Camellia Culture for Home Gardeners

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Cooperative Extension Service
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CULTURE

Selecting Camellias

Select full, well-branched camellias for your landscape. Look for uniformly shaped plants with vigorous foliage. Avoid plants with heavy infestations of scale insects on stems or on the leaf undersurfaces. Avoid plants with cankers (sunken, discolored areas) on the stems.

Planting Location

Camellias grow best in year-round, semi-shaded areas. Those planted in full sun are less dormant during winter warm periods. Sudden temperature drops can cause severe flower bud and leaf injury. A planting site under tall pines or on the north side of a building provides more moderate growing conditions. An open southern exposure is the least desirable planting site, particularly in the northern half of Georgia (Figure 1).

Camellias do not tolerate poorly drained soils. Therefore, do not plant under drain spouts or in depressed areas where water collects. A gradual decline in plant vigor is usually associated with root system decline due to the soil or planting site.

Figure 1. *Moderate shade provides considerable winter protection to camellias.*

Varieties

Varieties are categorized according to color and hardiness. This list is by no means complete but represents many of the better varieties for Georgia.

RED	WHITE	PINK	VARIEGATED
Governor Mouton* (M)	Leucantha* (M)	Marjorie Magnificent	Donckelari*
R. L. Wheeler	September Morn (E)	C.M. Wilson (M)	Adolphe Audusson Var.*
Gulio Nuccio*	White Daikagura* (E)	Kumasaka*	Ville de Nantes* (M)
Professor Sergeant	Joshua Youtz	Dr. Tinsley*	Chandlei Elegans (M)
Mathotiana Supreme	Emmett Barnes (E)	Drama Girl	Lady Vansittart Var.
Victor Emanuel*	Alba Plena**	Berenice Boddy*	Daikagura* (E)
Lindsay Neill (M)	Snowman	Magnoliaeflora* (M)	Herme (M)
Arejishi*	White Empress*	High Hat* (E)	R. L. Wheeler Var.
Daikagura* (E)		Rev. John G. Drayton* (L)	Gulio Nuccio Var.*
Tomorrow**		Pink Champagne	Tricolor*
Rutledge Mimmix* (M)		Rose Dawn (M)	Betty Sheffield Supreme**
Flame		Lady Clare*	Lady Kay
Miss Charleston		Pink Perfection	Reg Ragland Var.
Mrs. Charles Cobb		Debutante	Kumasaka Var.
Firebrand*		Mrs. D. W. Davis	
		Lady Vansittart	
		Tiffany	

(L = late, M = mid-season, E = early)
* Varieties that produce cold-hardy flower buds. These varieties grow well in North Georgia.
** Camellias recommended only for South Georgia because of susceptibility to cold injury.

Planting Time

Plant camellias any time of the year as long as they are properly planted and tended. Balled-and-burlapped camellias transplant best during the dormant season, which is fall through spring. Planting dormant plants reduces the attention required. Soil moisture is usually adequate during the winter and the root system readily grows. When

spring arrives, the plant has a well-established root system able to support new growth.

Although container plants transplant easier during the dormant season, they can be planted during the warm months. Planting container stock minimizes transplanting shock because no roots are cut. If warm season planting is necessary, water the plants regularly and thoroughly.

Planting Procedure

When planting two or more camellias in an area, plant them in a well-prepared bed instead of individual holes. Cultivate the soil 8 to 10 inches deep to encourage root growth and establishment.

Camellias are shallow-rooted plants; therefore, good drainage is essential. When planting on poorly drained sites, raise the bed 10 to 12 inches above normal soil level. Use well-drained soil and shape the bed so that excess water drains out of it.

Plant camellias in holes at least two times wider and no deeper than the root ball. Remove all cords or wire and pull the burlap back from the top 8 to 10 inches of the ball. Place the plant in the hole so that the root ball is level with the soil surface. Backfill around the root ball with native soil after breaking apart clods and removing debris. Use your hand to firm the soil around the roots and then water to eliminate air pockets. Current research shows organic amendments are not essential in the planting hole. In fact, fine-textured amendments, such as peat moss and compost, are detrimental in certain soils.

You can use organic amendments on the soil surface. Place a 3-inch layer of organic mulch, such as pine straw, pine bark or well-rotted sawdust, on the soil surface to maintain uniform soil moisture and reduce weeds (Figure 2).

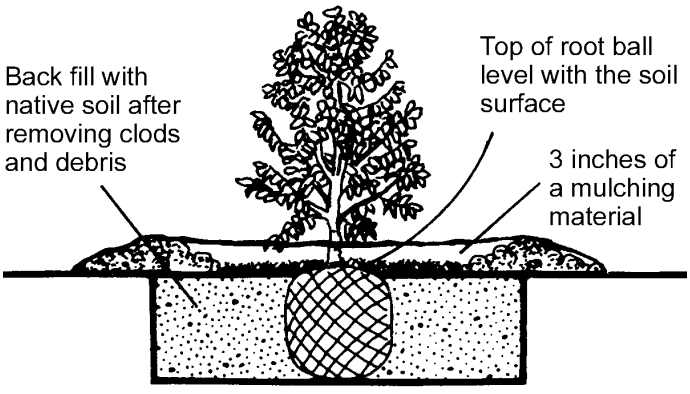

Figure 2. *Plant properly for a healthy beginning.*

Winter Protection

Covering a camellia plant provides frost protection but does little good in a severe freeze. If plants are covered with cloth, plastic or paper, prop up the cover so that it does not touch the buds. Put the cover on after the sun goes down and remove it before midmorning the next day.

