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Petunia: Better Than Ever

Few other flowers are as synonymous with gardening as is petunia. A long-time favorite, petunia had the reputation of being available in a plethora of colors, relatively easy to grow, but not very heat tolerant. 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 “exotic” species. Recent work, however, has resulted in petunias the likes of which gardeners of yesteryear might not recognize because of improvements made in vigor, heat tolerance and overall garden performance.

Petunia is a member of the *Solanaceae* (or nightshade) family. This is a family that contains a few very sinister members such as deadly nightshade, angel’s trumpet and tobacco. In contrast, potato, tomato, pepper, and egg plant 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 are 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, does not fare well in the heat and humidity of a typical Missouri summer. This especially is true of the “older” cultivars that typically would go through a “summer swoon” at which time they were trimmed back severely to prepare them for renewed growth and bloom in the cooler months of fall.

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. Grandifloratypes 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 “breakthrough” in petunia breeding came with the introduction of the ‘Madness’ series in the 1970’s. 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 on factor which led

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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, many of which are vegetatively propagated. The 'Supertunia'® series was probably the first of the vegetatively-propagated petunias to hit the market and is part of the Proven Winners® collection of plants. They are very vigorous in growth habit and exhibit improved weather (heat) tolerance and abundance of blooms. It must be noted, however, vegetatively-propagated petunias usually are heavier feeders than common, seed-propagated types and must be fertilized accordingly. The 'Surfinia'® series of petunia is another Proven Winners® introduction which some consider to be an improvement over the Supertunias in growth habit and ease of culture. Other companies have followed suit and, today, names like 'Cascadia™', 'Sanguna™' and 'Suncatcher™' are commonplace in the bedding plant world. Most are either trademarked or plant patented by their developers.

In addition to the above, is the outstanding seed-propagated 'Wave'® series of petunia. Their spectacular garden performance makes 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'®, 'Easy Wavy'®, and 'Shock Wave'® are relatively new additions to the series; each has its own unique growth habit but all display superb garden performance. A final (relatively) new seed propagated series is the 'Morn' series which is a miniature (or "milliform") petunia. The series is characterized by compact plants with profusely-born small flowers displaying excellent weather tolerance.

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 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.

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Spring Lawn Care

Aeration, Fertility and Crabgrass Control

Early spring is an excellent time to give home lawns a jump-start with aeration and fertility. Cool-season grasses, such as bluegrass, fescue and ryegrass grow favorably during the cooler weather of spring and fall. Improving air, water and nutrient movement through the soil during this time significantly increases the quality of the grass.

Aeration reduces soil compaction, increases air exchange and allows water to infiltrate more quickly into the soil profile, therefore creating better root mass. Increasing root mass at this time of the year greatly improves the chances of cool-season grasses to reduce stress and survive the heat and drought of summer.

Aeration equipment can be found at local rental stores or garden centers. A machine that pulls a ½” diameter plug three to four inches deep on three to four inch centers will do an excellent job. Machines that force hollow tines into the soil are better than pull-type drums with spoon tines. Not all machines will meet these specifications; however any amount of aeration is better than no aeration.

Applications of fertilizer after aeration will move nutrients immediately into the root-zone of your lawn. This practice has shown excellent results in the density and color of cool-season turfgrasses in preparation for summer stress.

Fertilizer types available to homeowners come in a wide variety. Most are considered quick release forms, meaning they are readily soluble and immediately available to the plant. Any one of these would work for early spring applications. Applying ½ to ¾ pound of nitrogen per 1,000 square feet would be acceptable from early March to early April. All fertilizers sold over the counter will have recommendations for rate of application, usually based on square footage. In that case, it would be important to know the square footage of your home lawn and make sure the proper amount of fertilizer goes down per specified area.

When caring for your lawn and trying to keep it ‘weed-free’ the saying that “the best defense is a good offense” holds true. Weeds are opportunistic and invade weakened lawns, thus the best weapon to fight weeds

is a dense, healthy stand of grass. There are several good management practices that give lawns a fighting chance against weeds, such as planting the appropriate grass for a particular location, re-seeding bare areas in the fall, proper fertilizing, proper mowing (three to four inches tall) and proper watering. The height of mowing influences competition against weeds such as crabgrass - the higher the cut the lower the crabgrass infestation. Spring watering should not be a frequent practice if we have normal spring rains. Frequent light sprinkling encourages shallow-rooted weed seed germination.

Crabgrass is a summer annual grassy weed. It is a course, textured grass that germinates in the spring and grows well throughout the heat of the summer. Its wide leaf blades, heat tolerance, and prostrate growth habit make it an eyesore in the lawn and allow it to smother desirable turfgrasses. During the summer crabgrass will produce seed heads even at low mowing heights. Crabgrass plants will be killed by the first hard frost in the fall, and will drop their seed heads. In the spring, new crabgrass seedlings emerge around the previous year’s plants, unless this open space was over-seeded in the fall with a desired turfgrass or a pre-emergent herbicide is applied this spring.

