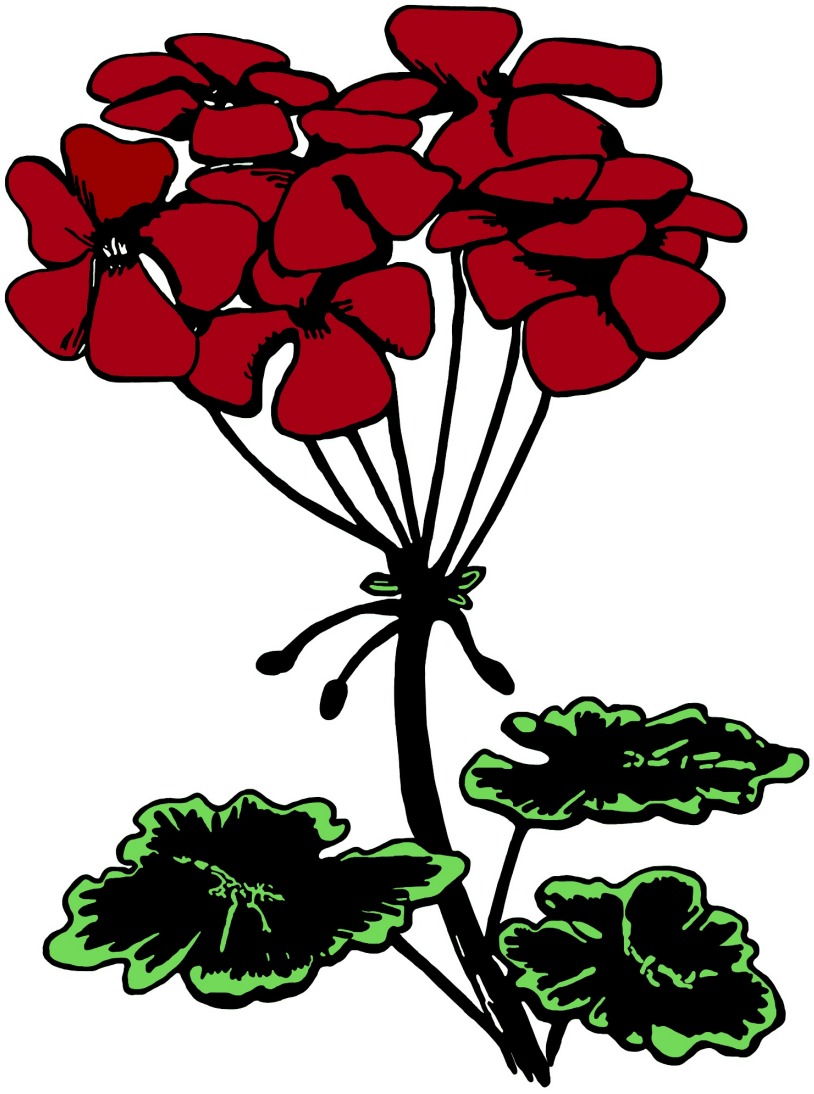
GERANIUMS



THE UNIVERSITY OF GEORGIA
COOPERATIVE EXTENSION
Colleges of Agricultural and Environmental Sciences & Family and Consumer Sciences

Table of Contents

Geraniums

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Geraniums are among the most popular flowering plants grown in the United States. They are easy to grow and can be used in many types of gardens such as ground beds, planter boxes, hanging baskets and pots. They are ideal for flanking entrance-ways and adding color to border plantings. They attract considerable attention when grown in containers on patios or in bal-cony gardens.

Potted geraniums have been popular holiday gift items for years, especially at Easter and on Mother's Day. Some species and varieties also make good indoor plants.

Types of Geraniums

The plants we commonly call "geraniums"are actually members of the genus *Pelargonium* (the true geraniums are quite different). The genus is large and diverse, with approximately 280 species. Although relatively few of these species are commonly cultivated, many varieties of certain species are commercially produced. Breeding efforts in the past few decades have resulted in the introduction of many new and superior varieties.