Figure 3. *A semi-double variety (left) is not as susceptible to cold injury in the bud stage as a double flowering variety (right).*

There are additional approaches to providing winter protection against plant damage. Maintain good soil moisture, especially just before freezes. Maintain adequate nutrition by following current fertilizer recommendations. Plant in locations that provide moderate winter shade. Select varieties with good winter hardiness (Figure 3.)

Fertilization

Camellias do not require heavy applications of fertilizer. One level tablespoon per foot of plant height applied in March, May and July is usually sufficient. Spread the fertilizer evenly on the soil beneath the plant and extend it several inches beyond the drip line.

Camellia fertilizers are good but a general analysis such as 8-8-8 or 10-10-10 also gives satisfactory results. Only two applications (in March and July) are necessary when using a slow-release fertilizer.

Water in the fertilizer to increase its distribution into the soil. It is not necessary to remove the mulch before fertilizing if watered afterward.

Watering

Maintain vigorous camellias through proper watering. Because they have shallow root systems, camellias are susceptible to drought damage. Apply water slowly to get maximum soil penetration. Wet the soil to a depth of 15 to 18 inches. Rewater when the soil in the root zone begins to dry.

Water adequately the first summer after transplanting but be careful not to over-water camellias. Water once a week when rain is inadequate. Properly mulch camellias to conserve moisture.

Pruning

Homeowners seldom prune their camellias. While little pruning is necessary for compact-growing camellias, it is recommended on young plants that are not compact and is done in late May or early June. Pinch out the tips of vig-

orous shoots to stimulate branching. Remove terminal buds from vigorous shoots after they emerge in the spring. This forces the remaining buds into lateral branching, which helps the plant develop a nice limb structure.

Other pruning is done to control tea scale, which is the major problem associated with growing camellias. Severe infestations of tea scale, found on the underside of the leaves, causes defoliation and loss of plant vigor. Plants then become unattractive and fail to produce quality blooms.

Remove small nonflowering branches, 2 to 4 inches in length, growing on major limbs in the interior of the plant because they are a haven for scale. This reduces future numbers of scale and increases air circulation, which also helps prevent tea scale.

Spraying is essential for controlling scale; however, large overgrown camellias are difficult to spray. Consequently, homeowners neglect them, and scale becomes a problem. To combat this, drastically prune back overgrown plants (Figure 4). This removes the excess foliage and induces lower growth that is easily sprayed.

Prune overgrown plants in late winter. In southern Georgia, prune in late February to mid-March. In northern Georgia, prune in mid- to late March. Cut the plants back to 12 to 18 inches above ground, removing most limbs and all foliage. Plants cut back higher (2 to 2½ feet above ground) usually fail to fill out near the ground and are not as attractive as those pruned closer to the ground.

Sprouts will emerge from the trunk six to eight weeks after late winter pruning. These develop into vigorous shoots reaching 2 to 3 feet tall by midsummer (Figure 5).

New shoots usually are crowded and can be thinned in early to midsummer to encourage proper branching. Pinch them off as soon as they become 10 to 12 inches long to promote additional branching.

Good sanitation is important when you are pruning camellias. Wash or dip the saw in a mixture of one part bleach to nine parts water to disinfect the blade between cuts. Do not lay the saw on the ground because this can spread harmful organisms to the cut surface of the plant.

Figure 4. *Overgrown camellias can be severely pruned if done at the proper time.*

Figure 5. *Camellia growth in late September following heavy spring pruning*

DISEASES

The following are brief but informative descriptions of diseases that commonly occur on camellia. Plants grown under poor environmental conditions and improper horticultural practices are sensitive to disease infestation.

Root Rots

Several different fungi that infect and kill the fine feeder roots cause these diseases. Root diseases are associated with plants grown in poorly aerated or poorly drained soils; however, incidences have been found on plants grown under optimum conditions.

Figure 6. *Note the high percentage of dead feeder roots. Above-ground symptoms appear as nutrient deficiencies in leaves, marginal leaf burn, wilting and twig die-back.*

Plant response to root diseases resembles symptoms associated with iron deficiency, sunscald, fertilizer burn or "wet feet." Root diseases are progressive. As the fungus kills more of the feeder roots, you will see extensive plant wilting, twig die-back, leaf drop, overall plant decline or death (Figure 6).

