

PROPAGATION AND CARE OF LILACS

LILACS, though rugged and persistent under adverse conditions, will respond admirably to good culture. They thrive in a wide variety of soils in a pH range of 6.0 to 7.5 with preference for a well drained situation and full sun. They will not, however, tolerate wet locations.

In a remote section of the Arnold Arboretum there are two clumps of lilacs growing in a shallow pocket of rocky soil atop a pudding-stone ledge. Nearby are the remains of an old well, indicating that a dwelling existed at this location. It seems reasonable to suppose that these lilacs were planted by the occupants before the property was acquired by the Arboretum. If this assumption is correct, these plants have persisted under conditions of extreme adversity for over eighty years without attention.

Plate III depicts a thirty-five-year-old own-root lilac. By a program of systematic pruning, this multi-stemmed specimen is kept in a condition of constant self renewal. Each year or so a few of the older stems are removed to ground level and the new shoots are thinned and spaced to furnish future replacements. Should an occasional stem succumb to borers, which affect only the larger stems, the loss is of no great consequence. However, in the case of single-stem grafted plants it could result in complete loss. Another aspect of this pruning system is that better flower color and size are maintained. Lilac plants when permitted to attain large dimensions show a reduction in size of the flower and a lessening of its color intensity. For obvious reasons this method of lilac care is feasible only with specimens growing on their own roots. A good practice is to remove flower clusters after they have finished blooming. The nutritive materials which otherwise go into the formation of unwanted seed are thereby conserved for the plant. Lilacs which are not permitted to form seed, also flower more profusely the following year.

Plate IV shows a grafted plant of *Syringa vulgaris* 'Paul Thirion.' In one year this scion has developed sufficient roots to permit removal of the privet understock.

Plate V illustrates the incompatibility of lilac and privet by vigorous overgrowth of the scion. This one-year-old graft was planted with the union at ground level, giving the scion no opportunity to initiate its own roots. In a few years,



PLATE III

Thirty-five-year-old own-root lilac maintained in a condition of self renewal by a program of systematic pruning.

plants in this condition are inclined to display stunted growth and a starved appearance. These symptoms are usually followed by failure resulting from incompatibility of root stock and scion.

Plate VI shows a two-year-old *Syringa swegiflexa* which has reached a point of own-root development where the privet rootstock (indicated by arrow) is of no further consequence. In transplanting, it could be removed, but if disregarded, would undoubtedly perish of its own accord.

INSECTS AND DISEASES

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PLANTING

Planting of lilacs is best done in spring or fall while the plants are dormant. Fall has some advantage over spring, as root activity which occurs then establishes the plant for a good unchecked start with spring's arrival. However, container-grown and small plants will thrive if carefully moved with a ball of earth anytime throughout the summer and are given adequate aftercare.

As with all planting of trees and shrubs, the preparation of the hole to receive the plant cannot be overemphasized. A hole several times larger and deeper than the root system should be a minimum requirement. Careful preparation of the backfill is important, as once done, it becomes a permanent medium, out of sight, out of mind, and not changed again. Organic matter, such as rotted manure or compost, generously mixed with good soil provides a friable moisture-retaining medium that, with systematic fertilization and water, will serve the plant indefinitely.

An effort should be made to maintain the previous root level, easily determined by locating the line of demarcation on the lower stems, which indicates the parts previously above and below ground in the nursery. Planting too deep or too shallow will retard growth while the plant forms new roots at its own most favorable level.

A most satisfactory way to backfill is to bring well-firmed soil up to a depth equal to the lower level of the roots, place the plant in the hole with roots outspread in a natural manner, fill it with water and slowly add the prepared soil mixture. This method completely compacts soil around the roots, eliminating all possible air pockets without the root damage often involved as a result of firming by foot. Finally, a ring of earth around the outside edge of the hole forms a saucer which catches and prevents water from escaping. Mulching might be of benefit the first year while the plant is becoming established, but after that its value is dubious, as lilacs form superficial roots which would grow in the mulch, forming, in time, a troublesome water-shedding mound elevated above the surrounding terrain.

If the root system has been reduced excessively in the digging process, some reduction of the top becomes necessary in an effort to balance top to root. An



PLATE IV

Arrow indicates roots which this lilac scion has developed in one year.

important point to be considered when arriving at this balance is the fact that excessive pruning reduces any plant's digestive and respiratory facilities, often to the point of serious retardation.

