

PROPAGATION OF HYBRID LILACS FROM CUTTINGS

HENRY KIRKPATRICK

Boyce Thompson Institute for Plant Research, Inc.
Yonkers 3, N.Y.

French hybrid lilacs, *Syringa vulgaris* vars., can be successfully propagated by cuttings. Considerable work was done at the Boyce Thompson Institute for Plant Research, Inc., from 1937 through 1942 on the propagation of hybrid lilacs, and preliminary results of this work were published in April, 1939 (1). Later work substantiated these results and indicated that from 75 to 100 per cent rooting could be obtained. Twenty-four varieties of the hybrid lilacs were successfully propagated from cuttings (Table I), and no significant differences were noted in the rooting responses of the different varieties. Rooting occurred in from four to five weeks, and the cuttings were ready for potting in approximately two months. Rooted cuttings grew and developed normally.

Propagating methods involved the use of open benches in paint-shaded greenhouses where a minimum temperature of 68° F. was maintained. Temperatures lower than 68° F. inactivated or noticeably reduced the effectiveness of the root-inducing substances. A rooting medium consisting of a mixture of sand and peat moss was found to be satisfactory. The medium was placed in the benches without tamping or packing. After treatment the cuttings were planted on a 30-to 40-degree slant so that the leaves lay flat on or close to the surface of the rooting medium.

Immediately after planting the cuttings were heavily watered to firm them in, then shaded with a single layer of cheesecloth placed directly on the cuttings. The cheesecloth was removed for watering, then permanently removed after the cuttings had been in the bench for three weeks. Cuttings were taken periodically throughout the year

TABLE I—Rooting Response of Cuttings of SYRINGA VULGARIS Varieties One Month after Treatment with 8 to 12 Mg. of Indolebutyric Acid in Talc

Variety	Date cuttings	Per cent rooting	Variety	Date cuttings	Per cent rooting
Adelaide Dunbar	5/11	75	Elihu Root	5/21	75
Amethyst	5/27	75	Mme Florent Stepman	5/3	100
Antoine Buchner	5/11	75	Oliver de Series	5/18	75
Arthur Wm Paul	5/19	100	Paul Thirion	5/21	100
Capt Baltet	5/20	100	Perle von Teltow	5/16	100
Charles Joly	5/20	100	Pres Lincoln	5/14	75
Christophe Colombe	5/27	100	Pres Poincare	5/3	75
Clara Cochet	5/19	75	Prof Sargent	4/27	100
Comte Adrian de Montebello	5/14	75	Reine Elizabeth	5/19	100
Dame Blanche	5/15	100	Rubella plena	5/20	75
Decaisne	5/9	100	Siebold	5/18	100
Duc de Massa	4/29	75	Toussaint Louverture	5/18	100

and various types of cuttings, including complete shoots cut through the annual ring, tip portions of long shoots, and basal portions of long shoots, were used in the tests. Indolebutyric acid (IBA) and α -naphthaleneacetic acid (NAA), alone and in 50-50 mixtures, were used in a range of concentrations, and the chemicals were applied to the cuttings by the 24-hour solution soaking method, by the talc powder method, and by the concentrated dip method. Treatments found to be effective were repeated for at least three years to substantiate results.

Three types of peat moss, including German, Canadian, and Michigan, were tested to determine the best type to use in the rooting medium. Little or no differences were noted in the induced rooting responses in the different media, but root growth and development appeared better in the mixture containing the German peat moss. A mixture containing $\frac{1}{4}$ to $\frac{1}{3}$ peat moss and $\frac{3}{4}$ to $\frac{2}{3}$ sand by volume was found to be satisfactory. Larger amounts of peat moss increased the possibility of overwatering and resulted in more basal rot on the young succulent cutting material. A sharp sand provided better drainage and aeration than a fine silty type of sand. The peat moss should be finely broken and well moistened before mixing with the sand.