Pre-emergent herbicides are so-named because they must be in place before crabgrass seedlings and other weeds begin to emerge. As a general rule, crabgrass may begin to germinate when daily high temperatures begin to reach 70 oF or above. In southern Missouri this may occur as early as mid-March; in central and northern Missouri this may not be until late March or early April. However, there are exceptions to this rule. Looking at this winter and spring being so mild, pre-emergence herbicides were being applied throughout March. Highest crabgrass emergence begins to occur as daily high temperatures reach 80 oF. A natural guide, specific to each year’s fluctuating weather patterns, is to have your pre-emergent herbicide in place before the yellow blooms of the Forsythia have all dropped. It is now the second week



Tall fescue lawn with excellent mowing height and density. Lawns of this quality will reduce annual weed populations up to 80 percent.



Lawn aeration will reduce soil compaction, and open the soil surface allowing air, water and nutrient to enter the root-zone.

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Crabgrass will emerge when five consecutive days reach 70 F. If pre-emergence applications were missed, early post-emergence application should be made to young crabgrass (left - 1 to 3 leaf stage). The plant on the right is in a 3 tiller stage.

of March and Forsythia are in bloom in central Missouri.

Most pre-emergent herbicides will not kill crabgrass that has already emerged. They must be applied and watered in to develop that herbicide barrier before weed seed germination. Many effective products are available, almost all of which are combinations of fertilizer with the pre-emergent herbicide (or crabgrass preventer).

Many over-the-counter products are available to you at several garden centers, hardware stores, farm centers and nurseries. Crabgrass preventers containing Dimension (dithiopyr), Pre-M (pendimethalin) or Barricade (proflam) are excellent choices for the control of crabgrass, other summer annual grassy weeds and some summer annual broadleaf weeds. Dimension is the only pre-emergence herbicide that offers some post-emergence activity as well. It works best if crabgrass is small (one to three leaf stage). If you missed the optimum time for pre-emergence applications, there are several post-emer-

gence products on the market today that are very effective. These new combination products will control young crabgrass and many broadleaf weeds. Quinclorac is the active ingredient for post crabgrass control and is usually in combination with 2,4-D, MCPP and/or dicamba.

Always read the label directions carefully when applying lawn care products. Do not over apply, either by excessive overlapping or applying more product than recommended to a specific area. Applying too much product could result in damage to turfgrass roots or other non-target plants. Determine the effective application width of your rotary spreader and space out each spreader pass to ensure uniform coverage with minimal overlap. It is also recommended to apply one-half of the rate required in two directions. This allows better distribution of the product and avoids striping. Do not spread crabgrass preventers into ornamental, flower or garden beds; they will restrict rooting of new plantings.

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Whoa Woodies!

Remember the Easter Freeze of 2007?

We Midwesterners have painful memories of the "Easter Freeze" of 2007, when temperatures suddenly flipped from 20 degrees F above normal in late March to 20 degrees below normal. Most trees and shrubs had significant new growth, with the cold hardiness of tomato plants, when the temperature plunged to the mid 20's for several days. Flowers and shoots turned to mush and there was significant damage to bark, leading to more dieback as the season progressed. Many of us are still pruning our Japanese maples to bring them back to their former glory. Unfortunately, the current season has, so far, set our woody companions up for a similar disaster.

Overall, the winter of 2011 has been mild, ranking in the top 5 mildest on record in Missouri. The foliage on the southern magnolias on MU campus is bright green, showing none of the browning that we see near the end of a more typical winter. However, since plant development is approximately two weeks ahead of normal, with above normal temperatures predicted over the next week, there is a high probability that we will see some damage before

we reach the frost free date in May. A quick review of weather extremes in Missouri reveals that we are, by no means, out of the wintery woods. On



Dead branch tips pruned from a Japanese maple in May 2007, following the Easter Freeze.

March 12, 1948 the minimum temperature was -4 F. In 1997, on the date of Easter for this year (April 8), the temperature dropped to 24. A similar temperature on Easter of 2012 for more than a few hours would cause serious injury to woody plants.

