

Davidii  
divergens  
Ginnala  
glabrum  
grandidentatum  
Grosseri  
Henryi  
japonicum  
leucoderme  
macrophyllum

Pseudo-Sieboldianum  
rufinerve  
saccharum  
Sieboldianum  
spicatum  
tataricum  
tegmentosum  
tetramerum  
truncatum  
Tschonoskii

Chairman Nordine: The next topic on the program involves two individuals, one that you are perhaps well-known with in the nursery trade, and he is Wayne McGill. Unfortunately, he could not be here, but he has prepared this paper on the budding of maples, which is certainly an interesting thing and something in which everyone is interested.

Dr. Snyder of Cornell University, will read this paper and the Plant Propagation Society or plant propagators in the country are certainly most fortunate in having Professor Snyder. It is the first time that a plant physiologist is working in conjunction with the problems of plant propagation, and plants in general. So we are very happy to introduce to you Professor Snyder from Cornell, to read this paper by Wayne McGill.

DR. SNYDER: This paper, as Mr. Nordine has said, was prepared by Wayne McGill, and the title is, "The Selection of Maple Understock, Budwood and the Timing and Placement of Buds."

. . . Mr. Snyder read the paper . . . (Applause)

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## **The Selection of Maple Understock, Budwood and the Timing and Placement of Buds**

By WAYNE MCGILL  
*A McGill & Son, Fairview, Oregon*

Mr. Chairman, Ladies and Gentlemen:

I was greatly honored indeed when asked to prepare this paper on the selection of Maple understock, budwood and the timing and placement of buds. When Mr. Nordine asked me to present this paper I did not know that it was going to be a Round Table discussion and in preparing it I find it is much more difficult to prepare a paper which is going to be read than if one were going to read it himself. When reading it himself, any mistakes can be corrected as he goes along. However, as it is a Round Table discussion, possibly it is better that I am not here to present myself, for at least, I cannot be asked questions which I cannot answer. I feel certain that in the group there are many propagators with more experience than myself and a good many of them can answer any question that I have left unanswered.

The experiences and details as outlined in the paper are from our own growing experience and of course, references are made to the growing conditions on the West Coast. The Field Superintendent of our firm,

Mr. John McIntyre, has helped in the preparation of this paper and many of the practices we employ have been developed by him and certainly have gone far toward any success that we may have in the propagation of Maples.

References are going to be made principally to the propagation of *Acer Platanoides*, Norway Maple, and its types such as Crimson King Maple, Schwedleri Maple, Pyramidal Norway Maple and some special forms of Norway Maple that have been introduced by our good friend, Ed Scanlon. We have had little experience with propagation of any forms of the Sugar Maple or any other of the Maples. We probably should be experimenting more with the propagation of special types as they are certainly in demand at the present time but have been concentrating on the Norway Maple types as they do grow so well on the West Coast and we must say that the Sugar Maple does not do nearly as well and is much more difficult to grow.



*Mr. McGill in a field of 1-year Budded Crimson King Maples (Acer Platanoides var.)*

Mr. Nordine has talked about the collecting, care and sowing of Maple seed and while I do not wish to conflict in any way with what he has said, I would like to give a few side-lights on some of our practices in the collection and handling of our Norway Maple seed. We do not make any selection of seed from special trees for type, but of course, try to get seed that is well filled at harvest time. As possibly some of you know, the Pacific Northwest, especially in the section west of the Cascade Mountains, is affected with the *Verticillium* Wilt of Maple, which as we call it locally, is Maple blight. This is dependent considerably on weather conditions and is much worse in a season that has been too wet. In gathering seed we try very hard to eliminate any possibility of collecting seed from the parent trees that are affected with blight. This is very easily discernible

as the tree loses its leaves early and has many dead branches where the blight has killed them.

We have been experimenting lately with planting some Maple seed in the spring, as well as the fall. Customary practice in the past was always fall planting but sometimes weather conditions in the spring were such that it was very hard to get the seedlings through the ground. Late Spring frosts also took their toll in many cases of fall planted seed. For an insurance purpose we now plant part of our seed in the fall and about as much again in the spring. The spring seed is not stratified and we have just as good success with either fall or spring planting as far as germination is concerned. Even the growth is as much in the spring planting and we are very satisfied with having this insurance against a failure of the fall planting. At the present time we are using Norway Maple seed from two sources. We gather some locally from the section west of the Cascade Mountains but also get some from the section east of the Cascade Mountains. This is also used as an insurance proposition in case one of the crops of seed is not as good as the other.

From a commercial viewpoint the only selection that we make in the type of seedling that we use is to try to plant as large a seedling as we are able to raise in the one year from seed. To get a good growth after budding, it is essential that you have a good large seedling in which to bud as it takes a heavy root system to push up the strong, straight growth of a one year old Whip as is necessary for the basis of a good branched tree.

When it comes to giving the reasons for a good and successful stand of buds, there are several matters to be taken into consideration including the time of budding, condition of the understock, condition of the budwood and the human angle of the ability of the budder himself. I think it is quite difficult to place any of these in the most important position as it means a combination of all of them to make a success of the operation. There are certain points in each of the operations which might be stressed a little bit more than others and it probably would be better to take them up one at a time for clarification purposes.