SOFTWOOD CUTTINGS

Softwood cuttings are perhaps the most satisfactory way of increasing lilacs. With some exceptions, they are ready for potting in about seven weeks, producing own-root plants not subject to the complications often encountered with grafts.

With the advent of mist systems and moisture retaining plastic case coverings, collection of lilac cuttings no longer requires the critical timing once necessary. Propagators previously determined "proper time" by flexing the cutting between their fingers; the rule-of-thumb method being to take material when the wood reached a point where it snapped instead of collapsing when sharply bent. Through trial and error, cuttings at this stage of lignification were found to root best. However, with modern facilities this time has been advanced and we now succeed with softer material taken when it reaches sufficient size to make a cutting. We have found, however, that wood taken too late will sit in the propagating cases for weeks on end, rooting in mediocre percentages or petering out entirely.

In selecting lilac cuttings, vigorous shoots with long internodes are avoided and only normal growth is chosen. An effort is made to gather the cuttings early in the morning before much transpiration has taken place and the wood is in its freshest and most turgid condition. Material collected in this manner and placed in closed bags, shielded from the sun, will be in prime condition. In the event that insertion cannot be made on the day of collection, the closed bags may be stored in a refrigerator at about 40° F. for several days without deterioration.

At the Arnold Arboretum cases are used composed of 2 mil. polyethelene plastic film supported on a framework of welded joint wire of 2x4 inch mesh, known as turkey or utility wire. Bottom heat is maintained at 75° F. by electric heating units. Shading is accomplished by roll type shades on the greenhouse, supplemented at midday for about two months, when the sun is at its highest, with additional shading of saran cloth hung two feet over the propagating case. This shading is timed to reduce the build-up of trapped heat in the cases with the least reduction of light intensity.

Treatment of softwood lilac cuttings is in the following manner: An oblique cut is made slightly below the nodes and the bottom pair of leaves are removed. If the tip is soft and rubbery, this too is nipped off, as it might decompose in the case inviting fungus infection. Cutting bases are dipped in Hormodin #3, which is composed of 8 milligrams of indolebutyric acid to 1 gram of talc, and are then tapped to remove any surplus. The medium to receive these is washed sand purchased from a local gravel pit. Though finer in particle size and not as sharp as we would prefer, it serves the purpose. Cuttings are inserted to a depth of about one and one half inches in rows, spaced so as not to touch one another. A very

