

near Savoy is particularly late vegetating in spring, and matures its seeds (if crossed) as early as the second week in August. The Busey clone, an old tree in Urbana, has the very wide spreading branches sometimes seen on old specimens of this species. In 1971, it colored ahead of a large ginkgo that is one of its tree companions at the old Busey mansion between Elm and Green streets. All four clones are comparatively early maturing, and should be adapted where other less colorful cucumber trees are now grown, north through Zone 5, at least.

Some American nurseries, and Treseders' Nurseries (Truro) Ltd., at Truro, Cornwall, England, have previously grafted from *M. acuminata* 'Philo' and the Dunlap clone. Scions of these and the other two fall coloring clones will be available in season. It should be mentioned that all four clones have the greenish, inconspicuous flowers typical of *M. acuminata*. For yellow flowers, we can still graft or bud from *M. acuminata* forma *aurea*, or selected clones of the smaller *M. a.* var. *cordata*. I have not yet seen yellow magnolia flowers and yellow autumn foliage on the same tree, but by cross-breeding, we may ultimately achieve that combination.

MODERATOR FORDHAM: Harry Hopperton has a couple of plants he'd like to tell us about.

HARRY HOPPERTON: Here is a picture of *Corylus duplex*. This plant has a very nice dense growth habit and I think it has possibilities. Another plant, *Corylus calurna* is one I think we are overlooking too often; perhaps we should be using it instead of some of the honeylocusts. It has a very interesting branching habit.

MODERATOR FORDHAM: That concludes the new plants portion of the program, and I turn the meeting over to Bill Flemer.

BILL FLEMER: Thank you, Al, for your usual fine job. This completes the program portion of today's meetings.

FRIDAY EVENING SESSION

December 3, 1971

PLANT PROPAGATORS' QUESTION BOX

The question box session convened at 8:00 p.m. in the West Ballroom. Dr. Bill Snyder served as moderator.

MODERATOR SNYDER: We have several questions here, and though we seem to be few in number this evening what we lack in quantity we will make up for in quality. Many of these questions are directed to specific individuals and if they are not present, we will set

them aside in the event that they may come in later in the meeting. The first question is for Bill Morsink. Did you sterilize the cuttings of *Acer saccharum*?

BILL MORSINK: We sterilized the soil in which they are stuck at 180° F and this is very important. If we do not sterilize the soil we get only about 20 % rooting, whereas with sterilized soils using the right size cuttings we can get up to 90 % rooting.

MODERATOR SNYDER: Do you treat the cuttings in any way with a fungicide?

BILL MORSINK: I tried a few of these materials, but I found that the sugar maple is extremely sensitive to many of these fungicides. I did mention that the softwood on top of hardwood cuttings became infected at their base, but I have not determined what the fungus is as yet.

MODERATOR SNYDER: This question is for Tom Pinney and reads, "I've been having trouble obtaining good stands of *Betula alba* (= *B. verrucosa*) from seed. Would you outline your seed treatment for this genus?"

TOM PINNEY: Immediately after collecting the seed we check the germination. We germinate them under high temperature in the greenhouse using a germination box with bottom heat from cables and we run the temperature up to probably 80° F. We may add light and mist but this is not always necessary—it's primarily temperature, which is critical. Germination occurs in 7 days and one should be able to prick them off in 21 to 28 days maximum.

Some seed lots in some years will give very poor results and since we collect sufficient seed we can be choosy, we just throw poor lots out. It is possible that stratification or some other procedure might improve the germination of these poor lots, but we prefer not to fool with them. We store the seed over winter or from year to year by placing them in plastic bags and holding them at 34° F.

MODERATOR SNYDER: It has been reported from California that methyl bromide fumigation under certain conditions can cause a nutrition problem. Has anyone experienced this problem and is there a solution?

JOHN ROLLER: I have heard of the problem and it seems to be the formation of nitrites in the soil.