The three more important factors influencing the rooting response of the hybrid lilacs were found to be the stage of growth or time at which the cuttings were taken, the type of cutting used, and the chemical treatment. The critical time period for taking the cuttings was found to be early in the spring when the new growth had reached a length of four to six inches but before the stem had become hard and woody. This time period cannot be dated and varies with local environmental conditions affecting growth. In the Yonkers, New York, area this time period is usually the month of May. Cuttings taken after the end of May periodically throughout the summer and fall showed progressively poorer rooting as the growth matured. Dormant cuttings callused but failed to produce roots.

The best type of cutting material was found to be complete shoots, four to six inches in length, cut through the annual ring. Shoots destined to grow 12 inches or more did not provide good cutting material, and tip portions or basal portions of such shoots failed to root. Cuttings with an actively growing terminal continued to grow after rooting, whereas those with a dormant terminal bud did not grow until dormancy was broken by a cold treatment. Shoots with an actively growing terminal were found to be difficult to maintain in a good turgid condition in the rooting medium. In some instances, if the terminal appeared to be too soft, it was removed when preparing the cuttings. The selection of the cutting material is most important because if shoots with dormant terminal buds are used, one year's growth will be lost.

A relatively high concentration of either IBA or NAA was found necessary to induce a good rooting response on hybrid lilac cuttings. The solution soaking method required a 24-hour treatment in solutions containing from 40 to 80 mg. of active chemical in one liter of water. The solution soaking method has been largely replaced by the talc powder method because of the work and time involved in preparing solutions and the problems involved in preventing the cuttings from wilting dur-

ing the 24-hour soaking period. The concentrated dip method required concentrations of from 10 to 20 mg. of active chemical per ml. of solution (20 to 30 times stronger than used for solution soaking). In preparing concentrations of IBA or NAA in this range, 95 per cent ethyl alcohol must be used to dissolve the chemicals since they are not water soluble to any extent. The problem of evaporation is always present when using alcohol, and care must be taken to prevent this evaporation, particularly in holding or storing the concentrates. For the talc treatments a concentration of from 8 to 12 mg. of active chemical per gram of talc gave optimum results. Commercial preparations of IBA in talc are available, and one that is of particular value and which we have used to a large extent is Hormodin Powder No. 3. These talc preparations will lose strength over a period of years and should be bought in limited quantities so that preferably, they are not held for more than two years. IBA and NAA were found to be of equal activity for inducing roots on the lilac cuttings and induced a 75 to 100 per cent rooting response in one month. Treated cuttings averaged 10 roots per cutting in contrast to one or two roots found on untreated cuttings. Less than 25 per cent of the untreated cuttings rooted.

A limited amount of work has been carried out at the Boyce Thompson Institute on the use of the misting systems for propagation. They certainly should be of considerable value in the propagation of hybrid lilacs since one of the difficulties encountered has been preventing wilting of the young cutting material while in the propagating bench. The use of the misting systems, however, does not preclude the use of the correct type of cutting taken at the correct stage of growth and treated with the correct root-inducing substance.

Any propagation methods now in use should certainly be adaptable for propagating cuttings of the hybrid lilacs. If the critical requirements discussed in this report are met, a propagator should have no difficulty in obtaining a 75 to a 100 per cent rooting response of the French hybrid lilacs within four or five weeks after the treatment.

Literature Cited

- 1 Kirkpatrick, H., Jr. Propagation of lilacs on their own roots. Amer. Nurseryman 69(6) 3-4 April 1, 1939.

PRESIDENT SCANLON: We are all indebted to you, Dr. Kirkpatrick, for meeting with us today and discussing your work with lilac cuttings.

The next speaker on our lilac panel, Roy M. Nordine of the Morton Arboretum, Lisle, Illinois, needs no introduction to the members of the Plant Propagators Society. He is one of our original members and a constant and loyal supporter of the Society.

Mr. Nordine presented his paper, entitled "Production of Lilac Plants from Cuttings." (Applause).