	around evergreen and deciduous azaleas, forsythia and young magnolias.
ROUND UP (glyphosate) (½-1 oz/gal aia) E	Useful in control of morning glory (*Convolulus arvensis*) as spot spray. Use at least 2 times the concentrations of Paraquat. Needs at least 6 hours before a rain to work.
RONSTAR 4G (oxadiazon) (2-4 lbs. aia) C, S	The best new control for bittercress (*Cardamine oligosperma*). Foliage must be dry. Some damage to some broadleaves in tender growth. One of the more safe chemicals for small containers.
SINBAR (terbacil) (1 lb. aia) C, S, E	Use in combination with amitrole for a strong combination to use for non-selective killing.
SPIKE (2-3 lbs. aia) C	Non-selective killer for can lots and driveways. Avoid plant root systems. Long lasting. *Juniperus sabina* 'Tamariscifolia is tolerant of this at low rates.
SURFLAN (Oryzalin) (3-5 lbs. aia) C, S	A better weed control than Treflan. Used mainly for grasses. Used in combination on containers.
TENORAN (chloroxoron) (3 lbs. aia) C, S, E	Good control on fireweed (*Epilobium angustifolium*), groundsel, and bittercress. Not very effective on grasses. On new plantings in the field, use 3 lbs Tenoran with 2 lbs Simazine and 1½ lbs Kerb. On established weeds in the fall, use 3 to 4 lbs Tenoran with 1¼ lbs Atrazine; or 3 lbs Tenoran and 1½ lbs Amino triazole. On containers, use in combination with ½ lb Simazine and 3 lbs Tenoran on conifers and 2 to 2½ lbs on broadleaves. Kerb at 1½ lbs may be added for grasses in fall and winter. Causes some damage to broadleaves, especially when they are in new flush of growth. Reduce the concentration for use in plastic houses and during hot weather.
TOK (nitrofen) (2-4 lbs. aia) S	Our Pacific Northwest weather is usually too cool to use it effectively. Goal appears to be much superior for our use.
TREFLAN (trifluralin) (2-4 lbs. aia) C (incorporate)	Does not work very well in our weed control program.

NOTES ON PROPAGATION OF CERTAIN *ACERS*

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Much has been written and spoken over the past two decades on the propagation of "Japanese Maples." The indices of the IPPS Proceedings and of the *American Nurseryman* will re-

veal this. Even so, we continually receive requests for information on recent propagation procedures for production by seed and by asexual methods. As I accrue information from successful propagators across the U.S. and in other countries, I am increasingly impressed by the variations in methods and procedures.

This fact of procedural variation should be stressed, along with the fact that completely differing procedures do not indicate that one propagator is more correct than another. It simply means that there are several successful variations, and that these should be adapted to the particular needs of each propagator as to his particular time, facility, and condition of plant handling.

SEED

Variation in seedling germination in the Series *Palmata* seems to be quite disappointing with some producers. It is my experience that success in germination is directly involved with the dormancy of the seed when it is put into stratification. Seed from some local sources, and especially dried seed from overseas, will be quite dormant. We have experienced dried seed from Japan that germinated annually in seed beds over a five-year period, even though the seed had been pre-treated and stratified in the normally accepted procedure.

With *Acer palmatum*, and others of the Series *Palmata*, we collect our local seed while it is still rather green. In our area this is usually about mid-September when the "wings" of the seed are brown, but the nutlets are still green and the samara will separate quite easily. This will vary in timing with different stock plants and among sub-species. *A. japonicum* usually is slightly later in reaching this stage of development. Our native species related to "Japanese maples" — *A. circinatum* — will give excellent germination when picked with the entire samara still green (perhaps in late August). Dried *A. circinatum* seed can be very erratic in germination.

After the seed is picked, it is immediately cleaned, the samara separated, lightly dusted with Captan or equivalent fungicide, and stratified. We mix equal parts of moist (not wet) peat moss and cleaned seed. This is then tied tightly in a plastic bag, labeled, and stored at 1 to 4° C (34 to 40°F.) for at least 90 to 150 days. We then plant in seed flats or in outdoor seed beds. The seed may be sown directly in seed beds outdoors in the fall immediately after picking and cleaning. The beds must be strictly guarded against soil fungi, soil insects, rodents, etc.

When using dried seed from other sources, a pre-stratification soaking is important. We soak seed for 48 hours,

starting with water at about 43°C (110°F.) covering the seed. The container is kept in a warm room, letting the solution gradually cool to room temperature.

We find that such species as *A. davidi*, *A. capillipes*, *A. tegmentosum*, *A. maximowiczii*, *A. micranthum*, *A. buergerianum*, *A. truncatum*, and A. truncatum var. mono (Syn: *A. mono*), all respond to the procedure of stratifying semi-dry seed. High percentages of germination result when the seed is harvested with a slight green color remaining in the samara.

When very dry seed is received, the 48-hour soaking in warm water will speed up the germination rate the first year. Even so, in these species, some germination will take place the second season. We received several pounds of *A. buergerianum* seed from Korea which was not only very dry but arrived in late summer, too late for our planting schedule. That fall the seed was soaked and stratified. About 20% germination occurred the first spring, but the following season a very heavy germination took place.