TOM PINNEY: John, I don't believe this is all of the problem; it may be the cause of some of it due to killing the nitrifying bacteria. The information which has filtered back to me is that there is a definite stunting effect which appears to be tied up with the micronutrients, and is not solely a nitrogen problem. This has been happening with some of the fruit understocks.

BRUCE BRIGGS: There was also some work where crown gall was present and, after fumigating with methyl bromide, the crown gall

became a lot worse in the fumigated soil. This could have been caused by killing some organism which was keeping the crown gall in check. Along these same lines I'm wondering if perhaps the methyl bromide fumigation may be killing off the mycorrhiza and the stunting results because the plant can no longer pick up the nutrients it needs.

MODERATOR SNYDER: Has anyone encountered a toxic exudate given off by the roots of one crop that will affect another crop on this soil? I am aware of the black walnut situation.

BILL FLEMER: I believe it was Ed Rex at Rutgers who found that English ivy used as a bedding plant or ground cover in beds of ericaceous plants give off some substance which gradually reduces the growth of rhododendrons, azaleas or mountain laurel and he thinks it is a toxic exudate.

RON GIROUARD: There is a recent publication entitled, "Biochemical Interactions Among Plants," which contains summaries of special reports and formal papers presented at a University of California symposium in 1968. Copies of this publication can be obtained by writing to:

National Academy of Sciences
 Printing and Publishing Office
 2101 Constitution Avenue
 Washington, D. C. 20418

MODERATOR SNYDER: Thank you for that information. I do know that there is a very toxic material in buckwheat seeds and hulls. If this material is incorporated into the soil it will cause a reduction in root growth, but the material is water soluble and will leach out readily.

DAVE BAKKER: There is a list available from Boskoop which gives information about plants which are compatible for successive plantings.

Undesirable Nursery Crop Rotation⁴
 (From: Horticultural Guide, 1965.
 Netherlands Government Publication)

CROP	INCOMPATIBLE CROP
Apple	Pear-Roses ¹
Azalea	<i>Calluna-Chamaecyparis-Clematis- Erica-Rhododendron-Taxus</i>
<i>Buxus</i>	<i>Azalea-Hydrangea-Rhododendron</i>

continued

<i>Calluna</i>	<i>Azalea-Chamaecyparis-Clematis- Erica-Rhododendron-Taxus</i>
<i>Chaenomeles</i>	<i>Malus</i>
<i>Chamaecyparis</i>	<i>Azalea-Calluna-Clematis- Erica-Rhododendron-Taxus</i>
<i>Clematis</i>	<i>Azalea-Calluna-Erica- Rhododendron-Taxus</i>
<i>Crataegus</i>	<i>Cotoneaster</i>
<i>Dicentra</i>	<i>Lonicera (Climbing form) Ribes</i>
<i>Erica</i>	<i>Azalea-Calluna-Chamaecyparis- Clematis-Rhododendron-Taxus</i>
<i>Fagus sylvatica</i> ¹	<i>Picea</i>
<i>Ligustrum</i>	<i>Hydrangea (Needle Conifers)</i> ²
<i>Malus</i> (Flowering Crab)	<i>Chaenomeles</i>
<i>Pear</i>	<i>Apple-Roses</i> ¹
<i>Picea</i>	<i>Taxus</i>
<i>Pinus</i>	<i>Azalea-Clematis-Hydrangea- Magnolia-Rhododendron</i>
<i>Pinus</i> ¹	<i>Fruit trees (Bacterial root (knot) gall)</i>
<i>Populus</i>	<i>Current (Red-Black) Fruit Trees</i> ³ <i>Ribes-Sambucus</i>
<i>Prunus laurocerasus</i>	<i>Azalea-Clematis-Hydrangea- Magnolia-Rhododendron</i>
<i>Rhododendron</i>	<i>Azalea-Calluna-Chamae- cyparis-Clematis-Taxus</i>
<i>Sambucus</i>	<i>Gooseberry</i>
<i>Syringa</i>	<i>Clematis</i>
<i>Taxus</i>	<i>Azalea-Calluna-Chamaecyparis- Clematis-Rhododendron</i>

¹Crop grown for a long period, over 5-6 years

²*Picea, Pinus, Pseudotsuga, etc.*

³Apple, Pear

⁴Editor's Note. Dave Bakker supplied the above information by mail after the meetings.

