QUESTION BOX

The Question Box session was convened at 3 50 p m. with Ralph Shugert, Bruce Briggs, and Hudson Hartmann serving as moderators.

MODERATOR BRIGGS. Why shouldn't methanol be used to make an IBA solution?

MICHAEL DIRR: Methanol has been mentioned as a solvent for a lot of the auxins. You could use it if you want, however, I would shy away from it because it is wood alcohol Wood alcohol can cause blindness if ingested.

MODERATOR BRIGGS: What is Synergol?

MICHAEL DIRR. It is an English product that is an IBA-NAA COMBINATION.

ED LOSELY. I believe that the K salt of IBA is one of the primary ingredients in Synergol.

MODERATOR BRIGGS What are some sources of IBA and NAA?

MICHAEL DIRR My paper in the Proceedings will contain a list.

MODERATOR BRIGGS. What effect does sugar have on rooting of plants?

RICHARD ZIMMERMAN: My only experience is with tissue culture. In tissue culture we must have it. The amount is not important Ed Bunker has reported that with *Grevillea* they take very soft cuttings and drop them in a bucket of water containing ½ cup sugar per 2 gallons of water. The cuttings are left in for 30 minutes and then wrapped in newspaper overnight. He reported less wilting with the sugar treated cuttings.

GREG LLOYD. At Yoder Brothers it is standard practice to put sugar on the stock plants before they are harvested.

LEN STOLTZ: I have infiltrated mum cuttings with sugar and found no promotive effect. I would see sugar as adding a source of food for microorganisms in your rooting bed.

MODERATOR BRIGGS Question for Len Savella. How do you pot up your blue spruce cuttings and over-winter them? Are you still using this procedure?

LEN SAVELLA. After the cuttings have been rooted we plant them in flats containing a peat and sand (1:1) medium. The cuttings are returned to the mist for 2 weeks The rooted cuttings remain in the flats for 2 years and are then transferred to beds for approximatley 2 additional years before field planting. We are still using this method with the cultivar *Picea* 'Koster'.

MODERATOR BRIGGS: Has anyone used PVC pipe for bottom heat with the same results as Don Dillion?

TOM WOOD: A number of growers are using a low density PVC pipe in England with high speed hot water It does not degrade and lasts for years. I am not sure, however, if it is the same type as yours.

BRUCE BRIGGS. If you are using household PVC pipe be sure to keep the temperature below 120°F. Above that your pipe begins to swell.

DICK HENLEY. Black poly pipe has been used extensively in Florida. By the time they add on the cost of the stainless steel clamps it turns out that ½ inch PVC pipe is cheaper.

MODERATOR HARTMANN: What is the best way to propagate *Ptelea trifoliata*?

CAMERON SMITH· No problem. Collect the seed in the fall, store it in a refrigerator in damp peat, and plant in the spring

MODERATOR HARTMANN· Has anyone had success rooting cuttings of *Amelanchier canadensis*?

JIM MERCHANT: It has not been a problem with us. We propagate them outside under mist.

MODERATOR HARTMANN. Has anyone had luck rooting female selections of *Myrica pensylvanica*?

ELWIN ORTON. I have no problem rooting them in August with Hormodin 3.

MODERATOR HARTMANN: We have had problems grafting *Larix leptolepsis* and *L. decidua*. The understock dies. Does anyone have an idea why?

ROGER STOEL. They need dry feet in the greenhouse.

MODERATOR HARTMANN. What is a good method of rooting × *Cupressocyparis leylandii* cuttings?

TOM WOOD· In England there are specialist growers that root them every month of the year. The key is proper wood selection. As the wood is maturing it goes from green to straw to brown. If you take your cutting with ½ inch of the straw brown area you will get roots in about 6 weeks. From an energy point of view, March is the best month because you heat a bit for the first 6 weeks, and then natural warm temperatures occur. A fairly strong hormone is required.

MODERATOR SHUGERT. Using water from an open pond for softwood propagation can result in an algae problem What can be used to safely eliminate the algae?

HANS HESS: We had that problem and used a large industrial filter to cure it

MODERATOR SHUGERT· Is there any update on verticillium wilt research?

WILLIAM WOLFF· I asked the question because of my special interest in Japanese maples. Some nurserymen use wood chips and I am concerned about the potential spread of that disease Some years back I had a sugar maple that was diagnosed as containing the disease. I ground up the tree and test applied the wood chips to 25 container Japanese maples and successfully infected 18 of them. Needless to say, now I use only pine bark

MODERATOR SHUGERT· What is a good and safe herbicide to use on container Japanese maples?

RALPH SHUGERT: On a very modest number of plants I would recommend Ronstar at or slightly below label rate.

CLAYTON FULLER· We used a Devrinol and Ronstar combination without any toxicity this year.

MODERATOR SHUGERT· What effects do fumes from kerosene stoves have in propagation houses?

CLAYTON FULLER· Based on limited experienced after the first year, we threw them away One, during April, backfired and did not fire properly in a storage house. All the plants had come into soft leaf and the next day all the leaves were off

RALPH SHUGERT. Ethylene gas in an enclosed area is dangerous.

PETER VERMEULEN. We had damage from Tree Heet when used in an enclosed area to a large number of different plants.

MODERATOR SHUGERT: Is there a safe herbicide that can be used around *Tilia*?

AL MANBECK· Roundup or Paraquat is OK as long as you keep them off the tree We are also using Princep, Dimet, Dacthol, and Devrinol

MODERATOR BRIGGS. Has anyone had experience rooting cuttings with willow extract?

MAKATO KAWASE· We have found that willow contains a very strong unknown root promoting substance. It is still in an experimental stage and I can not make recommendations to the nurserymen In the crude form it has a synergistic reaction with IBA.