Common Geranium. Probably the most popular geraniums in the south are the common or zonal geraniums, *Pelargonium* x *hortorum*. Many of the varieties have distinct bands or zones of darker leaf pigments. Some of the fancy-leaved zonals have unusual leaf markings such as white borders or varied colors (tri-color geraniums). Flower color ranges from white to pink, rose, salmon and vivid red. The geranium flowerhead or cluster, which ranges in diameter from 3 to 6 inches, is made up of many individual flowers called "florets," which may be single or double.

Ivy-Leaved Geranium. Also popular are the ivy-leaved geraniums, Pelargonium peltatum. This species is trailing in habit and well adapted to window boxes and hanging baskets. Many varieties are available and range from lilac to pink to red. The flower clusters are typically somewhat smaller but are produced in profusion. The foliage is waxy, shiny and ivy-like in appearance. The ivy-leaved and zonal geraniums will grow in full sun given adequate moisture, but they generally benefit from light shade in mid-summer.

Martha Washington Geranium. The Martha Washington or Lady Washington geraniums, *Pelargonium* x *domesticum,* are frequently sold by florists as flowering pot plants during cooler seasons of the year. The plants are not particularly heat tolerant and typically do not perform as well outdoors in the south as the Common or Ivy-Leaved geraniums.

Species Geraniums. Many Pelargonium species and varieties are grown for their fragrant foliage and exotic leaf shapes. The flowers are typically small and are often inconspicuous. Lemon, rose, cinnamon, apple, orange and nutmeg are but a few of the scented types available. Most of these are grown as indoor plants and are sometimes used as culinary herbs.

Propagation of Geraniums

Most cultivated geraniums are tender perennials that are treated as annuals because it is easier to start new plants each spring than to carry over and invigorate old plants. Most geraniums root easily from stem cuttings, and many varieties must be vegetatively propagated to perpetuate desired characteristics such as flower color, scent and zonal pattern. In the past two decades, a number of seed propagated varieties have been introduced. Most geraniums sold as bedding plants are seed propagated.

Stem cuttings should be 3 to 4 inches long. Strip off the lower leaves and insert the stem about 1 inch deep in the rooting medium. Coarse sand works well as a rooting medium as do any other well-aerated mixes. The rooting medium can be placed in flats or pots. Rooting usually takes 3 to 4 weeks. During this time, provide indirect light and do not allow the cuttings to dry.

Seed propagation of geraniums is similar to that of other bedding plants. Geraniums germinate best at approximately 75 degrees F. The medium should be porous and sterile (the peat-like artificial soil mixes work well). Germination occurs in 7 to 10 days. Transplant seedlings to small containers as soon as they can be handled and begin light fertilization at this time.

Many home gardeners have neither the time nor the inclination to propagate their own plants, but commercial growers propagate cutting and seed-propagated geraniums. These are available throughout the spring and summer in a wide variety of colors in cell-packs and individual pots.

Geraniums in Flower Beds

Planting Time. Plant geraniums outdoors as soon as the danger of frost has passed. The plants should be grown or purchased in 3- to 4-inch pots and should be well branched.

Soil Preparation. Geraniums require good soil drainage and good soil aeration. Drainage and aeration of heavy clay soils, which are found in some parts of Georgia, can be improved by mixing perlite and organic matter into the soil. If perlite is not available, coarse sand can be substituted. Compost, leaf mold, ground bark, well-rotted manure and peat moss are ideal sources of organic matter.

Place 3 to 4 inches of a 50/50 mixture (by volume) or organic matter and perlite on top of the soil and mix into the soil to a depth of 8 to 10 inches. Incorporate fertilizer and lime at this time to provide the nutrients for good growth. A garden fertilizer such as 5-10-15 or 6-12-12 analysis applied at a rate of 2 to 3 pounds per 100 square feet (1 heaping teaspoonful per square foot) is recommended. Liming is beneficial if the pH of the soil is 5.5 (moderately acid) or below. Geraniums grow best in a mildly acidic soil (pH 6.5). A soil test is the only means of determining soil pH and the level of available plant nutrients. In the absence of a soil test, add 2½ pounds of dolomitic lime per 100 square feet (1 teaspoonful per square foot) to supply calcium and magnesium.