MODERATOR SNYDER: Jim Wells, this morning you mentioned using Paraquat for weed control in your nursery. What strength do you use and how is it applied?

JIM WELLS: I'm going to have to ask one of my young men to answer that for you, is Clive here?

CLIVE DEEBLE: We are using Paraquat at 3½ fluid ounces in 4 gal of water. We don't measure the spreader sticker very accurately. We simply use one capful per 4 gal.

JIM WELLS: We apply the material from knapsack sprayers with a flat spray nozzle. The material is sprayed right along the ground and it does require great care.

JOERG LEISS: I would comment that the new formulations of Paraquat have a spreader sticker in it and so you do not have to add it.

PAUL BOSLEY: Paraquat is a wonderful material but you must respect it. It will do for you just about what the old torch burners used to do. We use a 3 gal nozzle with an engine sprayer but you must be careful not to get the pressure so high that you get drift because this material will burn any green tissue it hits. One man can do a tremendous job of weeding using Paraquat during the summer. We caution the worker to wear appropriate protective clothing and not to smoke or drink without washing thoroughly first.

BRUCE BRIGGS: Concentration studies with Paraquat were run in our area and it was found that on hot dry days you could get by with as little as a ½ oz / gal, but on cool days you had to go up to 1 oz / gal in order to get good kill. The addition of spreader-sticker increased the kill on weeds which were hard to kill but did not help on easy-to-kill weeds.

MODERATOR SNYDER: John Roller, someone wants to know if you broke the callus off of the cuttings before resticking them?

JOHN ROLLER: Yes, I did, on the 'Burkii' and the 'Maneyi'.

MODERATOR SNYDER: Can pine such as Austrian and mugho be grown continuously without a dormant period? Since no one is volunteering any information, I will cite some experience I've had attempting to grow them under 8, 12, 16, 20 and 24 hour photoperiods without cold treatment. Under all photoperiods the plants died within one year if they were not given a cold treatment. Has anyone else had experience with these plants?

Al Fordham, would you go over your procedure for rooting hemlock?

AL FORDHAM: We take cuttings from 2 to 3 year old wood, and though we have tried many mixtures of auxins and fungicides, the quick-dip method with IBA and NAA has proven superior. We usually use sand and perlite as the rooting medium and the cuttings are stuck in late autumn either on an open greenhouse bench or under poly. It doesn't seem to make much difference.

MODERATOR SNYDER: What is the origin of *Populus nigra* 'Thevestina'?

JOERG LEISS: This plant comes from Morocco and we have found it to be very susceptible to canker. It grows very much like *P. nigra* 'Italica' although it is a little faster growing; we grow both of them.

MODERATOR SNYDER: Dick Cross, how do you root the 'Moonglow' juniper?

DICK CROSS: We take the cuttings in the fall, treat them with Hormodin No. 3 and stick them in a sand medium; about 70% will be rooted by March or April. We remove the callus on those not rooted, stick them back in the bed and almost all of these will root. We find 'Moonglow' to be the best globe-type.

MODERATOR SNYDER: Has anything been done further on the treatment of cuttings in a centrifuge to bring the natural hormones to the base of the cuttings?

RON GIROUARD: The original work was done by Kawase and recently he has reported that ethylene is being released during the centrifugation process. Kawase is of the opinion that it is the ethylene causing the rooting; plant physiologists do class ethylene as a plant growth regulator.