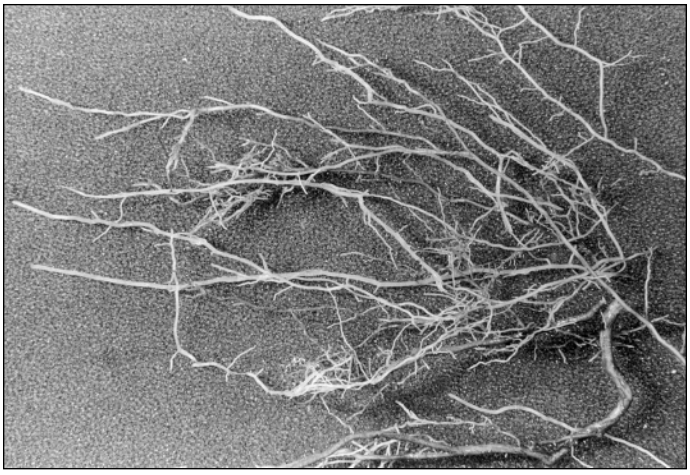

Figure 7. *Note the white, healthy feeder roots. Above ground, these plants have vigorous growth and rich, green foliage.*

When these symptoms appear, the disease is in advanced stages. Control measures at this time might not be effective.

Prevention is the best approach to control. Buy plants with white fleshy roots and healthy, vigorous tops (Figure 7). Use proper planting techniques and select a suitable site as previously described.

Flower Blight

The fungus *Sclerotinia camelliae* Hara causes flower blight of camellia (Figure 8).

Disease development requires cool, moist conditions in early spring just before or during early bloom. The disease first appears as small, water-soaked spots or as large, single, brown to tan areas in the flower center. During proper weather conditions the smaller spots rapidly expand to encompass most of the bloom. Petals are quite slimy to the touch. Flowers growing in the shade often become severely diseased because of the extended period of time that moisture is on the leaves. Initially, this disease mimics cold damage; however, cold damaged petals are not slimy.

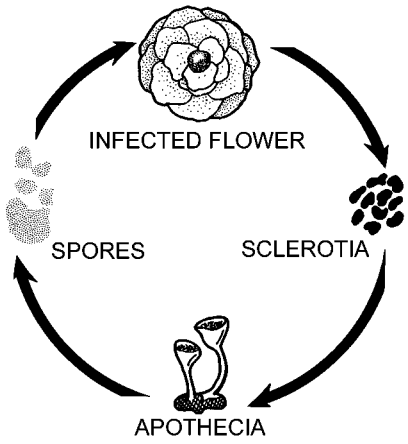

Figure 8. *Life cycle of the camellia flower blight fungus*

The fungus carries over to the next season on fallen, diseased blooms. Pick up all infected flowers and discard. Mulching, as well as spraying with a fungicide, is preventative maintenance.

Twig Die-back

Another disease, die-back, is sometimes associated with root rot because it mimics the root rot symptom. The die-back disease is caused by the fungus *Glomerella cingulata*. Infections occur through wounds or natural openings (leaf and petal scars and lenticels). Initially, die-back symptoms appear as small, dark sunken areas (cankers) on twigs and stems. As the canker enlarges, infected stems become girdled. Stems above this girdling progressively die causing leaves to wilt. Only individual twigs or stems are affected at first. Prune infected twigs and spray the plant with benomyl as the label indicates. Disinfect pruning shears with 70 percent rubbing alcohol when making the final cut. Then spray the pruned plant with fungicide.

Figure 9. *Camellia leaf gall causes large, thickened leaves on the terminal growth. Sasanqua camellias are more sensitive to this disease than japonica varieties.*

Leaf Gall

Leaf gall symptoms are characterized by thickened and enlarged leaves. To control, simply pick off infected leaves before they turn white. This practice reduces inoculum production, which is necessary for disease development in subsequent years. Sasanqua camellias are more susceptible to this disease than japonica varieties (Figure 9).

Viruses

Symptoms of viruses include a yellow mottling of the leaves and color variegation of the blooms (Figure 10). Such symptoms vary from year to year. Effects of the virus appear to be minor on the plant. Simple pruning of infected branches 3 or 4 inches below the symptoms is beneficial.

Figure 10. *A yellow mottling of terminal leaves is a symptom of a viral infection.*

Edema

Initially, symptoms appear as water-soaked spots on leaf undersurfaces but gradually change into brown, corky swellings. Such tissue is often referred to as excrescence. This condition appears to be physiological and not pathological (Figure 11). Moisture fluctuations are thought to cause edema. Poor soil drainage and excessive watering lead to this problem.

Figure 11. *The scabby-like projections on the camellia leaves are characteristic of edema. This condition is a physiological problem.*

Sunscald

This condition occurs on camellias transplanted from a shady to a full-sun environment. Areas of the leaf gradually turn brown. Plants under drought conditions or having poor root systems express similar symptoms. Avoid sunscald by establishing camellias in partial shade and maintaining adequate moisture during dry periods.