Speaking of the time for the budding operation, reference will have to be made to the time that is used in the Pacific Northwest areas. We find that this usually is from the last week in July to the middle of August and we always try to place all of our Maple buds within that period of time, if at all possible. This is dependent, of course, somewhat on the season and weather conditions as to whether the seedlings are ready and also whether the budwood itself is in the proper condition. Year in and year out the dates given above will average out pretty closely in our area. Budding can be done up to the last week in August under some conditions but we have never found a successful stand of buds to be had if the buds were placed during the month of September or later.

The condition of the understock itself is, I believe, of the least importance as long as it is making a good growth and there is plenty of sap so that the bud will slip well under the bark. In our area we get a very small growth on our seedlings during the first part of the Summer but they usually start a second growth about the middle of July and are in full growth during the time that we bud them. They usually grow also until the first or second week in September in this rapid manner and it is at that time that the buds are uniting with the seedling and there must be this growth to cause this uniting process. It is needless to say that any seedlings

that are not growing or have dried up will never produce a stand of buds as there is no sap available for the purpose.

If there is any of the above mentioned items the most important, it might be the budwood itself. We have found that a budstick a little on the soft, growing side is much better than the type that has matured into hard wood and on which the terminal has formed. We like it hard enough so that when bent it will snap and not bend but also soft enough so that the top one-third of the stick is too soft and has to be thrown away. We find that the buds are better developed on this type of a budstick and will give us much better success in the long run. It might be mentioned here that a good, plump bud will give a much better tree in the long run, with a better stand and better growth than a small, weak bud which is often found on some of the well matured sticks of one year growth.

As you probably know, the Maple has a milky sap and it is our contention that this has a tendency to sour if allowed to stand too long. For that reason we think it very adviseable to use the wood almost immediately after it has been cut. If the wood is kept for four or five days, it begins to turn brown and is definitely not good for use under normal conditions. We try to use our budwood within a period of forty eight hours after it is cut from the parent plants. In preparing the budsticks for use our former practice was to tear the leaves from the stick, leaving no leaf stem at all. We have recently found that by cutting the leaves off and leaving a very short portion of a leaf stem to cover the bud, that the bud is protected, is easier to insert under the bark and this small portion of the leaf stem protects the bud from burning in the hot sun and also keeps the bark of the tree from growing over the bud as much as it did if there was no leaf stem on there. This latter situation may sound peculiar as you would think that the bark would grow over the leaf stem, too, but it seems to have a tendency to hold it open and give the bud a better chance to grow out in the Spring.

Under the title of the Human Element of the budder himself, it is our contention that a budder of many years experience will have no better stand of buds than a new budder with only one or two years experience. Of course, this depends a lot on the training that he has had but in the case of Maple budding, there is another factor that makes the above statement true. In budding Maple, we always dewood the buds, inserting only the bark and eye itself. When the propagation of Maple by budding started in the Pacific Northwest years ago, it was done by cutting the usual bud with a part of the wood in it. Poor stands results in most cases from this and if anyone got a fifty percent stand of Maple buds in this way, it was considered exceptionally good. Our own experience one year gave us a stand of only five percent and made Maple budding most unprofitable. We do not claim the discovery from experience of dewooding buds but it is a customary practice in the Pacific Northwest at the present time and we are able to get stands from eighty five to ninety five percent as a common occurrence. It is much simpler for a budder to cut a bud that is to be dewooded as the exact depth of the bud does not make so much difference. In some other items if too much wood is cut it is impossible for the bud to grow in properly but when the wood is removed, the bud sheath is usually cut quite deep anyway so that much of the bark will go under the bark of the seedling.

The buds are tied in with rubber as is customary in practically all budding operations these days and it is our practice not to cut these rubbers

as the rubber will deteriorate in due time and we have had practically no loss from them cutting into the tree as growth continues throughout the rest of the Summer. With this comparatively early budding and late growth, there is a tendency for some of the buds to start out and form a growth of three to four inches long but this is not harmful at all and these are merely cut back and started all over again the following Spring.

While the matter of cutting off the seedling in the Spring does not actually come under the subject matter of budding, a word might be said about this. It is our practice not to do this too early. We want to have practically all danger of severe cold weather to be past and the time period close enough to the growing season so that there will not be too much tendency for the seedling to dry back into the bud itself. We usually cut them from two to three inches above the bud and after they have started, cut them back close to the bud. This stub, in that way, gives them some protection during the early parts of the Spring.

In requesting some information as to what I wished to talk about, it was suggested that something might be said about the cultural procedures used in the first year or two of growing the tree after budding. This definitely does not come under the subject matter of the paper but I might give a few items of our practices which have proven very satisfactory.

