

MODERATOR, COGGESHALL: Thanks, Bill, your discussion was very interesting.

MR. FRANK O ANDERSON (Belle Valley Nursery, Erie, Pa.): How old is this plant before it will bloom?

MR. FLEMER: It takes a long time, about 15 or 20 years.

MR. FILLMORE: Are the buds de-wooded?

MR. FLEMER: They are de-wooded. We use only the shell of the bark with the bud attached.

MR. JOSEPH C. MCDANIEL (University of Illinois, Urbana, Ill.): Have you tried budding *Sophora* on anything else?

MR. FLEMER: No, we haven't. I doubt if it would take on either *Gleditsia* or *Robinia*.

MR. CARL E. KERN (Wyoming Nurseries, Cincinnati, Ohio): I understand that the roots of *Sophora* trees grow straight down, like the horse radish. If permitted to grow in the nursery, the main root will go three to four feet straight down. Therefore, root pruning is necessary.

MR. FLEMER: It is true that they have deep taproots. Our experience has been that we get better growth if we dig the *Sophora* as two-year-old trees and actually transplant them, than if we merely run a blade under them and leave them where they are. The same thing is true of honey locust trees. I think Jack Siebenthaler will agree. If you run the blade under them it glazes the ground or something underneath the tree and they stand still and refuse to grow, whereas, if you transplant them and prune them severely with the shears, they grow much more rapidly.

MODERATOR COGGESHALL: Our final talk this afternoon is also concerned with the propagation of roses. Mr. Harold A. Barnes, Barnes Roses, Inc., Huron, Ohio, will discuss the budding of roses.

Mr. Barnes presented his paper, entitled "The Propagation of Roses by Budding." (Applause)

PROPAGATION OF ROSES BY BUDDING

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In the fifteen minutes which has been allotted for the "Propagation of Roses by Budding" I shall try to cover the most important details. I shall devote the first part of my talk to the actual technical details of the subject and the second part to some of the pitfalls and details which may not be fully understood at the moment.

Present day commercial propagation of roses is done by budding, not by grafting as in years gone by. In the beginning, as with any crop, we must start with the plot of land involved for the crop. Roses, of course, grow best in clay soils, but contrary to this, my first crop of roses was raised on pure sand, and for a beginner, I still consider that first crop a good one.

Roses grow well in a pH of 5.5 to 7.5, which gives the grower a wide tolerance with which to work. As a starting point, wild rose (*Rosa multiflora japonica*) is planted in the spring just as early as your soil will permit you to do so. Late March is excellent if it is possible to start that early. Two types of understocks are commonly available to the trade now, one is seedling, the other is rooted cuttings.

At our nursery we plant our rows 42 inches apart and the wild stock 10 inches apart in the row. We have recently started to block our fields so that we have a strip which will provide solid bearing for heavy machinery, in case of long sustained wet weather in July, August and September. We are then able to use as a stopgap a high velocity duster to control Blackspot. This is a related subject which I will not discuss further as time does not permit.

As each block is planted, usually 35 rows, we use 12 inch disc hillers to cover the understocks to the very top — when this is completed we move a line of irrigation in the middle and water for approximately one hour. As a result the soil is washed away from the top of the mound and all of the top lateral growth is then above ground. This whole process, as you know, tends to keep the plants from drying out until new roots are formed.

The next step is to cultivate for weeds — this time lapse can be from one to four weeks, depending on weather. The minute that weeds are one-half inch high, cultivate again with disc hillers only in reverse this time to take the soil away from the plants. Usually our hillers are set at five inches. In other words, we have 2½ inches clearance on both sides of the plant. Never let any mechanical or hand tool touch the understock itself as this will wound the cambium tissue and at budding time the bark will not open properly. We do not make any attempt to etiolate the understock during the growing period. If, in the normal process of growing, we find it profitable to again use disc hillers to cover small weeds in the row, we do so.

In former years, some growers have felt that a good etiolated plant budded better, but we do not share this belief, principally because it is generally all hand work to remove this hill of soil which is around the plant at budding time and this constitutes another labor expenditure. From this point forward it is mostly a process of good growing practice until approximately July 1st in our area. At this time, we start to bud our plants. Usually we bud polyanthas first, on seedling understock, as they seem to come into shape some two weeks before the rooted cutting stock is ready.

Our budding procedure consists of three men per crew. One man to clean the soil away from the plants and wipe the working area of the understock with a clean rag. The second man to follow is the budder. He slips the bud into the understock and the third man makes a tie with a rubber budding strip which seals the wound completely — leaving only the tiny eye exposed. To go a little into detail concerning the budding eyes, they are cut from the present blooming field. The man who cuts the eyes from the field must have had considerable experience as this operation is very important and can "foul up," so to speak, a large part of your operation. In general, we select rose canes that

have had a bloom on them. At the proper time, this bloom has just started to dry up and is in a somewhat brittle condition. The thorns on this cane have brown color and will readily snap off with a little side pressure, leaving a clean scar — not a torn one. Further — this cane will not squash when pressure is put upon it by first and second fingers. It is true that because of human error, we are not always able to cut our budding eyes in this condition, but head in the direction of these better requirements and your over-all bud stand percentage-wise will be better.

