

past 8 years has tolerated temperatures of -30°F at three different locations. Vegetatively propagated selections of *P. floribunda* should therefore make excellent additions in climates where many ornamental plants cannot survive the cold. Also, cultivars propagated from single clones would provide the uniformity that is so often desired in landscape design.

QUESTION BOX

The question box session was convened at 3:30 p.m. with Mr. Ben Davis II and Mr. Ralph Shugert serving as moderators.

MODERATOR SHUGERT: Have any useful fruiting (not just ornamental) cultivars of *Malus* been rooted?

PETE VERMEULEN: Yes, we rooted a number of cultivars several years ago and I believe these were reported in the *Proceedings*. We are not doing it now because we have quit growing the crabs. If the person who posed this question will search through the past literature and especially that of the *Proceedings* I am sure they will find quite a bit of information.

MODERATOR SHUGERT: Charlie Heuser, what compounds can be used for the promotion of adventitious buds on root cuttings?

CHARLIE HEUSER: The three most common materials used are kinetin, benzyl adenine, and 2-IP.

MODERATOR SHUGERT: When cuttings of some deciduous contoneasters are taken late in the season with the foliage still on and green, they root well and quickly under mist, but after hardening off they gradually drop all their leaves and never come back again. What takes place here?

PETE VERMEULEN: This sounds like a question of how they were handled after they were rooted. If they were kept in a warm greenhouse their dormant period would not have been satisfied. If, however, they were put in cold storage they would probably go through the winter and break normally in the spring.

MODERATOR SHUGERT: Are clematis cuttings made of soft, intermediate or harder growth; what is the best hormone, time of year, etc.? Bill Cunningham has reported on this and it is in the *Proceedings*.

RAY EVISON: In England we use juvenile tissue selecting the cuttings where the leaves have just fully formed and before the wood has started to harden up at all. You can use slightly harder wood, but then it takes longer to root and you don't get

as many roots. We use single noded cuttings, while here in the States I notice that double noded cuttings are used. We treat the cuttings with Seradex #2.

MODERATOR SHUGERT: Is anyone successfully rooting the following *Juniperus chinensis* cultivars: 'Mountbatten', 'Ames', 'Maneyi'? What procedures are used?

JOERG LEISS: We take cuttings of 'Mountbatten' in September and get about 70% rooting, we restick the unrooted ones and get a total of about 90% rooting. As a group the *J. chinensis* cultivars don't respond to bottom heat so it is best to take the cuttings in September and stick them in an unheated greenhouse without bottom heat; if you use bottom heat you just get a lot of callus.

MODERATOR SHUGERT: What is the best way to propagate *Fothergilla gardenii*?

VOICE: I root them by taking softwood cuttings in early summer, treating them with Hormodin #2, and sticking them in peat-perlite under mist.

MODERATOR SHUGERT: How do you root *Acer griseum*?

CASE HOOGENDOORN: If you take cuttings from an old tree practically none of them will root. I bought some 2 year old seedlings and we took cuttings off of them. We take the cuttings about June 26 when they have just about stopped growth. The first year we got about 80 to 90% rooting, but in later years we get 50 to 60%. I think if you can get 50% rooting you are doing very good.

MODERATOR DAVIS: Bruce Briggs' how do you propagate *Acer palmatum*?

BRUCE BRIGGS: From seed. We pick the seed in the fall before it is fully ripe. You can sow the seed immediately or stratify for 60 days, but don't let the seed get dry; either way you should have a good stand in the spring. We don't graft maples anymore; we checked our costs on this and found we were not making any money.

MODERATOR DAVIS: On what understock can *Pinus pumila* be grafted with good success?

DAVE PATERSON: We grafted on *Pinus strobus* with very good success.

MODERATOR DAVIS: When we graft the long needle form of *Pinus pumila* on *Pinus strobus* it takes well as a graft but then dies out for some reason when planted out, particularly in the second year after grafting from an apparent incompatibility. Any ideas?

BRUCE BRIGGS: I'd say you should go back to *Pinus contorta* or *Pinus contorta* var. *latifolia*, which is the Lodgepole pine. We find that these two are compatible with almost all of the pines and we graft them with no indication of incompatibility.

MODERATOR DAVIS: When grafting spruce and other conifers, what is the accepted timing on cutting back the understock? Is it cut off completely after the scion has callused or is it cut gradually as the scion grows?

CASE HOOGENDOORN: We cut part of it back at the time of grafting and then when they come out of the bench we cut back a little more and when they go into the cool house we cut back the rest of it. We cut them back gradually.

PETE VERMEULEN: Some people cut back at time of grafting, at lifting, and at time of cutting. We cut back only 2 times; we take off about half at the time of grafting and we remove the remainder at the time of transplanting.

MODERATOR DAVIS: What is being done to reduce the adventitious shoot production and basal sprouting of crabapples which is a tremendous maintenance problem in the landscape?

BRIAN HOWARD: Because of the tremendous labor involved in rubbing out the eyes on understocks of crabs there is some work being done now to control this with chemicals; primarily NAA, is being sprayed on the trunks to control suckering.

MODERATOR DAVIS: Would Case Hoogendoorn discuss grafting *Cornus florida* 'Rubra' during the month of September?