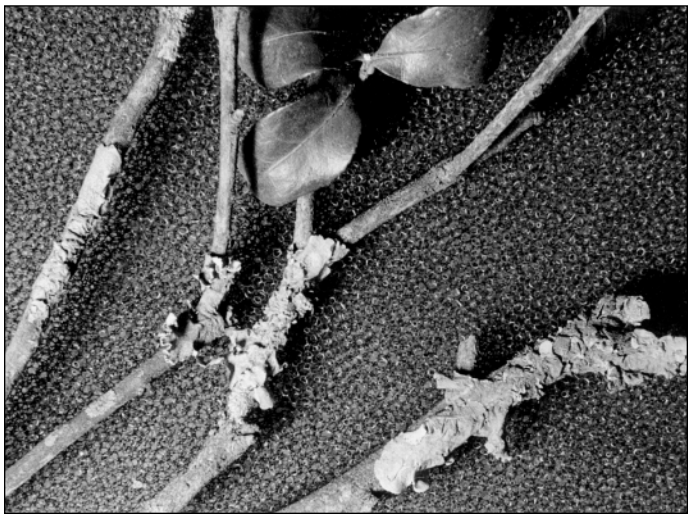

Figure 12. *Lichen growth on camellia stems often indicates a poor root environment.*

Lichens

A lichen is a symbiotic relationship between an alga and a fungus. Extensive lichen colonies on stems and branches indicate an unthrifty or slow-growing plant (Figure 12). Lichens are not parasitic and usually do no harm. To control lichens, improve plant maintenance.

Fertilizer Burn

Excessive and frequent fertilizer applications often devastate camellias. Too much fertilizer kills feeder roots, causing symptoms nearly identical to root rot disease. Initially leaf margins turn brown. If the situation is severe, entire leaves appear as if they were burned by fire. Stunting and even death can occur. Avoid over-fertilization by following the recommendations in this publication.

Sooty Mold

A thin black covering over the upper leaf surfaces characterizes sooty mold. Sooty mold is not a disease but is associated with insect infestations. Aphids, white flies and some scale insects secrete honeydew, which drops onto the leaf surfaces. The sooty mold fungi use honeydew as a food source. Sooty mold reduces the light intercepted by the leaf and weakens plants.

INSECTS

Two broad groups of insects and mites are pests of camellias. The first group causes damage by sucking juices from the plant. Scale insects, mealybugs, aphids and mites are examples of this type of pest. Symptoms include stunted plants, irregular growth, droopiness, discolored foliage and partial to complete defoliation. The second group causes damage by chewing on the plant. Infestation can cause a delay in blooming and a ragged appearance. Several weevils, beetles and crickets fall into this category.

Figure 13. *Tea scale is the most severe insect problem associated with camellias.*

Scale Insects

Scale insects are the most common and troublesome insects associated with camellias (Figure 13). Examples include tea scale, greedy scale, peony scale, oleander scale, wax scale and hemispherical scale. Scales vary in appearance according to species and sex. Their color ranges from white (many immature male scales are white) to brown or black. As scales mature, they develop a hard outer covering that protects them from contact insecticides, thereby making them difficult to control. Scales are most often found on the underside of leaves but can also be attached to stems. Symptoms of infestation include a yellowing of the upper leaf surface followed by leaf drop and twig die-back.

Mites

Spider mites are small and often difficult to detect on camellias. Place a piece of white paper or cloth under several leaves then tap the leaves to dislodge the mites. They can be seen moving around on the white background. Mite infested plants have foliage that appears dusty. When high populations of mites are present, you can see webbing on the surface of leaves.

Bud mites are also camellia pests. They are microscopic in size and feed at the base of flower buds. Infestation often results in distorted and poor-quality flowers.

Aphids

These small, soft-bodied insects are often called plant lice and are usually found along the stems of new growth or the underside of leaves. Symptoms of infestation include the curling of affected leaves and a sticky residue on the leaf surface.

Beetles and Weevils

The black vine weevil, Fuller rose beetle, *Rhadopterus picipes* (cranberry rootworm) and Japanese beetle are insects that damage camellia leaves. They chew circular or crescent-shaped holes in leaves causing the plant to look ragged.

Insect Control

Summer oils, or white oil emulsions, control scale insects, aphids and spider mites by enveloping them in a film that interferes with their respiration. However, these sprays can injure plants if temperatures are exceedingly hot or drop below freezing soon after application. Apply oil emulsion sprays in the spring and fall. Read the label of the product for restrictions on timing and application rate.

Systemic insecticides such as dimethoate (Cygon), acephate (Orthene) or Di-Syston control scale insects, aphids and several other pests. The plant absorbs these insecticides, which in turn controls feeding insects.

Contact insecticides include malathion, chlorpyrifos (Dursban), diazinon and carbaryl (Sevin). They are very effective and kill insects by direct contact during application or when pests contact a treated plant surface. Because their residual effectiveness is limited, repeat applications when pests reappear.

GRAFTING CAMELLIAS

Camellia plants that produce small inferior flowers or those more susceptible to cold injury can be grafted to correct these conditions.

Grafting unites a vigorous plant's root system (the understock) with a branch of the desired variety (the scion). After the graft takes, the scion grows rapidly. The cleft type of graft is commonly used with camellias and is perhaps the easiest of all the grafting methods.

The best time to graft camellias is in late winter, about four weeks before the foliage begins to grow. This allows the scion and understock time to unite before temperatures get high enough to stimulate new growth. February is a good month for camellia grafting in the Coastal Plain area. Late February and early March are good times to graft in the Piedmont area.

