PRESIDENT SCANLON: Thank you, Roy. Our last speaker this afternoon will be our good friend, Carl Kern, Wyoming Nurseries, Cincinnati, Ohio

THE USE OF GRAFTS TO OBTAIN OWN-ROOTED LILACS

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Recently I became the well-pleased owner of a copy of *The Lilac,* a monograph by Susan Delano McKelvey My interest was aroused concerning the most satisfactory method of propagation of the hybrids of *Syringa vulgaris,* better known to the trade under the term of 'French Lilacs.' The work of this author is an outstanding achievement in the annals of writings in horticulture, especially of a genus possessing such complex aspects as the lilac with its many garden forms and varieties.

I have studied the able comments made by many authorities, such as the late E. H. Wilson, E. O. Orpet of California, the late John Dunbar of Highland Park at Rochester, N.Y., the eminent hybridizer of lilacs, Mr. Emile Lemoine, Nancy, France, and many other European and American experts. I am impressed by the many theories as to methods of propagation and as to desirability of suitable understocks. A summary of opinions, however, clearly shows that hybrid lilacs on their own root are the most desirable.

There are only three possible ways for the increase of lilacs on their own roots by the usual vegetative methods of propagation: Cuttings, layers, and suckers

Cuttings: Cuttings may be made from partly-ripened green-wood during April and May depending upon the locality. They are treated in the usual manner as soft-wood cuttings of woody plants. The production of saleable plants from such cuttings is often a long and tedious process and entirely too costly from the viewpoint of the producing nurseryman, as he must meet the competition of budded or grafted lilac plants in the open market.

Layering: This is a good method which perhaps has been most practiced in Europe and especially in England. Here again we are confronted with the important factor of the time involved.

Suckers: The practice of taking suckers or runners from own-root plants is feasible They are often produced freely with some varieties but others will sucker very sparingly or not at all. This erratic behavior of many of our hybrid lilacs is proof enough that we could not depend entirely upon this way of propagation for general satisfactory results

In the conclusion of an article written by the late John Dunbar of Highland Park on lilac propagation (Florists Exchange, Sept. 1923) he stated: "There is an urgent demand for lilacs on their own roots for permanent plantings, and, whatever methods nurserymen adopt, the aim should be ultimately to establish them on their own roots."

It should be realized, with the present methods of propagation, that one can not promise that all budded or grafted pants will eventually grow on their own roots even if deep planting is recommended and practiced. Satisfactory results are too uncertain and the purchaser is the loser in the end. The question of price is not always important, when quality is the deciding factor.

It is conceded by many authorities that, in order to produce lilacs in commercial quantities, some type of a graft holds out more promise for success than any of the mentioned methods. With this idea in mind, I have perfected a simple method of grafting the lilac which I would name the 'inverted wedge graft.' In this form of grafting, my plan is to obtain as many callusing or contact surfaces as possible I place most reliance upon the blunt and exposed ends of the split scion for the maximum amount of callus and of subsequent root formation.

For understocks, I prefer California privet (*Ligustrum ovalifolium*) cuttings. For the more northern states where the California privet is not sufficiently hardy, I presume that the English privet (*L. vulgare*) would furnish a suitable substitute This may be debatable from what I heard in the talks today In preparing for winter grafting, I use hardwood cuttings each 8 to 10 inches long and containing 4 or more nodes. These are made a year in advance of grafting and are planted outdoor, for rooting as soon as the ground thaws in the spring.

These cuttings must be planted deeply so that the cuttings will root at several nodes In the fall of the year, these rooted cuttings are dug and stored until the time of grafting in January and February. At that time, the rooted cuttings are cut into 2½ to 3 inch pieces with a rooted node on each section. For summer grafts, I use ripened wood of the current year's growth

In selecting scion material, I use the current season's growth of choice lilacs. If possible, I divide these scions so that the terminal one will have three pairs of buds and the lower ones only two pairs. The base of each scion is nearly one inch below the lowest bud.

