

been instrumental in the development of several student scholarships that annually grant about \$100,000 per year. He became Dean of the School of Agriculture at California Polytechnic University in 1974. After 5 years he returned to teaching. In 1983 he retired from full time teaching, but continues to teach part time, and is actively involved in many other activities related to horticulture. Our distinguished 1986 recipient of the Curtis J. Alley Award of Merit is Dr. Howard C. Brown, a long time friend of horticulture and the IPPS Western Region.

## QUESTION BOX

Moderated by Bruce Briggs and Ralph Shugert

BRUCE BRIGGS: How do you propagate *Juniperus scopulorum*?

VOICE: It depends upon the cultivar. Some are easy to root—others not. Use 6000 ppm IBA or 3000 ppm NAA. They take a long time to root, 5 or 6 months. Start them late in the season—November.

BRUCE BRIGGS: Do you use talc or the liquid hormone in your rooting?

VOICE: We use all liquid.

BRUCE BRIGGS: If you are rooting *Juniperus horizontalis*, *J. sabina*, and *J. chinensis*, do you take cuttings all at the same time for best rooting, or at different seasons?

VOICE: we start in late summer and early fall with *J. horizontalis* and *J. chinensis*, which are easiest to root, then we go into the more difficult ones later in the season; when it warms up in the spring we go back and finish the *J. horizontalis*.

BRUCE BRIGGS: In rooting our rhododendron cuttings, they do not root around the edges of the bench. What is the reason for this?

DUANE SHERWOOD: It could be due for one thing, to toxic effects of copper naphthenate in the wooden bench.

RALPH SHUGERT: How is the best way to propagate *Clematis armandi*—by seeds or by cuttings?

DUANE SHERWOOD: For seeds you should harvest and plant before dormancy sets in, otherwise it is difficult to overcome seed dormancy.

RALPH SHUGERT: What is the best way to propagate *Hydrangea anomala* subsp. *petiolaris*?

DAVID HILL: We use seed collected in December and germinated in January, then collecting cuttings from the seedlings. Cuttings taken from stock plants will also root.

RALPH SHUGERT: Is there some information on propagation of Pacific madrone (*Arbutus menziesii*)?

ED SCHULTZ: I noticed that seeds would start germinating around areas where madrone brush had been burned, so I concluded that the seeds needed the lye coming from the ashes, so I washed seeds with a strong lye soap, which may have given them a mild scarification. From this I received a fair—not good—germination.

BRUCE BRIGGS: There are articles in back issues of the PROCEEDINGS describing the burning of excelsior or straw on top of flats of seeds to promote germination, using the effect of heat to rupture impervious seed coats.

RALPH SHUGERT: Has anyone growing liquidambar observed variations from the typical pyramidal form?

PHIL BARKER: If you look at enough seedlings you will find variations, some spreading and some not. A useful variation was reported about 30 years ago in North Carolina that had neither flowers or fruit.

RALPH SHUGERT: Variations certainly can occur in liquidambar. A cultivar called 'Gumball' was introduced about 40 years ago in McMinnville, Tennessee by the U.S. Forest Service. The tree grew for about 10 ft. then formed a perfect round ball.

RALPH SHUGERT: Why do some palm seeds take a year to germination while other seeds will germinate in only 2 weeks?

DUANE SHERWOOD: I have heard that in all seeds the last thing to develop is dormancy. If you pick the seeds early enough it will have no dormancy. The palm seed effect may be related to the harvesting date.

RALPH SHUGERT: Explain the freezing of *Cornus kousa* seed in relation to germination.

I ran some tests on this—finding that freezing the seeds for 3 months, then soaking in water for 24 hrs.—gave excellent germination.

BRUCE BRIGGS: How is it best to handle *Daphne odora* in tissue culture?

BOB TICKNOR: We have rooted daphne conventionally best in a 20% compost and sewage sludge in the mix, as compared to straight perlite. We have not used tissue culture.

DUANE SHERWOOD: Some growers of daphne have found that they must add a lot of calcium to the soil to get them to grow.

BRUCE BRIGGS: Another thing—daphne plants seem to be short-lived in the U.S., which may be due to viruses. We do not have virus-free stock in this country.

RALPH SHUGERT: How do you harden off Japanese maple for the winter to prevent winter injury?

STEVE HOTTOVY: Reduce fertilizers, especially nitrogen, in late summer after budding to reduce growth.

RALPH SHUGERT: Where can we obtain effective, comfortable masks for spraying? Also, spray uniforms that are effective, yet relatively cool.

RALPH SHUGERT: I will answer this one. We use the very best respirator masks we can find, but it is still not likely to be very comfortable. We use paper coveralls, used only one per day then thrown away.

BRUCE BRIGGS: How effective is K-IBA, which is water soluble, compared to indolebutyric acid dissolved in alcohol?

ED WOOD: In tests we conducted with Bob Ticknor, there were slight differences in results, but K-IBA is more expensive, and the extra costs may not justify the better rooting.

RALPH SHUGERT: How do plants (or cuttings) behave at very high temperatures (95° to 115°F) under fog?

MARGARET SCOTT: We have had some experience with this in rooting cuttings. We found no adverse effects on rooting, provided we kept the humidity at a very high level.

PHILIP McMILLAN BROWSE: Cuttings of *Acer palmatum* and *A. japonicum* cultivars were rooted in July in closed, well-damped-down poly tunnels, without mist lines. Temperatures were well over 100°F, but they rooted and grew very well.

VOICE: Loblolly pine cuttings rooted very well at temperatures over 100°F but with 100% humidity.

RALPH SHUGERT: What is the average salary for the head propagator at a nursery—or what is an industry-wide average for this position?

RALPH SHUGERT: In my experience it would depend upon several factors: 1) experience in the commercial trade; 2) education; 3) track record at previous job; 4) part of the country you are in.