The Understock

Use vigorous varieties or seedlings of the japonica or sasanqua varieties as understock. Prepare the understock by pulling back the mulch and soil from the base of the plant. Cut the understock 1 to 2 inches above ground level (Figure 14). Make a smooth cut with a fine-tooth saw to prevent bark injury

The understock should be at least ½ inch in diameter. Grafting on smaller understock makes it more difficult to get the desired union. If the understock is less than 1½ inches in diameter, split it down the center about 1½ inches. Do this by tapping the upper surface of a sharp butcher knife with a hammer or mallet (Figure 15). Keep the blade clean and do not allow soil to get into the cut area (the cleft).

For understock more than 1½ inches in diameter, do not cut the cleft through the center of the stock. Instead, make the cuts ½ inch from the sides. A cleft in the center of large stock (more than 2 inches in diameter) puts too much pressure on the scion and forces it out of its proper position or crushes it. When cutting more than one cleft, make the cuts parallel (Figure 16). Place a nail in the center of the understock to reduce the pressure on the scions. Remove the nail after the graft has taken (Figure 17).

Figure 14. *Saw the understock carefully so that the bark remains attached to the wood.*

Figure 15. *A butcher knife and hammer are convenient tools for making a cleft in the understock.*

Figure 16. *Four scions are grafted onto this large understock.*

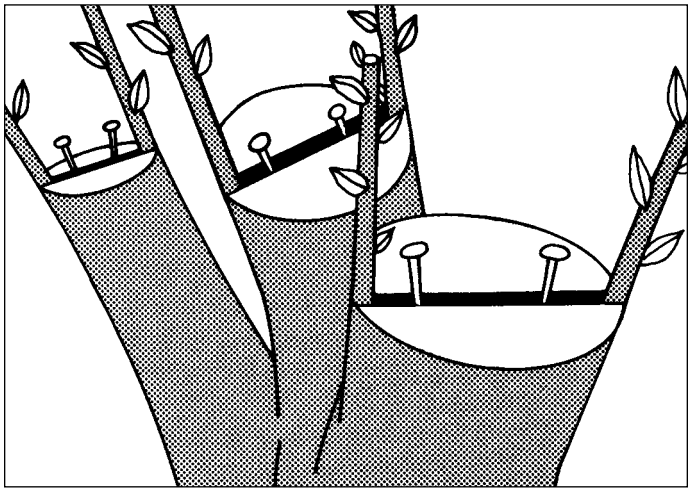

Figure 17. *Nails are used on this large understock to prevent scion crushing.*

The Scion

Take the scion from the dormant terminal growth of the desired variety. It should be 2 to 3 inches long and should contain one to three vegetative buds (Figure 18).

Remove all but two or three terminal leaves. Cut the base of the scion to a wedge-shape. Make the wedge one-sided, as shown in Figure 19.

Sharpen your knife just before cutting the scion. A dull knife invites poor results!

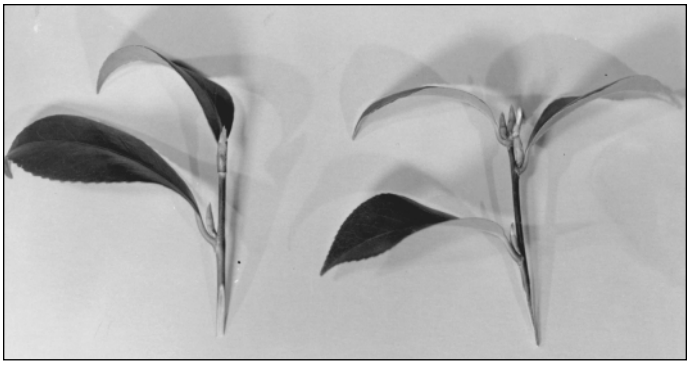

Figure 18. *The scion should be 2 to 3 inches long and contain one to three vegetative buds.*

Use this general guide for the number of scions to insert per understock: When the understock is below ¾ inch in diameter, use one scion; ¾ inch in diameter, use one scion; ¾ to 1 inch, use two scions; 1½ to 3 inches, use four scions; and above 3 inches, use six scions.

Store scion wood in a plastic bag and refrigerate if grafting cannot be done immediately after the scions are collected. Moisten the inside of the bag before putting the scion wood in it and seal the bag tightly. The scion should last two to three weeks when refrigerated.

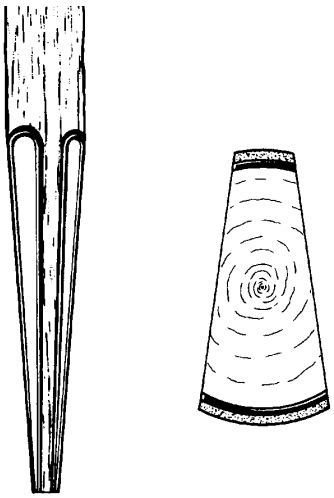

Figure 19. *A side and cross section view of a properly cut scion. Note that the cuts are smooth and even and that the base is slightly one-sided. The shading shows the location of the cambium cells.*

Before inserting the scion, force open the cleft by wedging a screwdriver into the center (Figure 20). Place a scion on each side of the cleft as illustrated (Figure 21). Do not allow the cut surface of the scion to dry out before insertion.

