

for a new crop. We transplant at this time and find that about 25 to 30% have rooted. We, of course, remove any dead material, bad leaves, etc. The rest of the cuttings that have callused and look clean are restuck, but this time into flats containing peat and perlite, 1:1. These flats are moved out into a shaded house and again intermittent mist is put over them, but no bottom heat. The mist is allowed to run over them throughout the summer until fall, then it is turned off. The cuttings are left in the flats throughout the winter.

We find, by spring, many of these restuck cuttings are rooted. Our total take after this method, both from the original transplants and the restuck cuttings, was 53% last year. This was on 4,500 cuttings. This is the method we use to propagate 'Ostbo Red' kalmia. The Dexter strain is much easier to produce since they are raised from seed sown in January. This strain will range in color from medium pink to dark pink with an occasional red. We are in the process of selecting two or three of the choicest pinks to propagate as clones. Over the years we have looked for a red which would be as good as 'Ostbo Red' but which would hopefully propagate a little easier. We have yet to find such a plant.

In summary, I would like to say that we really have no deep, dark secrets to disclose in regard to rooting kalmia cuttings. It amounts mainly to patience over a period longer than is required for most plant material to root, and close attention to details.

DAVID ADAMS: Thank you very much, Mr. Eichelser. Our last speaker of the day is Mr. J. D. Vertrees, Maplewood Nursery, Roseburg, Oregon. He has been growing Asiatic maple species for quite a long time. He's another one of these people that had a hobby that outgrew him and he found himself working at his hobby instead of at his regular job. He, like myself, was an Agricultural Extension Agent for many, many years. Now he will talk to us about the production of the Asiatic maples. Mr. Vertrees.

OBSERVATIONS ON PROPAGATION OF ASIATIC MAPLES

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In studying Asiatic maples for the past nine years, we have been able to collect much information from commercial nurseries, Arboreta, propagators, and collectors from all over the U.S. as well as Europe and Japan. We offer here some procedures and variations we have observed, or carried out ourselves. We emphasize that

there are about as many method variations of propagating these maples as there are nurseries or propagators. Each has his own method, and most of them are quite successful.

What was a hobby-study a few years back is now a full time effort of working with the smaller maples, particularly *Acer palmatum* and *A. japonicum*, and their numerous variations.

Remarks on propagation of this group must be preceded with a few words on nomenclature. The abundance of synonyms in *A. palmatum* is massive. Evidently this species is prone to sporting, or producing atypical seedlings. We know of over two hundred named clones or cultivars of this species. We have over one hundred sixty named varieties and cultivars in our nursery, as well as ten named types of *A. japonicum*, plus variants of other closely related species.

I am sure, however, that these are not all distinct. We, and other maple specialists are trying to collect and grow as many named individuals side by side to compare, and eliminate when possible, the duplicity in name. Several men in the U.S. as well as England and Holland are doing this. Propagation commercially under the wrong name is leading to mass confusion.

One plant is sold under four names here in the U.S.: 'Sangokaku', 'Senkaki' (also 'Sengaki'), 'Corallinum', and coral bark maple¹.

Another example is 'Crispa', 'Chishio', 'Crispum', all of which are really 'Okushimo', but also known as 'Involutum' and 'Kuruijishi'².

I find 'Chishio'³ ('Chiseo') applied to three different maples in the trade. 'Crispum' is applied to two. 'Shishigarshira' is sold as 'Chiseo', 'Cristata', and 'Crispum'.⁴

We could give many more examples, but only mean to point out that the proper nomenclature is essential. Unfortunately the red selection from *A. p.* 'Ornatum' (*A. p.* 'Dissectum Atropurpureum') called 'Ever-Red' is losing its identity and purity in the trade. We find almost any *A. p.* 'Ornatum' being sold as 'Ever-Red', in some cases.