The next step in eye preparation is to make sure that these canes do not dry up in the process of collection. Usually we cut one variety at a time, place them in water at the time of cutting, bring them to the storage shed, de-thorn them, wrap them in wet newspaper and tag them twice as to variety and number of buds in the package, place them in refrigeration until the budder calls for this variety.

To recap this information and put it into workable form, here is an example. The bud cutter, or eye cutter, wants 500 buds of "Peace." He equips himself with a pail of water, pruning shears, and the location of the variety in the blooming field. When he locates the row, he inspects the plant for the cane he wants to cut, making sure that if he cuts this particular cane, he does not permanently cut this plant down in size from a No. 1 to No. 1½ or No. 2 plant. This is accomplished by taking a lateral branch, or a main branch, only if there are 3 or more left on the plant, or if there are signs of a new shoot growing from the main graft, he may then cut a perpendicular cane from the plant.

In de-thorning, one small point to catch before we continue — the canes are all placed facing the same direction in the package so that the leaf scar is below the bud — this permits the budder to draw the cane from the case with less injury to the individual eyes and also the cane is in the right position for the budder to cut the eye out of the cane without turning the cane around.

The budder takes the 500 "Peace" buds that have been cut and conditioned for him, goes to the field with two men (the cleaner and the typer). The cleaner counts off 500 understock, labels the row "500 Peace" and the operation is underway. The budder selects a cane from his case and cuts an eye from the cane, removes the small bit of wood from the back of the bud eye, rakes his left foot and tips the top of the understock to the ground. This exposes the working area so that he can make a "T" cut in the understock and slip the eye into the cut. The top of the "T" cut is made first and the bottom of the cut is made last; as the budder is cutting the last tiny portion of this last cut the knife is twisted in position — ever so slightly, this allows the tabs (we use that word in want of a better one) at the finishing part of the cut to remain open and the bud is inserted with a deft push. Often in order to insert the bud tight enough the budder must place the back edge of the knife directly on top of the bud to gain a jutting surface on which to push. Too hard a push will break the tiny eye from the bark and then the bud will not grow and has to be removed. Sometimes if too many eyes are spoiled the budder will place his knife on the back just above the eye and push in that area. However, if the sap is flow-

ing properly, within the plant, and other conditions are normal, this difficulty is not present. The budder then continues to the next plant and so on down the row.

The typer using rubber budding strips within 10 plants behind the budder. This is a "must" as the cut portion of the plant and eye will dry out very fast and die if not sealed up quickly. The rubber budding strips are 5 inches long and $\frac{1}{16}$ inches wide. The typer fastens the end and puts four complete winds underneath the bud and five complete of the strip on the understock by friction, crossing the strip on itself winds on top of the bud and ties the top by stretching the top of the band and pulling the end through the loop and again friction holds this from coming undone. The number of winds on top and bottom of the eye is conditioned by the length of the cut made by the budder. We always cover any and all of the wounded surface below and above the eye. A poor wind can cause the eye to push itself out from the union and result in a kill or at best a poor union.

At the end of 21 days, the budder with perhaps 50 more eyes of "Peace" will go over this variety (originally budded 500), cutting the band on the opposite side of the eye and the band will unwind itself and come off if it is cut in the proper place. If the eye is green and healthy-looking, we have a "take." If it is brown, or in any way looks poor, the budder will "re-bud" either below the first bud, or above, or on any other portion of the stock that is workable. The bands on this re-budding operation are never cut and remain on the understock until the wild top is cut in February. These bands ordinarily do not cut into the stock as the growth process increases because of the lateness of budding. However, this must be checked as it can girdle the stem if conditions are right for very rapid growth.

Nothing more is done in any way to the stock in the field until late February and early March when the wild tops are cut 1 to $1\frac{1}{2}$ inches above the bud union, this is done with a short scissored topping shear. To avoid trouble such as the wind catching these tops and rolling them away and from freezing conditions anchoring them to the ground, we cut approximately 1,000 tops and gather them up at the end of the row and immediately burn them. A little kerosene is enough to start the fire rapidly, as the oil in the stems will make them burn with terrific heat. Other than cataloguing your field with a master chart, your work until the following spring is completed.

During spring cultivation extreme care must be taken so as not to break off the fast growing tender shoots. When the new rose canes have reached a length of 6 to 8 inches, cut them back half way. This will keep these shoots from breaking in the wind and will force the plant to throw new shoots from the basal portion of the graft. We go over our field as often as five times in the five or six weeks that the canes are in active growth during the months of April and May, making sure that each plant has had at least one pinch.

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MODERATOR COGGESHALL: Thank you, Harold, for this discussion of budding roses.

MR. FLEMER: For a given variety, do you prefer to use seedlings or hardwood cuttings for understock?

MR. BARNES: Production-wise, I prefer to bud on the cutting because it is faster. However, once you have a bud started on a seedling you can almost ring the cash register. Seedlings get very thorny late in the season and the budders dislike it.

MR. FLEMER: Do you cover the buds during the winter?