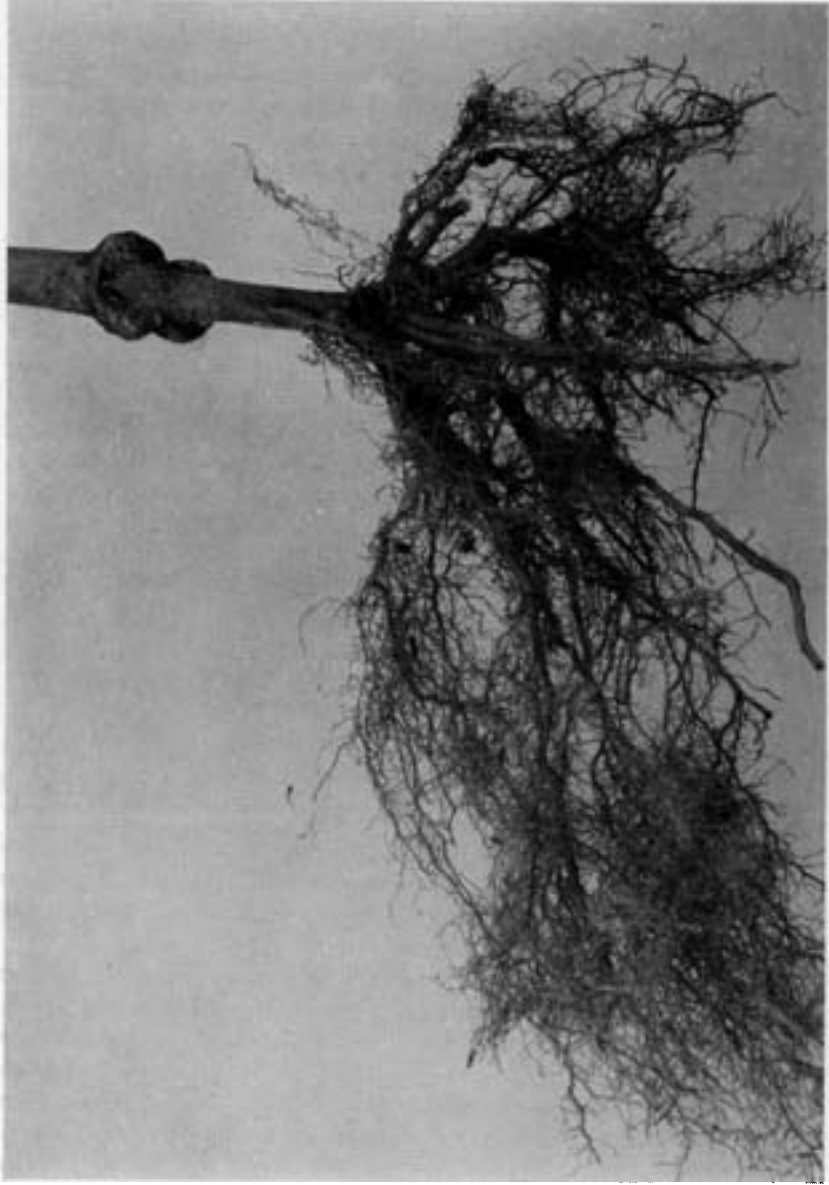


PLATE V

Incompatibility of lilac and privet is depicted by overgrowth of the scion. Had the union been planted deeper the scion might have initiated roots.

thorough soaking at this time compacts the medium around the cuttings and constitutes the initial watering. Finally, the polyethelene covers are placed over the cuttings, making certain that they are airtight. Success with this method of propagation depends completely on how well the cuttings are covered, as air leaks on dry days can reduce the necessary high humidity, causing failure.

On cloudy, humid days all coverings are removed as routine procedure and the cases are checked for fallen leaves and dead cuttings, which are removed as a sanitary measure. Should the day remain close and humid, the coverings are left off all day. Before again covering the cuttings at night, a spray application of 50% "Captan" at the rate of two teaspoons to the gallon of water is made.

An inspection every few days reveals whether or not the medium is drying out, fungus infection is occurring, or insects have hatched from unnoticed egg masses which may have entered the case on cuttings.

When properly timed, treated, and handled, the lilacs are ready for potting in about seven weeks. After potting or boxing, material rooted under these humid conditions must be converted to greenhouse atmosphere in a gradual manner. This is accomplished by again covering them with polyethelene film. On cloudy, humid days it can be completely removed, and after several such days occur in succession, the transition will be complete. Otherwise, uncovering at night and covering in the morning, gradually increasing the uncovered period, will accomplish this very necessary conditioning.

HARDWOOD CUTTINGS

Lilacs can be rooted from winter cuttings, but so slowly and in such small percentages that this method seems unworthy of consideration.

LAYERS AND DIVISIONS

These methods which are applied to a limited extent commercially provide a simple means by which an amateur can increase his lilacs.

On observing lilacs, many plants can be seen with sections that can be separated from the parent plant with a spade. Divisions of this kind, can, with a minimum of attention, become flowering specimens in a few years.

Layering is performed by bending a branch down into a small trench about 3 or 4 inches deep and securing it about 12 to 15 inches back from the tip with a forked stick, bent wire or any means that will hold it in place. Shaving the rind from the under side for a distance of several inches at the point where it is pegged, will stimulate cell activity and aid in inducing roots. Next, the soil is replaced, the tip is bent upright and preferably staked. Should the soil be of too heavy a texture, a medium composed of two parts sand, one part peat and one part soil is substituted. If done in the early spring and kept moist, the layer might have a root system adequate to permit severance from the mother plant after one grow-



PLATE VI

Scion of this two-year-old lilac-privet graft has developed roots to an extent where the privet is of no consequence. Arrow indicates proportionately small remaining understock with dead stubs at its base.

ing season, but it is more apt to require two. This can be easily determined by carefully removing enough earth to observe the size of the root system.