In the Series *Grisea*, seed production is even more frustrating. I have soaked, heated, dried, acidified, frozen, or used a combination of the above prior to stratification. No increase in germination was apparent. The only germination took place after the second spring following treatment. We try to collect seed before the nutlet turns brown. We stratify in damp peat moss for at least 150 days at about 35°F. Planted in seed beds, or in flats, we experience very little germination the first season (less than 1%). Left undisturbed, we get very good germination compared to the amount of viable seed planted. *Acer triflorum* and *A. nikoense (A. maximowiczianum)* respond the same way. Extremely dry *A. triflorum* seed from Korea germinated very well the second season. It had pre-treatment and stratification prior to planting.

GRAFTING

Grafting remains the predominant method of propagating the many cultivars of "Japanese maples" and varieties of other Asiatic species of ornamental value. It is true that some propagators use budding, layering, and air-layering. Some of these methods are more tedious than side-grafting, while some are limiting in volume because of the procedure.

The standard side or veneer graft is easily accomplished. The care and attention to the understock preceding grafting and close care and culture of the plant after grafting are most critical. Probably the majority of "Japanese maple" grafting in the U.S. is done during the dormant season. Some propagators start in late November or December; others graft in March. We find

mid-January to February a good time for us, although this cannot be too late because our scions on the outside stock plants begin to break dormancy in late February. We prefer to use fresh-collectd scions, although they can be refrigerated fairly successfully for a short time.

Summer is the second most popular time for grafting in the U.S., but the most preferred in Holland. The mechanics of the side-graft procedure is about the same, but the pre-grafting handling of the understock is, of course, different. After finishing spring growth, potted understock should be dried somewhat to establish "summer dormancy," and should be kept dry prior to grafting. As soon as the graft is made we immediately place it under an automatic mist system which prevents any dessication until the callus forms. We do not "wax" in summer grafting. Scions are collected fresh as grafting progresses. We prefer not to store scions for more than an hour or two in summer grafting, even under refrigeration.

There are advantages as well as disadvantages in both time-methods of grafting. Propagating schedules on other nursery items may influence the choice of time. Both methods are extremely successful.

CUTTINGS

"Japanese maples" have been propagated by cuttings for at least two or three decades here in the U.S. There are still differences of opinion among some nurserymen as to the vigor of the plant (several years after propagation) which was cutting-produced. There needs to be further serious study of own-root vs. grafted plants with many of the cultivars of *A. palmatum*.

Our trial with *A. palmatum* and its cultivars was for two purposes: (1) to study the growth habits of cutting vs. grafted plants of the same cultivars for a period of years; (2) to produce certain cultivars on own-roots for bonsai fanciers who object to the appearance of the graft union on dwarf types.

We have data from many propagators who show success in rooting cuttings at various times of the year. We find reports of success with dormant January cuttings, late dormant March cuttings, semi-hardwood in June, and late summer in August.

Most of our recent trials were in the late June, semi-hardwood period. Cuttings were current season growth, stripped of the lower 3 or 4 pairs of leaves, with only the tip pair remaining. After the slanted end cut, light wounding was made about ¾ inch long, and immediately dipped in a rooting compound (Hormodin #3; 0.8% I.B.A.) which consistently gave better results than other commercial dry compounds.

The cuttings were inserted in a 90:10 perlite/peat moss mix under an automatic intermittent mist system. Bottom heat cables supplied heat at 70°F (22°C). Rooting in all cultivars was sufficient for repotting in 6 weeks.

Twenty-four cultivars of 50 cuttings each were in the trials. All were successful, but the most dwarf cultivars rooted poorly at about 40%. The more upright cultivars ranged from 70 to 100% well-rooted. While there may be a relationship to the growth habit of the cultivar, it is also possible that the stage of maturity among these widely varying cultivars was an important influence.

Trials were also included on some of the lesser known species of *Acer* to obtain comparative data. In some cases we needed information on species which are difficult to graft, or for which we cannot find compatible understock species, or for which it is difficult to obtain seed, and finally those about which we were just curious as to their development as cutting produced plants.

Cuttings were treated and handled as in the brief description given above in the latter part of June. Rooting results are as follows:

A. acuminata — 50%
A. buergerianum — 95%
five various cultivars of *A. buergerianum* — 75-95%
A. campestre 'Compactum' — 25%
A. campestre 'Pulverulentum' — 90%
A. carpinifolium — 90%
A. coriaceum — 0%
A. crataegifolium — 100%
A. crataegifolium 'Veitchii' — 75%
A. fulvescens — 0%
A. lobellii — 90%
A. monspessulanum — 50%
A. morrisonense — 95%
A. orientale — 20%
A. pentaphyllum — 30%
A. pycnanthum — 50%
A. syriacum — 100%
A. truncatum cultivars — 0%
A. truncatum var. mono cultivars — 0%
A. tschonoskii var. rubripes — 100%

It is felt that several of the failures were due to the variance of plant growth at the time of sticking the cuttings. Some were perhaps too mature and some too soft. Expanded date-trials are planned. Also, from previous experience it is felt a higher percentage of success will result from the use of liquid hormone dips or soak containing 1.0% IBA.