MODERATOR SNYDER: Leonard Savella, I have several questions for you; however, I think I can put them all together and simply ask you to outline your procedure for rooting pink dogwood, time of year, type of wood, etc.

LEONARD SAVELLA: We take the cuttings about June 6, which isn't too important. The main thing is that the new growth be about 5 to 6 inches long. Take the material into the greenhouse and make the cuttings, leaving just two sets of leaves on them; they should root in about 6 weeks. After they are rooted I prefer to put them in a 2¼ inch clay pot using the same medium that they were propagated in and then I stick them right back under the mist. In about 1½ weeks we see root action and it is then that we take them out of the mist. Just before winter sets in I put them in a small pit, cover the pots with about 1 inch of medium and cover the tops with 4 to 6 inches of salt marsh hay, which is kept very thin so that light can get down to the stem and the medium. Then the pit is covered with sash and that's all there is to it. About the middle of the next June they're set out in beds. I've heard lots of people say they don't transplant on their own roots, but I don't agree with this; I think they transplant very well.

ED LOSELY: Have you noticed any clonal differences in the root hardness of your pink dogwoods?

LEONARD SAVELLA: No, we haven't. I think that as long as you choose acclimated plant material you won't have any trouble.

MODERATOR SNYDER: Bill Flemer, how do you handle your pink dogwood and Japanese maples?

BILL FLEMER: We've given up softwood cuttings of both of these items. We have lost many blocks of pink dogwoods on their own roots while those grafted on white dogwood seedlings would show no damage. Several years ago we had a block of Japanese maples in plastic houses in containers and we had a very severe winter. When spring came we lost a good number of these and every one that was lost was on its own roots. We feel that they're not as hardy on their own roots, in our Princeton area, as when they are grafted.

CASE HOOGENDOORN: I had a similar experience with some 3 year old *Biotas*. (*Thuja orientalis*). During a severe winter all of those on their own roots were killed. The grafted ones were badly hurt but they weren't killed and did eventually grow out of it.

MODERATOR SNYDER: A grower in central Ohio can't get *Ginkgo biloba* liners to grow. They die either the first or second season. Can anyone offer any advice?

RALPH SHUGERT: This could be a problem of having a non-acclimated seed source.

BILL FLEMER: One other possibility is that this plant is very susceptible to herbicides when young—especially the dinitro herbicides.

MODERATOR SNYDER: Joe Cesarini, what is your after-care for grafted pines and spruces?

JOE CESARINI: We have fiberglass houses and the grafts are placed in these and left standing up. We heal them in with peatmoss or a peat moss and perlite mixture, just covering the union. We do not use sash or plastic over them, but on warm days we do syringe them and if it is hot we may have to syringe them several times. Once they start to grow we gradually cut the understock back and remove the peatmoss from the union.

MODERATOR SNYDER: Case, when do you take *Prunus x cerasifera* 'Thundercloud' cuttings and how do you root them?

CASE HOOGENDOORN: We take cuttings in the middle of July, treat them with a hormone and stick them in sand in an outdoor mistbed.

KNOX HENRY: We're using a little different procedure. We're sticking softwood cuttings about the 10th of June with 75° F bottom heat in the greenhouse and having excellent results. We're also having fairly good results rooting hardwood cuttings in the fall.

MODERATOR SNYDER: Does anyone know what the hardiness of *Pyracantha* 'Mohave' is?

JOHN ROLLER: It is reportedly hardy to —5° F.

MODERATOR SNYDER: How do you keep chickweed from growing in containers in the fall?

JIM WELLS: Casoron will control it.

MODERATOR SNYDER: Dick Bosley, do you leave your irrigation system set up in your storage houses and use them over-winter? Also, are all of your water pipes plastic?

DICK BOSLEY: Yes, the system is pressurized and is kept on, but generally the winter drying is so spotty that I use hand watering. Most of the pipe is plastic, but the fittings are metal.