The main object in growing a Maple after budding is to get a good, straight Whip which is suitable as a trunk for the finished branched tree in your customers planting. With us the growth is extremely rapid during the first part of the growing season in the early Spring and Summer. At that time the tree is extremely soft and has a tendency to form crooks, due to wind and rain and it is one of the "musts" that something be done to overcome these crooks that would show up in the finished product. This rapid growth is strongest during the first two to three feet growth of the tree from the bud. To eliminate the possible crooks, it was a cultural practice to use a six foot stake on every tree and keep tying them to the stake until they reached a height of five or six feet. This entailed constant work and much more expense than we felt necessary. Our method now is to use a four foot stake with one foot in the ground and three feet out. The growing tree is tied to this until it reaches the top of the stake with ties every foot and these ties are raised as the tree grows. When the tree reaches the top of the stake all ties are removed and if time permits, the stakes are then removed from the field.

*A little explanation of our reason for this might be of interest to you.* Referring again to the extremely rapid growth the tree is making in the early Spring, we have found that when the winds come, the tree has a tendency to bend six to eight inches from the terminal, causing the crooks mentioned. It is growing so fast and is so soft that within a day or two these crooks will harden and cause trouble if they are not staked. Therefore by tying the trees to a three foot stake these early bends are eliminated. When the tree reaches a height of three to three and one-half feet it is a little harder all the way through and any windstorm then has a tendency to bend the tree from the bottom instead of just the tip and the general condition of the tree then is of swaying from the bottom instead of bending from the tip. This may seem a little complicated but has certainly worked with us and has saved us many thousands of dollars in staking expense.

Getting back to the propagation matter itself, there are two other methods that might be mentioned. One of these is field grafting which is

practiced extensively in the Pacific Northwest. Dormant one year scion wood is used and the grafting done with a tongue graft on the seedling in the field. Frankly, we have never tried this ourselves but understand that some of our neighbors in the Pacific Northwest have tried it with fair success. The growth is not nearly as heavy as from a bud and of course is a much more expensive operation.

Another method is Spring budding. Dormant scion wood is cut during the Winter and placed in cold storage and just as soon as enough sap is flowing in the seedling understock to permit the insertion of the bud, the operation can be performed. With us this is usually sometime about the first of May. Of course, with wood in dormant condition such as being used in this case the bud cannot be dewooded and the stand is very problematical and usually poor. The growth also is much smaller than from a bud inserted the Summer before but this method can be used to increase the production of a scarce item a little faster.

This seems like a very simple report to present to a propagation society but I do hope the information that I have been able to tell you is about what was wanted. I sincerely wish that I could have been present in person to meet you all and talk over our joint problems but the pressure of work at home made this impossible.

I again wish to express my thanks for the honor and opportunity of giving you what little information I have about the propagation of Maple by budding.

MR. JOHN VERMEULEN (Neshanic, N. J.): Has anybody had any experience with budding maples in our section of New Jersey? Can you plant them in the spring and bud them in the same year or should they be potted and left over before they are budded?

MR. WILLIAM FLEMER (Princeton Nurseries, Princeton, N.J.): We bud a lot of maples in Princeton and we found you can fall plant the seedlings and have them in sufficient growth for budding the following summer, but spring-planted seedlings usually are well enough if you dig them and plant immediately and they bud satisfactorily in the summer. I might say under eastern conditions this rapid growth in the spring is much more important than it is on the west coast. If you don't get a strong growth at first flush in the eastern condition what we call rosette sets in and it peters out in the tiny branches and weak buds so it is important to fertilize either the fall before or very early in the spring to get a terrific surge of growth before a hot summer condition and mildew and leafspot will set in.

QUESTION: How large are the one year?

MR. FLEMER: We get six footers without much trouble if we get that early growth. If they are not in strong enough ground and they don't make that growth during the month of June, then you might as well give up.

CHAIRMAN NORDINE: Might I ask Mr. Flemer, is your reference only to Norway maple varieties?

MR. FLEMER: That applies to all the maples, all except silver which can be budded and will grow right through the summer. Red maples, sugar and Norways all seem under New Jersey conditions to get the rosette and they peter out into a number of tiny branches and weak terminal and

you have to cut them down to a strong eye, and that makes a crook in the tree.

CHAIRMAN NORDINE: We might ask, all your budding is summer budding or June budding?

MR. FLEMER: Summer budding—July. August is too late with us because the budwood on the older trees has already started to harden and the buds are stringy and they won't peel properly and won't unite. We have had no success with wood budding at all. If they won't peel like an apple you might as well give it up for that year.

CHAIRMAN NORDINE: Your experience, then, with so-called wood buds is the same as the west coast experience. They will not grow with wood buds; they must grow with peeled bud?

MR. FLEMER: That is right.

CHAIRMAN NORDINE: I am sorry to say I am not personally acquainted with Mr. Burton, but it is always a pleasure to introduce a good man. Now all of us in the nursery business have always known of Burton's Hilltop Nurseries at Casstown, Ohio. It has always been a good name, a reputable name. They have always had good stock. It is a pleasure to introduce someone with a good foundation and a good name. We present to you Mr. Howard Burton who will speak on "The Grafting of Some Maples." (Applause)