Sandy soils usually require addition of organic matter, fertilizer and lime. Organic matter improves aeration and the water-holding and nutrient-holding capacity of the soil. Mix a 2- to 3-inch layer of organic matter plus the recommended amount of fertilizer and lime (see recommendation from the soil test) into the soil to a depth of 8 to 10 inches.

Watering. Water small, potted geraniums prior to planting to wet the root ball thoroughly; water them again after planting to settle the soil around the roots. Never allow plants to wilt. If they wilt, the lower leaves will turn yellow and fall, so water the plants at least once each week when rainfall is not sufficient. Apply enough water to wet the soil to a depth of 10 to 12 inches. Water early enough in the day to allow leaves and blooms to dry before nightfall. This will help prevent disease problems.

Mulching. Plants benefit from mulches applied after the soil warms in the spring. A mulch will reduce high soil temperatures, prevent crusting, improve soil aeration and reduce weeds. A light mulch 1 to 2 inches deep is adequate.

Fertilizing. The key to continued geranium flowering throughout the summer is an adequate fertilization program. Apply fertilizer evenly around the plants and water into the soil to reduce the danger of soluble salt injury. An analysis such as 10-10-10 or 8-8-8 can be used at the rate of 2 pounds per 100 square feet (1 teaspoonful per square foot). Avoid putting fertilizer on the leaves or the stems of geraniums. Geraniums require fertilization every 4 to 6 weeks. Slow-release fertilizer reduces the need to fertilize so often.

Pots and Other Containers. Geraniums grown in pots, tubs or urns are ideal for outdoor use. They are often placed on a patio, near an entrance or on stairways and landings where they add interest, color and variety. Plants can be started outdoors after danger of frost has passed. In northern Georgia, where nights remain cool, plants should bloom from early spring until early fall. In south Georgia, blooming is best during the cooler part of spring, early summer and late fall. In the coastal area, fall growth and blooming can continue until January if the plants are protected from occasional frosty nights.

Properly sized pots are essential when growing geraniums. The ideal container size ranges from 8 to 12 inches in diameter, because containers of this size hold enough soil to support a good root system and enough water to prevent wilting during periods of hot weather. Plants might eventually need to be repotted in larger containers, depending on their growth. For example, geraniums purchased in 4-inch pots should not be transferred to pots larger than 6 to 7 inches. Geraniums purchased in 6-inch pots can be transferred to 8- or 10-inch pots. Small or young geraniums should remain in the same pot in which they were purchased until the roots begin to become potbound. Maintaining enough moisture in the pot is difficult after plants become slightly potbound, especially when temperatures are high and water loss is heavy due to a large number of leaves.

Potting Mixtures. Good water drainage is essential for potted geraniums to grow properly. If it important to select containers with adequate drainage holes and to prepare a suitable soil mixture. Garden soils often lack proper aeration and have a tendency to become

waterlogged when watered excessively. These soil conditions can lead to root rot and, consequently, poor growth.

When using clay soils, prepare a potting mixture containing equal parts of soil, peat moss and perlite by volume. If perlite is not available, builders' sand can be substituted. Leaf mold, ground pine bark or compost can be substituted for peat moss. In areas where sandy soils predominate, prepare a potting mixture containing three parts soil, two parts coarse peat moss and one part perlite by volume. In a 6-inch pot, mix ½ teaspoon of a complete garden fertilizer plus a level teaspoon of dolomitic limestone.

Artificial mixtures containing peat moss, vermiculite and perlite are used to grow geraniums. These mixtures usually contain some fertilizer and lime and occasionally contain pine bark. They are readily available and are often more convenient to use.

At potting time, place broken pieces of pots over the drainage holes in the container. This prevents roots from plugging the drainage hole and causing poor drainage and over-watering.

Watering. Geraniums do best when soil moisture is maintained evenly. To prevent moisture stress and slowed growth, water plants as the soil becomes dry to the touch. Apply water until soil is soaked thoroughly. Some water should drain out of the pot after watering to leach away excess fertilizer (called "soluble salts") and prevent any accumulation that can cause injury to small feeder roots.