Woody plants have an amazing ability to tolerate temperature extremes if changes occur slowly. Even after

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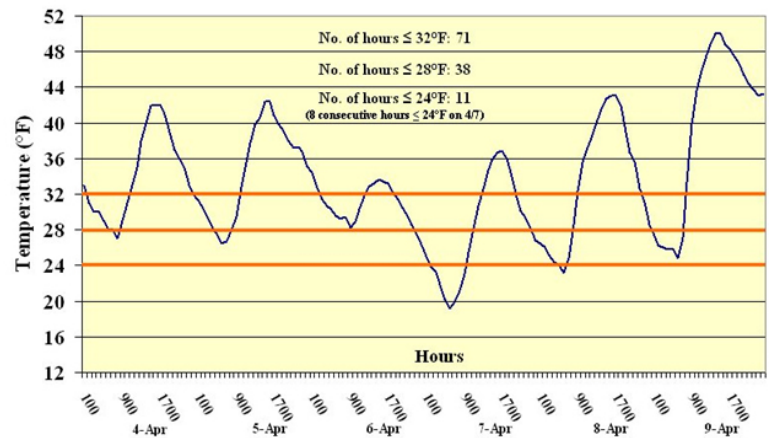
Whoa Woodies! Remember the Easter Freeze of 2007?

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our current warm spell, freeze damage from a cold period would be much less severe if we had gradual cooling to more normal temperatures before the freeze arrived. The good news is that trees and shrubs can usually recover from even severe freezing injury with good cultural practices like pruning, mulching, irrigation during drought and judicious fertilization (don't over-fertilize stressed plants). I would not, however, be sleeping very well if my livelihood depended on a crop of peaches. There may be slim pickings this year.

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Average Hourly Temperature at Columbia, MO
(April 4-9, 2007)



How to control moles and reduce turfgrass damage



Will they ever go away? It seems much worse this year than ever before and with the mild winter; did they ever hibernate? Most

individuals will say, "No". Feeding runways were observed being pushed up even under what snow we did get. As long as the soil remains wet and unfrozen, we will see activity.

Many turfgrass managers, gardeners and homeowners feel that the presence of moles is due to the presence of white grubs. Their first reaction is to apply a grub insecticide when mole activity begins in spring. While moles do feed on white grubs, grubs are not present at this time of year (late winter to early spring). Their primary food source is earthworms and many grub insecticides applied now, are known to reduce beneficial earthworm populations up to 70%. Mole activity decreases due only to the depletion of their primary food source, so they leave the

area. In time, earthworms and moles will return. Therefore, grub insecticides should not be used for mole control.

Most people have never seen a mole; however they are well aware of the damage caused to lawns and ornamental beds. Mounds of soil (molehills) and surface tunnels (feeding runways) are the common signs of mole presence. Learning to use repellents, traps, and baits and making use of a broom handle or similar stick can greatly reduce mole activity in as little as three hours. The following information will provide you the most efficient methods of mole control.

Moles live most of their life underground and are highly specialized animals for their subterranean way of life. The Eastern Mole is a small, sturdy animal, 5 1/2 to 8 inches long, with a somewhat cylindrical body and elongated head. The Eastern Mole is grayish-brown on the back to pale or more brown on the belly. Their velvety fur often has a silvery sheen. Occasionally bright orange or cinnamon-yellow marking will occur. Their fleshy snout serves as a highly sensitive organ of touch and smell to seek out numerous food sources. Their tiny eyes are concealed in fur and covered by fused eyelids; sight is limited to distinguishing light from dark. The greatly enlarged front feet are normally held with the soles vertical and pointing outward. They possess well-developed claws that have a specialized bone attached to the wrist, which aids in digging.

Moles construct networks of tunnels in the soil sur-



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face. Many of these are built after rains when the mole is in search of new sources of food and are usually not re-used from day to day. Digging of surface tunnels normally proceeds at a rate of 1 foot per minute. They tend to feed and rest on two-hour cycles, 24 hours a day. They are carnivores and living organisms constitute about 85 percent of their diet. This includes earthworms (their main source of water) and grubs, primarily; however millipedes, centipedes, spiders, sow bugs, snails and slugs are taken in considerable amounts. Moles are insatiable eaters and can consume 70 to 80 percent of their body weight daily. Moles generally move up or down within the soil profile to follow food sources such as earthworms, which move with soil moisture.

Moles also create mounds (called molehills) of soil in the lawn by pushing up soil developing deeper, permanent tunnels and nesting cavities. Mating occurs in the spring with a single annual litter of 2 to 5 young being produced in March, April or the first week of May. High infestations consist of 2 to 3 moles per acre.

Repellents usually contain castor bean oil as the active ingredient. Repellents need to be applied on a regular basis as a spray or granular application. They can be effective if application rates, frequency and techniques are strictly followed according to the label.



Several brands of mole repellents include Chase, Liquid Fence, Molemax, Mole Out, Mole Scram, and Scoot Mole. Trapping and baiting become the best methods for mole control due to the feeding habits of moles. Their frequent feeding activity allows for effective

trapping and baiting in just a few hours. The following steps will increase your success for controlling moles:

1. Use of a broom handle or similar stick to poke holes through the top of feeding tunnels at random throughout the tunnel network.