MODERATOR BRIGGS. What is the trick to successfully overwintering *Berberis thunbergii* 'Crimson Pygmy'?

DICK CROSS. We root them in the summer and by November they are well rooted After they drop their leaves we

dig and store bare root in bunches. The bunches are stored in boxes of slightly moist sand in a root cellar.The boxes are brought up in February-March and placed in a cool greenhouse at 50-60°F under benches and moistened everyday. After 10 to 14 days the buds start to swell. At this time the rooted cuttings are potted. In Iowa I saw a firm that rooted them in a bench and left them overwinter until they started to bud and then potted the plants.

MODERATOR BRIGGS: Has anyone rooted *Tsuga canadensis* from cuttings?

PETER DEL TREDICI: Clonal variation is very great. Some root very well as hardwood cuttings in January while others, such as *T.c.* 'Sargentii', can be rooted in the summer. IBA at 10,000 ppm works very well. Some respond better to NAA.

BRUCE BRIGGS: Do not expose the cuttings to too much light or you will burn them.

MODERATOR BRIGGS: Does anyone have a good method for rooting *Hibiscus rosa-sinensis* cuttings?

PETER KOSSOUDJI. We just make cuttings off stock plants, direct stick in a 2½ inch rose pot containing sphagnum and perlite (1:1), and place them under mist.

MODERATOR HARTMANN: Could someone describe the green leaf budding technique used with nut trees?

LEN STOLTZ: It is similar to T-budding except you do not make the cross-T. Instead you apply pressure to the stem after lossening the flaps. The shield is then first pushed down and then up When you let up, the shield is locked up tight. The bud is next wrapped tight. I have obtained 98% success with the technique.

MODERATOR HARTMANN: In irradiating several species of woody plants, both seeds and seedlings, to get mutations, what is the best X-ray dosage?

CHARLES HEUSER: I would suggest that a dosage curve be run for each species.

ELWIN ORTON: This type of treatment is not of value if the plant already has a large amount of variation. Large populations of seedlings might be better than messing around with radiation.

DAVE BAKKER: One should write to Agriculture Canada because they have already done some of this work.

MODERATOR HARTMANN: Assuming a seedbed area has been fumigated with Vapam, to what extent and how quickly would this fumigated area be reinfected with mycorrhizal fungi by natural processes?

DALE MARONEK. It depends on the location of your nursery. Many nurseries that are located in prairie areas with no natural stands of trees have to depend on inoculating their seed beds themselves. They can not depend on natural wind infection. With ectomycorrhizal fungi if you have a population of native species, chances are within the first year your seedlings will show some mycorrhizal development. With endomycorrhizal fungi this not the case. You have to depend on resistant spores in the soil that may take a full growing season for the roots to go down below the fumigation level and pull it back up. Actual dates are hard to pin down.

MODERATOR HARTMANN: Does anyone have information on how best to pasteurize peat moss?

ED MEZITT: I asked this question because when we stick *Kalmia* cuttings, the lower part sometimes turns black in about 3 days. Our Extension Service has come up with the theory that most peat is badly infected

ADRIAN BOWDEN: We sterilize it in a concrete mixer

CARMINE RAGONESE. Drench it with Benlate before inserting the cuttings.

HUDSON HARTMANN: There have been a number of articles in past issues of the Proceedings on pathogens in peat moss

MODERATOR SHUGERT: What is the minimum temperature for azaleas the first winter after rooting?

FRANK GOUIN: From root temperature studies we have found that the primary root will kill out at 18°F in azaleas. Also if the cambium at soil level is not mature at the first frost you often get stem splitting.

DAVE RICHARDS. Last year we put our azaleas in an unheated house for the first time. They were covered with microfoam in a poly house We lost about half with most damage along the edge. This year we are going back to using a low temperature heat at about 35°F. We expect the temperature to go down to about 20°F.

VOICE: The type of covering, clear vs white, will make a difference. In New Jersey we normally pot into a 3 inch pot in the fall and take them through the winter in a clear plastic house at about 35 to 40°F. Three years ago we direct stuck some material in late July in 1½ gallon containers. They were not touched and went through −14°F with no trouble. They had no heat but were in white poly houses I think we need to take a better look at no heat storage.

PETER VERMEULEN: We have two houses where the temperature is controlled. Both are clear poly and one is held

at 35°F and the other has the temperature maintained in the root zone at 20°F In both cases we have overwintered rooted evergreen azalea cuttings

MODERATOR SHUGERT. What future does the poly bag container have in the U S.?

FRANK GOUIN· The problem has been to get a good poly bag on the market. Machinery is a problem for automatic potting. My work has shown that you get better growth in the poly bag because as the soil loses water and shrinks the bag also shrinks. You get much more uniform moisture. Once we get a bag that will stand up over time and drain properly the cost of poly will dictate wider use. Few people handle the plants by the container so that is not a problem.

BEN DAVIS: At the Texas nursery meeting I visited a California company that is using the poly bag and has potting equipment to handle the bags

MODERATOR SHUGERT· How can I propagate *Fothergilla*?

MICHAEL DIRR. Very easy from cuttings taken in June or July and treated with 1% IBA as a quick dip. Watch when you overwinter them. Do not disturb until they have completed a normal dormant cycle

Friday Morning, December 11, 1981

Leonard Stoltz served as moderator of the morning session

TISSUE CULTURE FOR THE PRACTICAL PLANT PROPAGATOR — STATE OF THE ART

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Tissue culture has become an important tool for use by the commercial plant propagator. This technique offers a number of advantages including easier production of many difficult to propagate plants, rapid increase of newly introduced cultivars and the ability to propagate desired plants continuously or at any time throughout the year. When the micropropagation aspects of tissue culture are combined with appropriate indexing and explant establishment techniques, then tissue