In some recent experimental work with cuttings in the Department of Floriculture and Ornamental Horticulture at Cornell University by Dr. L. C. Chadwick, it was found that *Syringa* belongs to the group of plants which root best when the basal cut is one-half inch below the bud. It is believed that in this particular area, there are the greatest number of dormant root initials. These must be present and stimulated into action to obtain the prompt own-rooting of the lilac scion.

The grafting operation is reduced to as few motions as possible. The understock is prepared by two cuts, one on each side of the top of a rooted section of the hardwod cutting, forming an inverted "V"-shaped wedge. Then a lilac scion of approximately the same diameter is split upward through the middle of the stem, carrying the cut through the area of dormant root initials. The scion is then laid over the stock and tied in place.

The usual storing of completed grafts in a cool cellar or storage house is recommended with an occassional examination during the latter part of February and early March as to their state of advancement

of growth. Too high a temperature will excite the buds. If too far advanced at planting time this premature activity will reflect itself in unnecessary losses.

The callused grafts are planted in light sandy soil under irrigation and are given the same treatment as root-whip grafts. The grafts should be placed with the union completely covered by the soil As soon as root action sets in, the function of the short understock of California privet as the main supporting unit diminishes as the vigor and root formation of the scion advances in like proportion.

For summer grafts, I use ripened wood of the current year's growth of the California privet for understock purposes. The grafts are made on unrooted cuttings about three inches long. The method is exactly the same as with the winter grafting. The completed grafts are handled under glass in frames in a manner similar to that used for soft-wood cuttings. The union is placed below the level of the bed and callusing takes place as the base of the privet begins to root. These callused and partly rooted grafts may be wintered by mulching the frame or by any other treatment given to slow rooting summer propagated plants. The rooted grafts are planted out the following spring for growth into size.

In offering this suggestion for the grafting of lilacs to the nursery industry at large, I do not claim that this method could not be improved. It has given me satisfactory results which have pointed the way to the production of own-root thrifty plants on an economical basis in the shortest possible span of time.

Now, in concluding my talk here, I will say, however, I have found there are certain of the lilac hybrids which go on their own roots using this method of grafting very rapidly, some types that will not go on their own roots until the second year, and that some will never do it. They just refuse to do that sort of thing, and if you realize that we are dealing with over 800 main varieties of *Syringa vulgaris,* let's pick out at least 10 or 20 of the best top variety flowers and forget about the others.

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PRESIDENT SCANLON: Carl, we thank you very much for these tips on the propagation of lilac.

The time has now arrived for the many questions and comments which I know these talks will raise.

MR. RICHARD VAN HEININGEN (Van Heiningen Nurseries, Deep River, Conn.): Mr. Nordine, how do you feel about grafting hybrid lilacs on *Syringa vulgaris?*

MR ROY NORDINE: I believe this to be an unethical and unfair practice because of the suckering habit of common lilac that presists during the entire life of the plant. I don't know when it begins on lilac seedlings but I presume sometime after the second year and would increase with age. It might be possible for a few vigorous varieties to outgrow the lilac root by their own roots, but surely on most varieties, the root piece used will continue to grow and serve as the root support-

ing the top. Lilac roots are vigorous and most certainly would also retain their natural habit of producing suckers from the root stock. This may not appear during the three or four years the plants are in the nursery I believe the owner of a lilac plant is entitled to the variety they purchased and not one that produces suckers of an inferior variety.

MR. VAN HEININGEN: In Holland, they used to graft white varieties on a dark type of lilac. When suckers came up you could tell by the buds they were suckers The dark varieties were also grafted on the white type. We imported lilacs from Holland in 1948 in order to get stocks. They were grafted very high. The distance between the crown of the plant and where the roots started was probably a foot or more on one-year old plants — a terrifically long stem. We planted those along with our own grafted material which was then grafted on privet There was never any comparison between the growth of the ones grafted on *S vulgaris* and the ones grafted on privet. The privet definitely stayed behind all the while and, sometimes, they just didn't grow beyond one or two years' growth.

Some varieties, such as Alphonse Lavallee and Michel Buchner, went on their own roots.