SEED

Seeds have a dormant condition that can be overcome by a period of cold stratification. This is accomplished by storage in a refrigerator at approximately 40° F. for one to three months in a polyethylene bag with a slightly moistened medium of sand and peat, or by fall sowing out-of-doors. We favor the former method, as it obviates the necessity of having to furnish protection from the destructive action of vermin. Species lilacs will come true from seed if they are not grown in the proximity of others where cross pollination might occur. Cultivars will not produce true types from seed.

GRAFTING

As with all our lilac propagation, we approach grafting in an attempt to obtain own-root specimens free of the troubles which often beset grafted plants. Understocks are considered as temporary, to function only until the scion has developed a root system sufficient for its own support.

Bud grafting has the disadvantage of buds being placed high on the stock, making it extremely difficult, if not impossible, to plant deep enough to induce the scion to initiate its own roots. We do this, on occasion, as a temporary measure to carry material received too late in the season for cuttings, but only with the intention of repropagating, preferably by cuttings, as soon as possible. This temporary storage of material can be done on any lilac or privet available in the nursery.

Use of *Syringa vulgaris* as a rootstock meets with immediate objection because of its treachery. Most lilacs by nature spread vigorously from suckers and this understock could, unless carefully watched, easily outgrow the scion without ever being noticed.

In the climate of Boston, *Ligustrum ovalifolium* qualifies as suitable understock for this method of producing own-root lilacs. The past winter in this area was one of persistently low temperatures, without snow cover, causing abnormally deep frost and extensive damage to plants. However, on digging several hundred lilacs grafted on *L. ovalifolium* this spring, no injury to the stock was observed. One-year-old rooted hardwood cuttings of *L. ovalifolium* are obtained from nurseries which mass produce them at a cost making it more practical to purchase than to raise them. Storage is achieved by heeling in out-of-doors in a deep frame, cold enough to keep them dormant yet warm enough to prevent freezing of the ground, so they will be readily available when needed.

Scions may be collected anytime throughout the winter as they are to be used, or can be stored in tightly-closed polyethylene bags with a small amount of slightly-moistened sphagnum moss at about 40° F. in a refrigerator. Scions are

maintained in a condition as fresh as possible; this method preserves them for many months in a state comparable to newly cut material.

A whip-and-tongue graft is made using a scion about 6 or 7 inches long and an understock perhaps $1\frac{1}{2}$ inches in length. Rootstocks are kept short to facilitate the deep planting imperative with this method. Completed grafts are bound with rubber budding bands and then are placed deep enough to conceal the union in a moistened medium such as sphagnum moss, peat moss or sawdust. This procedure, known as callusing, can be controlled with a variance of temperature. Should a fast knitting of the union be desired, a temperature of 70° F. would create it in ten days. Grafts made early in the season can be callused slowly at lower temperatures. For example, grafts done in January would require about eight weeks to knit at 40° F. Once callused, they are kept cold enough to prevent further development until planting time.

In spring, when the ground warms up and the nursery becomes workable, the soil is prepared with a rotary hoe set at its greatest depth to facilitate deep planting. Budding bands are removed and the grafted plants set in rows spaced a foot apart with unions buried to a depth of about four inches. As with softwood lilac cuttings, grafts too will show variable results. Many grafted scions form roots quickly, some do so slowly and others resist.

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PLANT COLLECTING IN THE SOUTHEASTERN UNITED STATES

Dr. Kenneth A. Wilson and the writer have recently returned from a month-long, 4000-mile trip involving collecting and field studies in connection with work toward a flora of the southeastern United States. In the course of this travel, areas in Tennessee, Alabama, Florida, Georgia, and South and North Carolina were visited, herbarium specimens and specimens preserved in alcohol were collected, and a number of living plants were sent to the Arnold Arboretum to be added to the numerous southern plants in the living collections. Among the plants collected for trial are clones of *Liriodendron*, *Calycanthus*, *Philadelphus*, *Malus*, *Amelanchier*, *Robinia*, *Lonicera*, and *Diervilla*, mostly from northeastern Alabama, an area of particular interest to plant geographers. Lying as it does at the southern end of the Appalachian system in an area of moderate climates and with a diversity of habitats, this region has an accumulation of a number of interesting and rare plants. Without trial it is often quite impossible to predict whether or