Pot saucers are often used to prevent water from draining onto patio floors. This is a practical approach; however, water allowed to stand in the saucers prevents proper drainage and eventually leads to waterlogged soils. Roots fail to function properly under these conditions and are eventually lost due to root rot. An alternative approach is to use gravel in pot saucers and place the pot on top of the gravel. This allows proper drainage and prevents the soil in the bottom of the pot from becoming waterlogged.

Fertilizer. Liquid fertilizers are prepared by mixing a concentrated, dry, water-soluble or liquid fertilizer with water. Apply the solution around the plants when watering. Apply a liquid fertilizer at least once every three weeks. Liquid fertilizers vary in preparation; therefore, mix according to the directions given on the container. Dry garden-type fertilizers can also be used. Apply these once every three to four weeks at ½ level teaspoonful per 6-inch pot. Several slow-release fertilizers are also available.

Overwintering Geraniums

Cuttings. Some gardeners prefer to keep their geraniums from year to year. Cuttings taken in the early fall can carry over plants until spring. Rooted cuttings are potted and kept indoors in a window with a southern exposure.

Bareroot Storage. A very old method of carrying geraniums over winter is to dig them up, knock the dirt off the roots, and hang the plants upside-down in a cool, moist basement or similar area that does not freeze. Plants might need to be taken down periodically to soak the roots in water; this will prevent plants from drying out excessively.

In spring, take the plants down and remove ½ to ¾ of the top growth. Then place the plants in beds or repot them.

Potted Plants. Plants can be taken from the garden in the fall and planted in pots large enough to comfortably hold the root systems. Cut the top of the plant back to a height of not more than 6 inches and place it in a sunny window where the soil can be kept moist.

Those who grow only a few geraniums might prefer to discard their old geraniums in the fall and buy new, vigorous plants the following spring.

Diseases

A number of fungal, bacterial and viral diseases attack the roots, stems, foliage and/or flowers of geraniums. Many of these are of concern primarily to commercial propagators, so the home gardener has relatively few to deal with. Most can be controlled with proper pesticides. It is important to get a correct diagnosis, the select the appropriate pesticide. Your county extension agent can help you with the identification of insect and disease problems and recommend appropriate pesticides.

Botrytis. *Botrytis* Blight or Gray Mold is a common disease organism that lives on aging or decaying tissue such as flowers, leaves and broken stems. Under some conditions, it can also attack healthy tissue. During periods of high moisture, the affected portion might be covered with grayish-brown masses of spores. Various fungicides are available to prevent or control the disease. As with many plant diseases, good sanitation is important in control, so periodically remove and destroy dead leaves and old flowers.

Alternaria. *Alternaria* Leaf Spot begins with the appearance of small, raised blisters. Lesions develop around the blisters. The lesions increase in size and,

with severe infection, can grow together. Chlorosis occurs and, if the infection is extensive, severe leaf crop can occur. The disease can be controlled with fungicides.

Cottony Stem Rot. Cottony Stem Rot is caused by the fungus *Sclerotinia,* which causes a brown, moist decay of the stem and petioles. Cottony mycelium (threadlike filaments) appear on infected plants, followed by dark brown sclerotia (oval structures) at the nodes. Removal of infected plants is recommended in outdoor beds.

Blackleg. *Pythium* Blackleg occurs primarily during the propagation of geraniums, producing a slimy black rot that progresses rapidly up the stem. Home gardeners are not likely to encounter the disease unless propagating their own plants by cuttings, in which case they should be careful to select cuttings from healthy plants and to root the cuttings in sterile media.

Wilt. Vascular wilts of geraniums are caused by various organisms. Bacterial Blight, Southern Bacterial Wilt and Verticillium Wilt have all been reported. The symptoms are similar, usually beginning with wilting, yellowing and general stunting. Culture-indexing techniques by commercial propagators have eliminated most home garden wilt concerns. It is generally not possible to "cure" infected plants, so prompt removal of suspect plants is suggested. In the case of wilts and many other soil-borne diseases, it is not advisable to replant in the same beds year after year.

Viruses. A number of viruses cause various disorders in geraniums. Most have been eliminated through virus indexing and the production of virus-free organism stock plants in commercial propagation.