MR PETER ZORG (Cartwright Nurseries, Collierville, Tenn.): May I comment on grafting *Syringa vulgaris*? . In Holland, they start right away by de-eying the one-year seedling to be used as understock. In the second year when the seedling is growing to grafting size they continue to de-eye the seedling.

When these understocks are properly de-eyed, the lilacs are grafted on the *Syringa vulgaris*. As soon as any suckers are found they go through the row and take the suckers off, and after a certain number of years there are no more suckers. I don't see why we can't graft lilacs on *Syringa vulgaris*. There is no doubt that is the best understock. It is much better than privet, but the privet suckers are easy to distinguish.

MR. CASE HOOGENDOORN: (Hoogendoorn's Nursery, Newport, R.I.): I was surprised to learn this afternoon that they use green ash as an understock. You say that is compatible for lilacs?

MR. WEDGE: It is enough to use.

MR. HOOGENDOORN: Is it more valuable than privet?

MR. WEDGE: We get a better stand with green ash than privet. According to our tests the green ash always came out ahead of the privet in percentage of stands. It is also much cheaper to produce than the privet

MR. HOOGENDOORN: A lot of our lilacs don't go on their own root even if you graft them. Now, personally, I don't think privet is the cause. If the scion doesn't go on its own root you never get a good lilac. What happens to the ash? Does it produce a better plant if the scion doesn't go on its own root?

MR. WEDGE: When we dig our lilacs in two years you find very little sign of the ash root It is either ready to come off or almost

off. I would say you wouldn't find more than one or two per cent that shows any sign of the ash root growing. Maybe with a few varieties there may be as much as 10 percent.

MR. HOOGENDOORN: What happens to the other varieties which refuse to go on their own root after that?

MR NORDINE: In northern regions where winter temperatures are reached 15° below zero, and the frost line is six feet, and where winter winds are bitter cold, privet, even Amur River North is not hardy. It cannot be depended on as an understock for lilacs. Nurserymen in these area have been using Ash as an understock all the years that lilacs have been grown.

PRESIDENT SCANLON: Another question from the floor?

MR. KENNETH REISCH (Ohio State University, Columbus, O.): In those tests that you ran, Dr. Kirkpatrick, how many cuttings did you use in your treatment?

DR. KIRKPATRICK: In most of those tests, particularly those I showed photographs of, a maximum of perhaps ten to a treatment, that is in one test, but the tests were always replicated The percentage figures were based on more than one test.

MR. REISCH: Did you state that root-inducing substances were detrimental at low temperatures?

MR KIRKPATRICK: Yes, to the extent that we know these root-inducing substances, show less activity at low temperature than at a high temperature That applies to the whole field of plant hormones and many times when you treat cuttings with a root-inducing material and hold at low temperature, particularly between 45 and 55, you get a little proliferation at the base of the cuttings and it will rot. Many times you will get much more basal rot on your material with treatment at low temperature than if you didn't use the treatment at all. In other words, our recommendations have always been to use root-inducing substances at the higher temperatures.

DR. STUART H. NELSON (Central Experimental Farm, Ottawa, Ontario): We have heard a lot of different dates mentioned for making lilac cuttings The panel comes from various parts of the United States. Could we correlate the best time for taking lilac cuttings with, let's say, the floral development?

MR KIRKPATRICK. I don't think so, although I am not sure. I doubt very much if the exact stage of growth could be correlated with the stage of flowering, if that is what you mean. I think that many times the weather would affect the flowering more than it would the development in growth after the buds break. Perhaps someone else here will have a different idea.

DR. L C. CHADWICK (Ohio State Unversity, Columbus, O.): One comment relative to Nelson's question, I believe your question applies to a correlation of the rooting with the development of flower buds for the following year and not with the blooming period of the current season.

DR. NELSON: No, I was thinking particularly of flowering of the current season.

DR. CHADWICK We are running some experiments right now at Ohio State where we think there may be some direct correlation with rooting and the formation of the flower buds for the following year You will start with a high percentage, as has been indicated here, and just gradually drop on most varieties until the flower bud is formed for the following year, which on a few varieties we have examined is about the 20th of June, in Columbus, Ohio. Also, there is a little indication that once that flower bud is formed, then the rooting percentage will start going up again.