Anyone producing seedlings becomes fascinated with the occasional unusual variant he finds. Most are not superior to named clones already on the market. There are two good exceptions here in

Ref: Monograph of the Aceraceae, A.E. Murray, 1970

¹'Corallinum' takes precedence

²'Crispum' is the valid name

³'Chishio' is in the Sanguineum group

⁴'Shishgashira' the prior name

the Northwest: A selection from *A. palm. atropurpureum* owned by Will Curtis, seems more vigorous and retains better red tone in the summer months than does 'Burgandy Lace'. Another is a particularly nice clone of *A. japonicum*, of the cut-leaf form, and a more prostrate habit than the type. It was originated by Art Wright of Canby, and has been named 'Green Cascade'.

Seedlings are easily produced for understock, and for green or red palmatum lining out stock. Seed shipped from overseas, and other dried seed, germinates rather poorly the first year, even with pre-treatment. Left in the seedbeds, a good percentage will germinate the second year. Dried seed may be soaked in 100° F water, gradually cooling, for 24 hrs. It can then be planted directly into seed beds in the spring, or held if necessary, in stratification.

Freshly collected seed may be planted directly in seed beds outdoors to over-winter, given protection from insect and rodent damage. It is sometimes desirable to stratify in peat-sand, moistened, in plastic bags at 34° F for 90 to 120 days, or until proper planting time in the spring. In the Northwest, planting can be rather early since light spring frosts do not seem to damage the young seedlings.

Soil fumigation for insect, disease, and weed control is important. We have excellent results with a methyl bromide-chloropicrin mixture. A seedbed high in organic matter, but with good drainage, gives excellent results. Since our soil ranges in pH from 5.6 to 6.6, we find the addition of dolomite lime beneficial. We feed nitrogen heavily while maintaining a high potash-phosphate level.

Our one-year seedlings are transferred to pots in the fall, for growing on the second year as understock. Some growers line out the yearlings and grow the two year understock in beds, potting them up the fall prior to grafting. Both methods work well.

Grafting periods seem to be a matter of personal choice. Many nurseries graft *A. palmatum* in February, others in March. Still others graft in July, August, November, December, or January. Each has his own schedule.

Some do summer budding in June, while others prefer a stick-bud method in July or August. The grafting and budding methods need the mist systems, or plastic enclosed benches to maintain high humidity and prevent dessication before the union heals.

Understock used commercially varies from 1/8 inch to 5/8 inch. We have seen propagators use even larger. Most use the side graft method, but some use the cleft graft on well established large size understock. Some grafters like to place the graft about ground level, some at 4 to 6 inches up. Of course, many of the dissectum group are worked on high standards.

We bring our understock in the greenhouse in October, keep it cold, and a little on the dry side, until we heat the houses the first part of January. As the understock buds break dormancy, grafting is started. Some nurseries like them leafed out fully, but we like about one-half inch new growth. Scions are collected in plastic bags and refrigerated in January during full dormancy. So many papers have been presented on the grafting of *A. palmatum* that more detail is unnecessary.

Disease control and sanitation is essential. Verticillium wilt is one of the biggest threats in production of maples. It is widespread in native stands of *Acer* throughout the west, and must be guarded against in landscaping and nurseries. In landscaping death is often attributed to other causes, when the disease is often introduced into the plants by pruning or root damage. It can be easily introduced into the propagating nursery.

Sanitation of cutting tools while collecting scions or cuttings is imperative. Taking a scion from an infected limb can spread the fungus to other trees, and to scions collected at the same period. While shaping the scions during grafting, or making the cut in the understock, one can spread the disease down the grafting bench on later grafts. It is important to repeatedly sterilize the grafting tools during the grafting period.

Infected potting soils are another large cause of loss to the grower, after the grafts are transplanted. Sterile potting mixes such as bark-sand, or sterilized lining-out beds have great advantages.

Protection against tissue damaging insects such as root weevils must be carried out. They not only do mechanical damage to the plants, but afford a means of opening up entry into the plant for diseases.

Striking cuttings of these maples has been described for many years. Back issues of the Proceedings contain good procedures. Some nurserymen have reported dissatisfaction to me with plants on their own roots, feeling that the plants have less vigor after five years or so, than those grown on vigorous seedling rootstock. Some large nurseries, however, are now expanding their cutting-grown plants, and are producing very fine material.