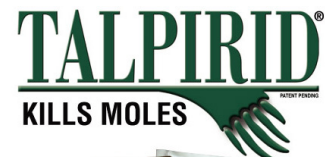
2. Re-visit those holes in two to three hours and inspect. A hole re-plugged with soil indicates a mole passed through that feeding tunnel making it an active feeding tunnel for that day. Not all feeding tunnels are used daily.

3. Set traps on or insert baits into active feeding tunnels. Use rubber gloves to set traps or insert baits to reduce human scent.

4. Continue to trap and bait until activity ceases. Controlling a few moles in an average size lawn (5000 square feet) will greatly reduce mole activity.

Effective traps include the "Easy Set" Mole Eliminator scissor trap, the "Victor" and "Sweeney" harpoon traps, and the "Nash" hoop trap. Available baits include Kaput Mole Control (syringe applicator), Moletox Baited Gel (syringe applicator), Talpirid (earthworm shaped bait), Motomco Mole Bait (earthworm and grub shaped baits), and TomCat Mole Killer (earthworm and grub shaped baits). Baits can be up to 95% effective if used correctly. Always wear latex gloves when handling traps and bait to avoid human scent contamination.

Keep in mind that moles are a perennial problem. When a void in the carrying capacity (number of moles a given areas can support) of a given area is realized, more moles will move in searching for earthworms and other insects. For this reason, trapping is the most economical method of mole control.



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April Gardening Calendar

Ornamentals

- **Weeks 1-4:** Study your landscape for gaps that could be nicely filled with bulbs. Mark these spots carefully and make a note to order bulbs next August.
- **Weeks 1-3:** Fertilize established roses once new growth is 2 inches long. Use a balanced formulation. Begin spraying to control black spot disease.
- **Weeks 1-2:** Examine shrubs for winter injury. Prune all dead and weakened wood.
- **Week 1:** Shrubs and trees best planted or transplanted in spring, rather than fall include butterfly bush, dogwood, Rose of Sharon, Black gum (Nyssa), vitex, red bud, magnolia, tulip poplar, birch, ginkgo, hawthorn and most oaks.

Lawns

- **Weeks 1-4:** Start mowing cool season grasses at recommended heights. For complete details, refer to University Extension Guide #6705, Cool Season Grasses.
- **Weeks 1-2:** Topdress low spots and finish over seeding thin or bare patches.
- **Weeks 1-2:** Aerate turf if thatch is heavy or if soil is compacted.
- **Weeks 1-2:** Apply crabgrass preventers before April 15. Do not apply to areas that will be seeded.

Vegetables

- **Weeks 1-3:** Finish transplanting broccoli, Brussels sprouts, cabbage, and cauliflower plants into the garden. High phosphorous fertilizers help get transplants off to a quick start.
- **Weeks 1-2:** Plants started indoors should be hardened off outdoors in cold frames before being transplanted into the garden.
- **Weeks 1-2:** Start cucumber, cantaloupe, summer squash, and watermelon seeds indoors in peat pots.
- **Weeks 1-2:** Asparagus and rhubarb harvests begin.
- **Weeks 2-4:** Try an early sowing of warm-season crops such as green beans, summer squash, sweet corn, New Zealand spinach and cucumbers.
- **Weeks 2-3:** Thin out crowded seedlings from early plantings of cool season crops such as beets, carrots, lettuce, onions and radish.

Fruits

- **Weeks 1-4:** Blemish-free fruits unmarred by insect or disease injury can rarely be produced without relying on regular applications of insecticides and fungicides. For special information, consult University Extension Guide Sheet #G6010, Home Fruit Spray Schedule.
- **Weeks 1-2:** Wooden clothespins make useful spreaders for training young fruit limbs. Place pins between the trunk and branch to force limbs outward at a 60 degree angle from the trunk.
- **Weeks 2-4:** Protect bees and other pollinating insects. Do not spray insecticides on fruit trees that are blooming.
- **Weeks 3-4:** Orange, jelly-like galls on cedar trees spread rust diseases to apples, crabapples and hawthorns.

Miscellaneous

- **Weeks 1-2:** Look for morel mushrooms when lilacs bloom and the forest floor turns green.
- **Week 1:** Mount a rain gauge on a post near the garden to keep track of precipitation so you can tell when to water. Most gardens need about 1 inch of rain per week between April and September.
- **Week 4:** Soaker hoses and drip irrigation systems help you save water and money.
- **Week 4:** Hummingbirds return from their winter home in Central America.
- **Week 4:** Wasp and hornet queens begin nesting.

Gardening Calendar supplied by the staff of the William T. Kemper Center for Home Gardening located at the Missouri Botanical Garden in St. Louis, Missouri. (www.GardeningHelp.org)