Figure 20. *Insert a screwdriver as a wedge to open the cleft for inserting the scions.*

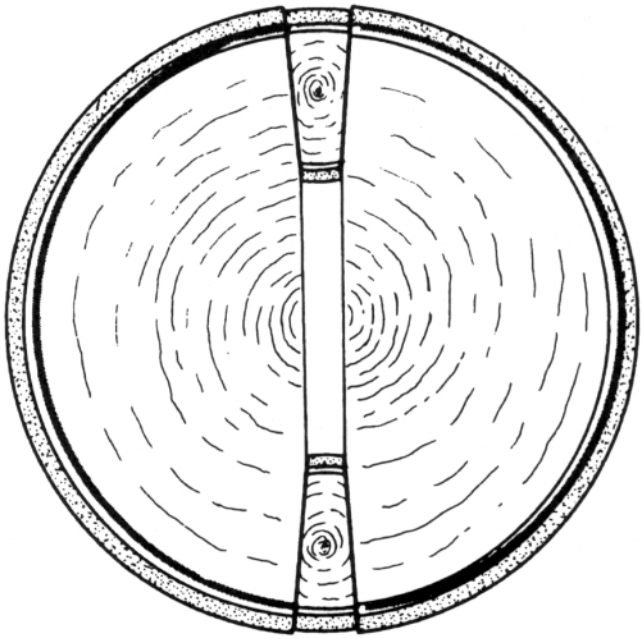

Figure 21. *Proper alignment of the scion and understock is essential for successful grafting. The shaded area is the cambium. Note that the cambium of the understock contacts with the cambium on one side of the scion.*

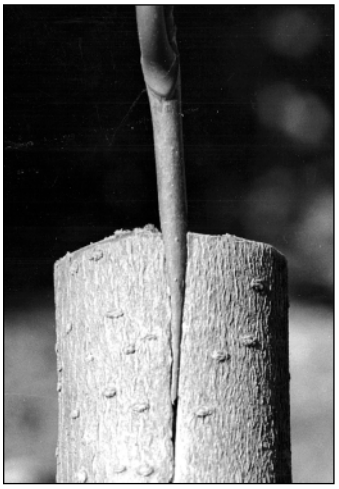

Figure 22. *The understock and scion must fit together perfectly for a successful union.*

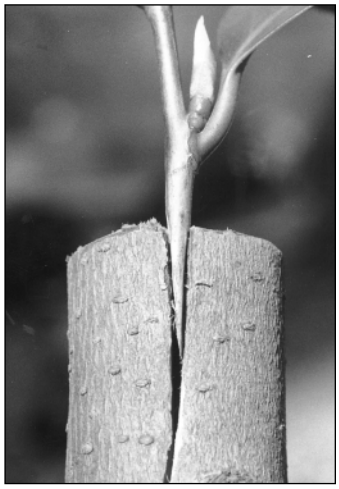

Figure 23. *Poor fit of the understock and scion results in graft failure. Recut the scion to match the understock.*

Figure 22 shows a good union of the cambium cells of the scion and understock. The union in Figure 23 will probably fail because the scion and understock are not in good contact.

Tie a rubber band around the stock if it is less than ¾ inch in diameter (Figure 24).

Small stocks do not exert enough pressure on the scions to hold them in place. Remove the rubber bands after the scions begin to grow.

Next, protect the graft union from moisture loss. A small handful of damp sphagnum moss tied around the graft union retains moisture. Grafting wax or static asphalt

Figure 24. *Note how the ends of the rubber band are secured without tying.*

Figure 25. *Asphalt tree wound compound or static asphalt protects the cut area.*

Figure 26. *High humidity is necessary when the graft union forms. Covering the graft with a glass jar causes moisture to collect.*

Figure 27. *A paper bag is a practical shade cover for the glass jar. Anchor the bag to the ground with soil.*

pruning compound painted over the grafted area also holds moisture in (Figure 25).

Mix 1 teaspoon of captan fungicide with each pint of asphalt to keep disease out of the cut areas.

Maintaining Humidity

High humidity around the graft is essential. Maintain humidity by covering the graft with a wide-mouth gallon jar. This causes moisture to collect inside the jar. (Figure 26).

Constructing a wire frame and covering it with a clear polyethylene bag is another way to maintain humidity. Seal the bag to the ground with soil to hold moisture in. Another method used is to place a large waxed paper cup over the graft. Anchor it to the ground with soil to maintain humidity and provide shading. When the new growth reaches the top of the cup, push out the top to allow the growth to come through the opening. Waxed paper cups allow enough sunlight to reach the graft. Do not use ordinary paper cups that will not let light inside.

Shade Cover

Glass jars and clear plastic covers result in a heat buildup around the plant which can kill the scion unless some type of shade is provided. Be sure to leave several inches open to the light on the north (shaded) side of the cover. Shade transparent covers with a square piece of burlap or paper grocery bag. Cut a 6-inch square window in the bag to let in light on the north side (Figure 27).