MR. BARNES: No, we do not

MR CHARLES A BURR (C. R. Burr & Co. Inc., Manchester, Conn.): What is your average success with hybrid teas?

MR. BARNES: We have been averaging 85 to 90% on bud stand. We have had a lot of adverse weather these past three years, and gradings will not average 60%.

MR. PETER ZORG (Cartright Nurseries, Collierville, Tenn.): How can there be any question about compatibility on multiflora understock?

MR. BARNES. We have had experience of incompatibility with some understocks.

MR LOUIS VANDERBROOK (Vanderbrook Nurseries, Manchester, Conn.): Do you find incompatibility with the thorny or thornless multiflora?

MR. PAUL BOSLEY (Bosley Nursery, Mentor, Ohio): There is a distinct difference, at least 10%, in your bud stands between thorny and thornless understock, in favor of the thorny understock. We now specify nothing but thorny understock. There is a difference between cuttings and seedlings. Now a seedling is a normal, natural root system and the bud is put on the root tissue. Above the crown on any multiflora, the top is constructed differently, made up differently, and a rooted cutting is simply a piece of the top that has had to make an emergency root system in order to live, and there is a distinct difference. We get better stands on thorny stock than we do on thornless stock.

MR. McDANIEL: Is th thornless available in seedlings?

MR. BOSLEY: There have been certain strains of thornless developed. Seed picked from thornless understock will have a tendency to be somewhat thornless, and of course, with rooted cuttings you can select your wood and make them absolutely thornless.

While I am on my feet, I would like to make just one point about the winding with rubber bands. One year we had an experiment where we wound rubber bands solidly. Did you ever wear a pair of rubber boots in the summertime? That is exactly what is happening with your rose when you wind your band solidly. We took a block on every variety. Half were wound solidly and half were wound with spaces. small spaces to be sure. We found as much as 10 per cent difference between the space band and the solidly wound rubber band. Now we try to have our winders give the rubber band some space.

MR. HENNING: Why is there a higher percentage of suckering from root stock propagated from hardwood cuttings as compared to seedling root stock material?

MR. BARNES: That is true and to the best of my knowledge that will always happen. In fact, there are some varieties of rooted understock that will sucker terrifically. There is a lot of difference in the material. There are a great many different types of multiflora rose, a great many more than a great many of us realize. Any grower who has kept this plant on his place for fifty years may have many different plants of his own. Many times we start propagation from a plant that is not the best we could have, had we selected better. That is another factor in favor of seedling understock. I don't know as I have ever seen one sucker. There may be a possibility they could, but at least your troubles are far less.

MR. MERTON CONGDON (Congdon's Wholesale Nursery, North Collins, N.Y.): How many of the buds start growing the first year?

MR. BARNES: I find that it depends upon the time you start budding and also the weather, but on an average I would say perhaps 30 per cent will grow out. I am not in accord with all of the growers, but I like to see this condition. I wish I could make it happen more often. On a seedling understock it won't make much difference.

MR. JOHN B. ROLLER (Verhalen Nursery, Scottsville, Texas): You can increase the percentage of the ones that break out this year in the selection of the buds that you use. It has been a long time since I have done very much budding, but if you take a good strong bud from the stick that is almost ready to break out, go ahead and bud it, because it has a tendency to break out early and give you a lot of these the same season if the bud is ready to break.

MR. BARNES: I will go along with that to this point; in a big production, time nor conditions permit you to select that kind of budwood. Other than that, I would go along.

MR. C. E. KERN: While I was out in California I visited one of the big rose nurseries. In their workshops I noticed quite an elaborate system of refrigerators. I was very curious about that. What do we do with refrigerators in budding roses in a nursery? I found out in California they get the budwood after their normal budding period is over, I imagine sometime in September, because they haven't had any frost yet. They will cut budwood, trim it properly, stick it in polyethylene plastic bags, put it in the refrigerator, carry it over at 35° or 40°F. until the first week in May when they are out in the field budding again on rooted cuttings which they had stuck in January. Of course, for us Eastern and Northern fellows that doesn't mean anything, but you can readily see where those boys can steal a ride on us as far as time is concerned.

MR. JIM WELLS: I understand that a number of people refrigerate their buds for ten days or so before budding. Do you know anything about that in California?

MR. KERN: All I saw was the refrigerating outfit and, of course, due to the climatic conditions those fellows had tremendous advantage. Their greatest trouble is to stop their roses from growing in the Fall to get maturity. The only way they can do it is by cutting down their irrigation, no more water for maybe a month or two months, and gradually getting the maturity of the wood, and finally, they will get a ripening of the wood after which time they are able to dig. Now they tell me they have considerable trouble when the digging period comes, they are confronted with too much mud and they have to yank that stuff out of the mud.

As far as carrying over those buds, they are sure they can carry them over for three or four months until about the first week of May and the buds take it and they go right on. The following year they cut that early May bud back and by Fall they can have another finished plant.

MODERATOR COGGESHALL: Thank you very much, Harold.

This concludes the afternoon series of speakers on the Speaker-Exhibitor symposium. I thank each of the speakers again for the interesting discussions.

The meeting recessed at 5:00 p.m.