Oedema. Oedema (edema) sometimes appears on the undersurface of leaves, leaf petioles and stems as small pimple-like blisters. These small blisters enlarge and turn brown and corky as they heal. Oedema is a physiological disorder caused by high internal water pressure that causes cells to rupture. Oedema can be prevented by not watering the plants during cool, cloudy weather.

Insects

Mealybugs. Mealybugs can be a problem on geraniums. This soft-bodied scale insect injures geraniums by sucking the sap from the leaves and stems. They tend to occur in colonies and cover themselves with a white, waxy substance. When mature, mealybugs are about ¼ inch long. They are often found resting between the axil of the leaf and stem or on the backs of leaves. They secrete a honeydew on which sooty mold fungus thrives. To control small numbers of mealybugs, use a cotton swab immersed in alcohol to swab out the white web-like material that protects adults and their eggs. For control of larger infestations, it is necessary to spray with a recommended insecticide two or three times at 7- to 10-day intervals.

Whiteflies. Whiteflies can be found on the undersurface of geranium leaves, where they feed on the foliage with piercing and sucking mouthparts. Black, sooty mold fungus often grows on honeydew secreted by whiteflies. Symptoms of whiteflies include visual observation of this pest when foliage is brushed lightly and slight yellowing of the leaves. Small oval nymphs are found adhering to the under-surface of leaves. Adults are easily controlled with contact insecticides. Spray three or four times at 10- to 12-day intervals. If a heavy whitefly infestation occurs, spray four or five times at 5- to 7-day intervals.

Mites. Spotted mites are prevalent on geraniums during warm, dry weather, which favors their development. Mites cause injury by sucking plant juices. Foliage injured by mites has a mottled, bleached appearance, and plants make little growth. Mites are found on the undersurface of leaves, but they are hard to find because of their small size. When plants are heavily infested, fine silken webs can be detected. Miticides are most often used for control and might need to be used three or four times at 5- to 7-day intervals to be effective.

Cabbage Loopers. Cabbage loopers (some-times called inchworms) are small caterpillars that eat holes in leaves. They are usually found on the underside of the leaves they feed on. Spray plants with a recommended contact insecticide or use a biological control method. If a limited number of geraniums are affected, examine the plants carefully and pick off and destroy the small loopers.

Slugs and Snails. Slugs and snails feed on geranium foliage at night; they leave a trail of gray, slimy mucus on the leaves. Treat the plant around the base and beneath the foliage with a bait designed for these pests.

Reviving Neglected Geraniums

Growth and flowering of geraniums slows considerably during hot weather, especially in areas where night temperatures remain high. As this happens, plants are often neglected and have a very poor appearance. Insects and disease can contribute to the decline of

these plants, causing sparse foliage and lack of vigorous growth.

Plants with an unhealthy appearance can be encouraged to produce more vigorous stem growth, foliage and better blooms by pruning and attention to cultural practices. Prune back long stem growth in late summer (August), removing ½ to ¾ of the stem length. Make pruning cuts just above a node or joint on the stem. Fertilize plants at this time and at 3-week intervals thereafter to encourage root and stem growth. Light to moderate shade encourages additional growth. When nights become cooler (in late September or early October), provide full sun. Spray plants periodically with an insecticide and fungicide to protect the newly emerged foliage against insects and diseases. Remove flower buds 4 to 5 weeks after pruning to allow food reserves to be used for new growth. Following this method of treatment, plants should grow and flower well until they are killed by cold weather.

