crane**
Hope Movsesian (I)
Kelly Covert (I)

- Friday, Dec. 11 **Katrin Sumpter**
Linda Fredrickson
Open _____ (I)

- Tuesday, Dec. 15 **Alberta Morgan**
Open _____ (I)
Open _____ (I)

- Friday, Dec. 18 **Leigh Matthewson**
Open _____ (I)
Open _____ (I)

- Tuesday, Dec. 22 **Kristee West**
Open _____ (I)
Open _____ (I)

- Friday, Dec. 25 **Holiday**

- Tuesday, Dec. 29 **Leigh Matthewson**
Open _____ (I)
Open _____ (I)

Next Monthly Meeting of the
 Doña Ana County Master Gardeners
 * * *
 Wednesday, November 18, 2009
 9-11am Cooperative Extension Office

**December 16th Meeting & Holiday Potluck Lunch to
 be held from 10am-12noon**

2010 MG's Graduation & Awards Ceremony
 Saturday, January 9, 2010 @ Trails West