Hardening of Graft

Let air into the graft gradually when the new growth almost reaches the top of the jar. Tilt the jar or punch holes in the cup or bag. Then remove the glass or cover and allow the growth to harden under the shade.

Carefully water plants during new scion growth. Growth of 1 to 2 feet during the first growing season is common and on a large understock it may reach as much as 4 feet. When growth is rapid, prevent breakage by tying it to a stake.

Grafting Large Plants

Do not cut the plant off near ground level if it is very old. Instead, cut the top back to the lower limb system. Place a box around the trunk and fill it with soil or sand. Cut the branches off close to the soil level and make standard cleft grafts on each branch (Figure 28).

Figure 28. *Twelve scions were grafted on this large understock in February. This photograph was taken in October of the same year.*

Reducing Disease During Grafting

Graft failures are often caused by disease entering the cut surface of the understock or scion. The fungus *Glomerella cingulata*, which causes die-back disease, is the most common disease. It does not enter camellia plants until there is some type of wound. Consequently, grafting wounds offer an ideal place for this organism to enter. The disease is also favored by extremely rapid plant growth; therefore, growth is quite susceptible to die-back disease. Several procedures are effective in preventing disease. Use a fungicidal solution of 50 percent captan or 75 percent ferbam (Fermate) at 2 tablespoons per gallon of water. Then dip the trimmed scions in this for one to two minutes. Drench the entire graft area in the solution after inserting the scion to improve "takes."

Excess water also affects the vigor of recently grafted camellias. A common error, especially with container-grown camellias, is keeping the soil too wet before the graft begins vigorous growth. Insufficient soil drainage and a reduction in the plant's water use attract root-rot organisms that severely injure the root system. Improve soil drainage and aeration and reduce the watering frequency to meet the plant's needs.

Common Causes of Graft Failures

- Failure to have close contact between the scion and understock because of an improperly shaped scion wedge.
- Failure to align the cambium layers between the scion and understock.
- Hitting the scion in the process of covering the plant, thus changing the alignment.
- Poor sanitation which allows disease to enter the graft union.
- Failure to provide high humidity around the graft.
- Failure to shade the glass or plastic cover properly.
- Suddenly removing the glass or plastic cover without protecting the tender new growth.
- Incompatibility between the scion and the understock.
- Unhealthy stock or scion.

GIBBING CAMELLIAS

Camellia flowers are often disappointing when the plant has sustained winter injury. Hard winter freezes frequently injure *Camellia japonica* buds before they open. Also, many varieties flower in midwinter when there is the greatest danger of cold injury to the open blossoms.

Use a growth regulator, gibberellic acid, to speed up flower production and obtain blossoms before winter. This chemical allows many gardeners in North Georgia to grow flowers on plants that seldom produced good flowers.

Gibberellins are growth-regulating chemicals produced by most plants in very small quantities. The chemicals are prepared commercially from the rice fungus *Gibberella fujikuri*. The most commonly used gibberellin is gibberellic acid. The process of applying the chemical is often called "gibbing."

Gibberellic acid in a water solution is commercially available. For each flower, apply only one drop of the solution to stimulate it into production. Note in Figure 29 that the flower bud is plump and rounded while the vegetative bud is smaller and pointed. Begin treatment by twisting out the vegetative bud that is next to a well-developed flower bud (Figure 30).

This leaves a cup of bud scales at the base. Put a drop of the solution into this cup (Figure 31).

The chemical will translocate to the flower bud, which should begin noticeable growth within two weeks (Figure 32).

The time required for treated buds to flower is difficult to predict because variation occurs among varieties. Treatments made in September on early flowering vari-