CASE HOOGENDOORN: We graft on *Cornus florida* on stocks that were potted the previous spring and the grafts are made in September or during the winter. We cut off the stock about 1 or 1-1/2 inches high and take a scion that has just about stopped growing and graft it in. The grafts are put in a grafting case and covered with sand and they callus very rapidly.

MODERATOR DAVIS: Is successful grafting possible for *Acer griseum* and *Acer micranthum*?

CASE HOOGENDOORN: I tried grafting *Acer griseum* on the green Japanese maple; they callused but they they all died. I tried about a half dozen other understocks but none of them worked. Roger Coggeshall told me that several years ago he tried 26 different understocks and none of them worked.

MODERATOR SHUGERT: Mr. Van Slooten would you describe your hardening-off conditions and are the plants completely dormant when they are planted out?

MARION VAN SLOOTEN: The plants are dormant when they are planted out. We chill them for 6 weeks by dropping

the temperature 5°F per week from 70° to 40°F. They are held at the 40°F temperature for 2 months before outplanting.

MODERATOR DAVIS: Would chip budding work if done in winter in place of bench grafting?

BRIAN HOWARD: We hope that it can be used in place of bench grafting and think it is well worth trying. The problem comes in handling them; you have to work out a system of being able to use the knife on them in the bench the next spring to cut them back. For bench chip budding or spring chip budding we use a narrower tie and leave the bud exposed so they can grow through. I didn't point this out in my paper.

MODERATOR DAVIS: How are budders remunerated for their services?

RALPH SHUGERT: In Southern Ohio the piece rate for contract budding is \$45 per thousand; the budder gets \$23.50 and the tyer gets \$21.50.

MODERATOR DAVIS: What is the best time to bud weeping cherry?

JOERG LEISS: We graft rather than bud but I would assume budding could be done in August.

MODERATOR DAVIS: Dale Maronek, can a mycorrhizae population be established and maintained in the root system of a properly fertilized plant?

DALE MARONEK: We found that it is necessary to reduce the fertilizer rate since high fertilizer rate tends to inhibit the growth of the mycorrhizae; this is especially true for high phosphates.

MODERATOR SHUGERT: Plants of *Cornus nuttalli* that I received from the West Coast appear to be grafted on *Cornus florida*; why is *C. florida* used as an understock for propagating clones of *C. nuttalli*?

BRUCE BRIGGS: To get a better root system; it is compatible with *C. florida* which gives a much better root system.

MODERATOR SHUGERT: What is the best way to grow *Euonymus alata* 'Compacta' in cans; mix, fertilizer, etc.?

BILL CURTIS: You have to be very careful when fertilizing in containers, we've experienced fertilizer burning of the roots.

VOICE: We've grown them in cans using Osmocote with 60% bark and 40% sand and had very good results. We've also raised them using Peters 20-19-18 with good results.

MODERATOR SHUGERT: Has anyone had any experienced (good or bad) with the "spaghetti" tube system of automatic watering containerized plant materials?

VOICE: We've had very satisfactory results using the 0.60" x 3 ft Chapin tube system on 3 and 5 gal containers of 18" *Cotoneaster praecox* and *C. apiculata*. We've also used it on several of the dwarf junipers; our losses were about 2%.

MODERATOR SHUGERT: Mr. Van Slooten, in your accelerated growth program did you use a commercially packaged fertilizer or mix your own; do you use micronutrients with each watering, and what ppm of N, P and K do you use? Does this have to be monitored very closely?

MARION VAN SLOOTEN: We use packaged fertilizers and mix our own. As to micronutrients, we use Peters 20-19-18 which, according to the company, has micronutrients in it; they are not listed on the label but the company assures us they are in there. The ppm of N, P and K varies with the species we're growing and, yes, it does have to be monitored very closely.

MODERATOR DAVIS: Has anyone heard of the use of Tabasco sauce as an animal repellent?

FRANK GOUIN: There is a report in HortScience discussing the use of Tabasco sauce to keep deer and mice from eating plant materials. Tabasco sauce is a little expensive and Louisiana hot sauce does just as well; the current recommendation is to use 40 oz/100 gal of water. You do have to be careful of the sticker you use; the usual spreader stickers do not work. We are currently using Vapor Guard at 2 parts per 100 for winter protection and 1 part per 100 for summer protection. Where growers have used Tabasco and reported unfavorably I have found that they used the conventional spreader stickers and they just don't work. I have a new hot sauce that was sent to me and it is really potent; at present I am down to 2 oz/100 gal but it is still doing a good job.

MODERATOR DAVIS: Bruce Briggs, how do you use Clorox for sanitation of your cuttings?

BRUCE BRIGGS: We use it at the rate of 1:15; this is just to be sure the water is clean. When the water gets dirty we mix up a new batch, usually one in the morning and one in the afternoon. If it gets much stronger than this there is a chance of doing some damage to the cuttings.

MODERATOR DAVIS: How good is Kerb herbicide and can it be used around dormant deciduous shrubs for quack grass control?

RALPH SHUGERT: It is a fine product but there are few plants on the label. I think it has good potential for use on those plants that can't take Princep. I have heard of no damage from its use but also no control is obtained if it is put on after February 1. It must go on in early to mid-November.

VOICE: For quack grass I have to get it down in November or I get no control.

MODERATOR DAVIS: That completes all the questions in the Question Box. I thank every one of you for your cooperation and kind attention.