Popular Geranium Varieties

– Cutting Propagated –

ZONALS			
Red:			
Better Times	Empress	Magenta Ruby	Stadt Bern
Blaze	Empress Irene	Majestic	Starfire
Bolero	Fame	Mars	Star-Rubin
Cabaret	Fortuna	Mercury	Sunbelt Dark Red
Cardinal Red	Glacier Crimson	Mexico	Sunbelt Scarlet
Casino	Glacier Scarlet	Millie	Tango
Columbia	Goblin	Olymp	Treasure Chest
Coral Beauty	Grenchen	Penny	Vesuvius
Crimson Fire	Hildegaard	Polka	Volcano
Dark Red Irene	Improved Matador	Red Landry	Waltz
Disco	Improved Richard	Red Perfection	Your Truly
Electra	Irene	Sincerity	
Pink to Rose:			
Champagne	Genie	Promise	Springtime Irene
Cherry Blossom	Glacier Carmen	Rose Irene	Sunbelt Hot Pink
Didden's Imperial Picardy	Glacier Salmon	Rose Supreme	Sunbelt Rose
Eleanor	Madame Jaulin	Salmon Irene	Sunbelt Salmon
Fidello	Party Dress	Satellite	Tutti-Frutti
Fiedermaus	Penny	Schone Helena	Twist
Flirt	Pink Camellia	Shocking	Veronica
Gemini	Pink Flat	Springtime	Wendy Ann
Purple:	***White:***	***Orange:***	
Aurora	Bianca	Grandview Orange	
Blues	Modesty	Orangeade	
Flirtpel	Snowcap	Orange Richard	
Kardinal	Snowmass	Orangesonne	
Springfield Violet			

IVY-LEAVED			
Red:			
Balcon Royal	Firedragon	Mexicana	Scarlet Beauty
Burgundy Beauty	Grenchen	Peppermint Candy	Tavira
Carlos Uhden	Harvard	Red Mini Cascade	Yale
Decora Red	Intensity		
Purple:		***White:***	
Amethyst	Decora Lavender	Double Lilac White	
Barbary Coast	La France	Mrs. Banks	
Balcon Princess	Nutmeg Lavender	Snowdrift	
Bridesmaid	Patricia	Snow Queen	
Charles Monselet	Santa Paula		
Cornell			
Pink to Rose:			
Apricot Queen	Charles Turner	Hit Parade	Rigi
Balcon Imperial	Cindy	King of Balcon	Salmon Queen
Barbara Wirth	Decora Pink	Mary Lou	Sugar Baby
Beaute of Eastbourne	Galilee	Pink Queen	Sybil Holmes
SCENTED LEAVES			
Rose Geraniums:		***Special Purpose:***	
Lady Plymouth	Red Flowered Rose	Apricot	Rollisons Unique
Old Fashion Rose	Robers Lemon Rose	Clorinda	Schottesham Pet
Pel. Karooense	Silver-Leaf Rose	Fair Ellen Oak	Shrubland Rose
Peppermint Rose		Fern Leaf	Snowflake
		Mrs. Kingsley	Sweet Miriam
		Mrs. Taylor	Village Hill Oak
		Pheasants Foot	
Crispums and Crispum Types:		***Fragrans Varieties:***	***Fruit and Spice Scents:***
Prince Rupert		Nutmeg	Ginger
Strawberry		Snowy Nutmeg	Lemon Balm
Variegated		Variegated Frangrans	Lime
			Mabel Gray

Popular Geranium Varieties – Seed Propagated –			
(Zonal unless otherwise indicated)			
Red:			
Bright Eyes	Knockout	Pinto Red	Ringo Scarlet
Cherry Diamond	Mustang	Red Elite	Scarlet Diamond
Cherry Glow	Orbit Cardinal	Red Fountains	Smash Hit Red
Hollywood Red	Orbit Cherry	Ringo Deep Scarlet	Sprinter Scarlet
Jolly Red Giant	Orbit Red	Ringo Dolly	Steady Red
Jolly Red Wink	Orbit Scarlet		
Pink to Rose:			
Applause	Neon Rose	Orbit Salmon	Ringo Salmon
Cameo	New Diamond	Pinto Rose	Rose Diamond
Cherie	Orbit Appleblossom	Pinto Salmon	Smash Hit Dawn
Hollywood Salmon	Orbit Coral	Razzmatazz	Smash Hit Rose Pink
Hollywood Star	Orbit Deep Salmon	Ringo Light Salmon	Smash Hit Salmon
Jolly Appleblossom	Orbit Pink	Ringo Rose	
White:	***Violet:***	***Orange:***	***Ivy-Leaved:***
Hollywood White	Merlin	Orange Cascade	Summer Showers
Ice Queen	Orbit Orchard		
Orbit White	Orbit Violet		
Ringo White	Picasso		
Smash White			

Learning for Life

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