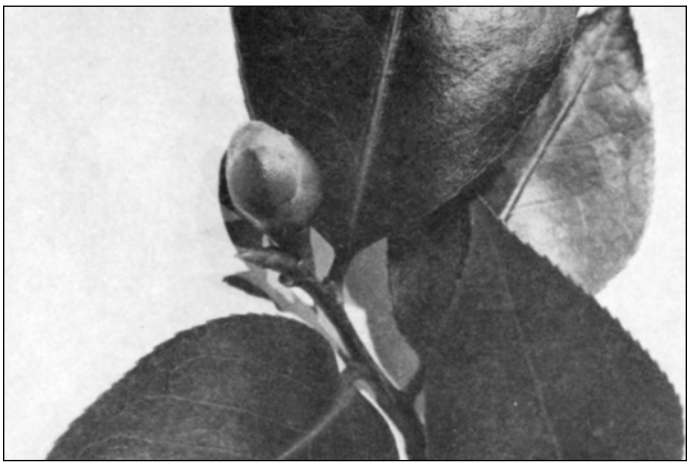

Figure 29. *Select a plump flower bud that has a vegetative bud next to it.*

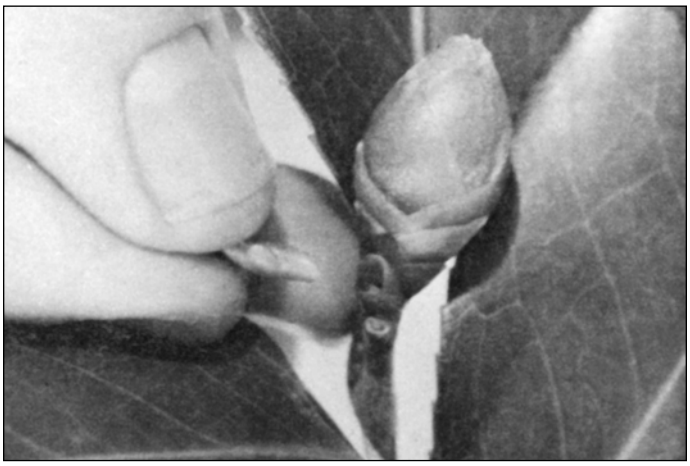

Figure 30. *Remove the vegetative bud with a twisting motion.*

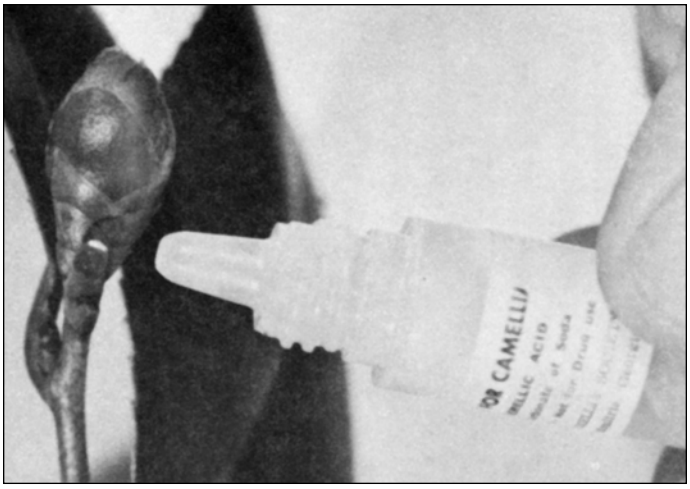

Figure 31. *Place only one drop of gibberellic acid in the vegetative bud cup.*

Figure 32. *An untreated bud is located on the left. The center bud was treated 10 days earlier. The bud on the right was treated 25 days earlier.*

eties can bloom within 30 days. Varieties that normally bloom late often require 60 to 90 days to open.

September and October applications are best. Apply gibberellic acid in early September for late-flowering varieties. On large plants, treat five to 10 buds each week to obtain flowers over a long period of time.

Prepared gibberellic acid solution is now available at many Georgia nurseries and garden centers. If unavailable locally, the American Camellia Society, P. O. Box 212, Fort Valley, GA 31030, can give you sources for the ready-to-use solution. This organization also has a list of sources for the crystalline material and instructions for preparing it.

Treat a large number of buds on mature camellia plants. Growers report treating 50 blossoms on large plants for three consecutive years without injury. However, defoliation and apparent injury were reported when all the buds on small plants were treated. On small plants only 2 to 3 feet tall, treat approximately one out of every five to 10 stems.

Terminal vegetative buds on treated stems usually fail to make normal growth in the spring; therefore, cut treated flowers for use in the home or prune the stems back later to the third or fourth vegetative bud.

In addition to early flowering, gibberellic acid treatment often results in a noticeable increase in flower size and quality. 5-inch gibbed flowers are not uncommon on some of the large flowering varieties. Growers find they can produce greenhouse-quality flowers on outdoor plants. Treated flowers remain on the plant longer than normal. Chemical treatment is most effective on healthy, vigorous plants.

Response to treatment varies considerably among camellia varieties. As a general rule, the early and mid-season varieties respond much better than late flowering varieties. A few do not respond by producing earlier flowers and some produce flowers that are quite different in petal formation from the normal blossoms. Some varieties have color variation, such as bleaching of the pink varieties and purpling of the normally red varieties.

The following varieties have reportedly responded well to the treatment:

- Arejishi
- Christine Lee
- Daikagura
- Debutante
- Dr. Tinsley
- Dr. W. G. Lee
- Eugenia Howell
- Flowerwood
- Herme
- High Hat
- Lady Vansittart
- Margaret Hertrich
- Martha Brice
- Mathotiana
- Mathotiana Supreme
- Morning Glow
- Mrs. Charles Cobb Var.
- Mrs. Josephine Hern
- Pink Perfection
- Pink Star
- Rev. John Drayton
- Rosea Superba
- Scented Treasure
- Tiffany
- White Giant

ATTENTION: PESTICIDE PRECAUTIONS

1. Observe all directions, restrictions and precautions on pesticide labels. It is dangerous, wasteful and illegal to do otherwise.
2. Store all pesticides in original containers with labels intact and behind locked doors.
3. Use pesticides at correct dosage and interval to avoid illegal residues or injury to plants and animals.
4. Apply pesticides carefully to avoid drift.
5. Use excess pesticides according to label directions. Follow label instructions for container disposal.

The University of Georgia and Ft. Valley State University, the U.S. Department of Agriculture and counties of the state cooperating. The Cooperative Extension Service, the University of Georgia College of Agricultural and Environmental Sciences offers educational programs, assistance and materials to all people without regard to race, color, national origin, age, sex or disability.

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Horticulture

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Gale A. Buchanan, Dean and Director