MR ROGER COGGESHALL (The Arnold Arboretum, Jamaica Plain, Mass.): I will add a little more confusing information to this topic As far as lilac cuttings, we make the cuttings when the annual growth is long enough to make a cutting. Now that is way before the lilac is even thinking of blooming. Not only that, but we run it roughly, depending on the season, of course, from the first week until the fourth week. In that range, if we take the first flush of growth that is four inches long, that will root just as well as cuttings from the same plant taken a month later, providing we take the terminal portion of the growth. It is very soft, immature growth The cuttings are stuck directly into the ground under polyethylene plastic.

The advantage of taking them at this time of the year, and I concur with Mr Kern, is that we can root them in relatively short time, one to six weeks. The plastic is gradually removed and you have most of the growing season ahead of you. Depending upon the variety, the cutting grown in the ground will grow two to eight inches in the first growing season.

MR. HANS HESS (Hess Nursery, Mt. View, N.J): I wonder if any of the gentlemen on the panel have had any experience regarding the difference between the cutting and the graft as to the length of time required from the time the plant is propagated until it develops flowers? There are a number of people that say a graft will flower sooner than a cutting.

MR. SIEBENTHALER: I will say this much about it, some of them will set flower buds in the bands in the lath house or the deep pit. On the other hand, some of them won't. Being primarily interested in the retail value of these plants from a commercial standpoint, we don't feel we can very well sell them until they have a good flower bud formation in the spring, which is primary when we do sell them. From that standpoint, we feel we get very good flowering from the cuttings. If we didn't we wouldn't grow them that way.

MR. VAN HEININGEN. How long does it take?

MR. SIEBENTHALER. Four year plants. As I said, some of them were bands in the lath house.

MR HANS HESS: Would you say that is faster than grafting?

MR. SIEBENTHALER: I made a statement before, that we quit grafting before I was born.

MR. WEDGE: You are asking about length of time the grafted plant takes to flower I think that practically all of the grafted plants will be in good shape in three years, some in two years' time.

MR. PAUL BOSLEY (Bosley Nursery, Mentor, Ohio): We used to grow lilacs by a method that still today seems very obvious. We bud on California privet The second year you have a plant that is 18 to 24 inches high. At the end of that year we lift those plants and here is the gimmick we take an ordinary wire label and twist it on the lilac itself, just above where the bud comes out. We than replant the lilac about four to five inches deep in the ground. Then as the lilac continues to grow, that label wire starts to choke off the nurse stock, like weaning a baby. That lilac, in order to live and survive, has to make its own roots. It continues to grow, and we have had excellent results. The privet is buried, choked and dies. If you have a variety that is difficult to get on its own roots, you can make a cut in he lilac stock insert a tooth-pick at the time you bury it and you have an easy practical way of getting lilacs on their own roots. They are always saleable and you can beat the time by grafts or any other method I know of by years.

MR. RICHARD FILLMORE (Duke University, Durham, N.C.): *I would like to ask Mr. Sjulin if he has had any experience with mist propagation?*

MR. SJULIN: We had had some experience but we had the trouble that was mentioned previously of the leaves falling off after they rooted. I would like to pass that on to Mr. Templeton..

MR. HARVEY M. TEMPLETON (Phytotektor, Winchester, Tenn.): *We have had fairly good success rooting the easier varieties, but the difficult ones are still difficult, commercially impractical I would say. Mist doesn't help any.*

PRESIDENT SCANLON: Ladies and Gentlemen, our closing hour has arrived. Save additional questions for tonight's session.

I want to express our sincere appreciation to each and every member of this panel on lilac propagation for a very interesting and informative afternoon.

The session recessed at 4:20 p.m.

PLANT PROPAGATION QUESTION BOX

FRIDAY EVENING SESSION

November 30, 1956

The Plant Propagation Question Box Session of the Sixth Annual Meeting convened at 8 p.m Mr. Jack Siebenthaler, The Siebenthaler Company, Dayton, Ohio, was the moderator for the evening.

The transcript of this very successful session of the annual meeting is not included in these Proceedings.

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