A soft or semi-soft wood is preferred (during June, in Oregon). Higher strength hormone dips seem to work best. We have had good results with both the powder hormone and the liquid quick-dips. Bottom heat of 72 to 80° F is the preferred range of most growers. Mist systems, or totally enclosed plastic covered benches are essential to prevent dessication before new leaf formation. Gradual hardening off is important, keeping the humidity high. Excessive heat becomes a problem with plastic enclosed benches. The rooting medium varies with growers, from sand-peat, peat-perlite, to straight perlite.

Striking the roots is not the difficult part. If the cutting goes into full dormancy in the fall, following leaf and shoot growth, it is often difficult to get them to break dormancy in the spring. Some successful growers keep the rooted cuttings growing vigorously through the first winter period and on to the time of lining out in the spring. Severe losses have been reported on cuttings that go dormant.

Maples such as *A. ginnala*, *A. buergerianum*, *A. davidii*, *A. capillipes*, *A. campestre*, *A. sieboldianum*, *A. carpinifolium*, *A. crataegifolium*, *A. micranthum*, *A. maximowczii*, and *A. mono* are easily propagated from seed. When we get into the desirable clonal variations of the species, grafting becomes necessary. Cuttings have been successful on a few. They are best grafted on their own species rootstock, of course.

The beautiful species *A. griseum* presents a problem. Cuttings are extremely difficult. Although it sets heavy seed crops, much of the seed is not viable. I have collected and sampled bushels of seed only to find that most of it is hollow. Some individual *A. griseum* trees set good seed but tend to be rather rare. Grafting of *A. griseum*, as well as *A. mandschuricum*, *A. pentaphyllum*, *A. orientali* and a few others is difficult from the standpoint of suitable understock. Usually we try and stay within the species. We hope to be able to report on the successful grafting and propagation of some of the more rare maples at another time.

TED VAN VEEN: We have time for just a few questions for any of our speakers.

VOICE: Mr. Vertrees, did you soak the maple seeds at 120° F?

J. D. VERTREES: 100° F; just good warm water, then just let them cool.

WES HUMPHREY: Mr. Vertrees indicated the use of methyl bromide for control of verticillium wilt. But I wondered if he meant, rather, chloropicrin for this use rather than methyl bromide. At least, as I understand, methyl bromide does not have much effect on the verticillium organism.

J. D. VERTREES: That's right. I could show you some literature that says it does and some literature that says it doesn't. To answer your question specifically, I'm using a mixture of chloropicrin and methyl bromide.

WILLIAM CURTIS: We have some more questions from the Question Box. The first, how do you root *Prunus tomentosa* cuttings? We had this question last night but no one had the answer. Later one party stopped me and said, "I dig up the plants and put them in the greenhouse and when the side shoots come out, I take off the shoots and then put them in straight sand with bottom heat and they root very readily." He hadn't any more finished telling me that when Rudy Wagner told me the same thing. He said, "I don't know why I

didn't answer the question, but," he said, "that's the way I handle it."

WILLIAM CURTIS: Where can I buy granite grit?

VOICE: At the feed store. Turkey grit number two. At any reliable feed store that's still in business.

WILLIAM CURTIS: How do you control algae under a mist system without discouraging rooting?

DAVID ADAMS: I think probably the easiest way to do that would be to make sure that the whole bench area is well sterilized before you start; and between each crop, if you've got steam, cook it good. Granted you're going to get algae back before the crop is out of there but if you don't clean it up you're in trouble.

ANDY LEISER: We never were able to control it as long as we used our tap water, which is high nitrate, high boron, high calcium carbonate, etc. It's rather expensive but we've gone to deionized water for our mist system in the greenhouse. Now we're pretty well free of algae.

WILLIAM CURTIS: The rooting of hardwood cuttings of *Prunus cistena*. Is anybody growing *Prunus cistena*?

DAVID ADAMS: According to Frank Schmidt, I think he roots all his right in the field.

WILLIAM CURTIS: Thank you, Dave. Union Carbide Company has a granular size insecticide called *Chemic* or *Ambush*. Has anyone had any experience with this? Registration is possible in California. Does anyone use *Chemic*?

ROBERT TICKNOR: It was quite a few years ago, when it was a numbered compound, we used it on birch for birch leaf miner. It did a fine job on that but the problem was the trees didn't go dormant in the fall. The leaves didn't drop off and the grower couldn't dig them at the normal time.

WILLIAM CURTIS: So *Chemic* held back the dormancy?

ROBERT TICKNOR: Right. The trees stayed green longer.

RICHARD SMITH: I'm speaking for the Andersons who already left. At lunch time there was talk about this. They commented that it seemed to have been very poisonous. The people who worked with it had mint julep and the mint had grown where they had put this *Ambush* on the ground. Later Mrs. Anderson was taken to the hospital that evening very ill from supposedly the effects of the mint roots absorbing this *Ambush* from the ground.

WES HUMPHREY: Bill, could I add a comment along that line? It is a systemic insecticide, a miticide, that has an extremely low LD50. In other words, it's poisonous as the devil. Its LD50 is less than one milligram per kilogram of body weight; in other words, it's a very poisonous material. That's the reason it's only available as a 10% granular material. It may find some use in the ornamental field

but, as indicated, it is to be handled with a lot of good common sense as any hot insecticide needs to be handled. Highly effective on some sucking insects but no panacea.

WILLIAM CURTIS: What pines are compatible as understock for grafting? Are all two-needle pines compatible with other two-needle pines? Who grafts two-needle pines? Who grafts a lot of pines? Well, for many years, it's been said in the trade that you had to graft two-needle pines on a two-needle pine, and a five-needle pine on a five-needle pine and so on like that. But there's an old gentleman on the coast down in Washington who said that's all poppycock. He grafts everything on our coast pine and he has no problem whatsoever. In the meantime, Goddard's, they believed this man, because they saw what he was doing and they're doing the same thing and they have no trouble. A couple of years ago, I took some pines over to Bill Omar. I used to do a lot of grafting myself, but then I got so busy, I didn't have the time to stay with it. And Bill realized after he had some eastern white pine grafted on some coast pine what he had done. But I couldn't see any difference, they survived. So I don't know whether it makes any difference or not.

ANDY LEISER: I've got some dwarf Japanese white pine that have been on Scotch pine for about 15 years and so far I don't see any incompatibility. One thing — it is not two-needle versus otherwise, because there is a one-needle white pine, a two-needle white pine, a three-needle white pine, a four-needle and a five-needle white pine, and there are two-needle to eight-needle yellow pines — but the old saw was to graft yellow or black pines on yellow or black and white pines only on white pines.

WILLIAM CURTIS: Is budding practical to multiply scarce rhododendron varieties?

VOICE: It's been done — taken in June with very good success. It's a quick way to get more of them.

WILLIAM CURTIS: The next question — why do they not undercut the walnut understock after the first season? Harry Lagerstedt mentioned yesterday that the stock got so big in two years there was difficulty in grafting it.

HUDSON HARTMANN: In California we don't have that as a serious problem. The seedlings grow fast enough the first year so we can handle them by patch budding in the fall. Or if the seeds are planted very close together — 6 inches apart in the row — this prevents the seedlings from getting excessively large. Another solution would be to undercut the first year to hold them back.

WILLIAM CURTIS: Another question — why not use Tree-Heal and no tape in grafting walnuts: This question was brought up yesterday by the comment that the pressure of the wrapping tape inhibited callus formation.

HUDSON HARTMANN: The common practice in California

when whip grafting walnuts is to wrap the unions tightly with cloth adhesive tape and put a lot of pressure on it. They heal very well; this is the way they are handled commercially. After growth starts, then the tape is slit so as to release the pressure, otherwise there is harmful constriction and girdling.

WILLIAM CURTIS: Well I know in grafting flowering cherries, we taped them with cloth tape and, as the callus grew, and maybe grew over a little bit, there was a tendency to kind of mold it and have a nice, smooth union. We would wait until it got full and tight, and then we would split the tape if it didn't split itself.