MODERATOR SNYDER: Do you think there is hope for rhododendrons or azaleas for homeowners in western Ohio?

DICK BOSLEY: I assume they are referring to the alkaline soil condition and I would say yes if they are properly planted using sulfur and other materials to take care of the alkaline condition.

MODERATOR SNYDER: Have you had any experience which showed that container-grown nursery plants do not root well into garden soil when transplanted?

DICK BOSLEY: This is a problem which needs considerable study. I feel that we have to use a highly organic mix to successfully grow container plants. Some instructions on how to plant container plants might help. I also believe the use of wetting agents might help because water doesn't like to cross an interface.

MODERATOR SNYDER: Mr. Hancock, why do you consider it necessary to remove burlap covers during nights or cloudy days?

LESLIE HANCOCK: I am reminded of an answer Bill Curtis once gave. He said "When I see a good thing, I stick with it" and that's the only reason I can give you. I get excellent results using this system; I've used mist systems along side of it and the cuttings are always far superior under the burlap covers.

MODERATOR SNYDER: What was the rate of Benlate which caused the injury to the plants in the west?

BRUCE BRIGGS: I believe they are referring to the poinsettia work and they found injury at 8 oz / 100 gal on poinsettia. This rate caused damage to the ends and some stunting. They found they could get just as effective control with 3 oz / 100 gal without getting damage to the plants.

MODERATOR SNYDER: Joerg Leiss, should tree peony grafts be lined out in the field in the spring or kept in the cold frame for a year and a half?

JOERG LEISS: We keep them in the cold frame until the fall of the following year, peonies only make roots in the fall so there is no point in planting them out in the spring.

MODERATOR SNYDER: Would Mr. Ravestein please explain his experiences in irrigating rhododendrons and azaleas during the winter months.

JOHN RAVESTEIN: We put some plants in containers in a plastic house during the winter and when it gets real cold I go in and irrigate them. If water is not frozen it has to be at least 32° F so if the temperature goes down to say 8° F outside and I water the plants in containers (and I really soak them) the temperature will rise. The temperature in the can will gradually start going down and about 10 days later I'll water them again. One section of plants did not get water and when spring came these were all dead. The others were all in good shape.

E. STROOMBEEK: Since John told me about this, I've been trying it and every 3 or 4 weeks I take a couple of plants out and let them thaw out and thus far they appear to be in perfect shape. If I take out a can which is saturated with water and one that has not been watered, the one which is saturated will thaw out first. I'm still following this program of winter watering and so far it looks very good.

JOHN HAVIS: I am very interested in this information, but would like to have a clarification. Can you do this watering when the temperatures in the house are very cold, say below 20° F or even 10° F or do you have to have a mild day when the temperature in the greenhouse has risen to above freezing?

JOHN RAVESTEIN: We try to time the waterings at about 3 to 4 week intervals. The irrigation is usually done when the temperature is 27° F to 28° F outside. I have kept some records of the temperatures outside, inside, and in the can and, shortly after watering, the difference between night temperature and day temperature will only be 6° to 8° F in the can but when we get about 3 weeks away from the irrigation time, the temperature in the can may go down as low as 18° F during the night and get up to as high as 28° or 29° F during the day. The watering maintains a more uniform temperature in the can.

MODERATOR SNYDER: With more and more container stock being grown in the Northeast and being protected with poly through the winter, disposal of these vast quantities of plastic has become quite a problem. With the tightening of pollution laws, burning is frowned upon and garbage dumps and land fills in our area refuse to accept this material. Do our members have any suggestions on how to dispose of it?

HUGH STEAVENSON: One fellow I know had a very simple solution to this. He simply wraps his stock in it and sends it to the other fellow.

RALPH SHUGERT: To add to Hugh's comment, we take it off of

the house and put it back on pipe or paper rollers and use it to line our shipping boxes.

VOICE: Why not use it in the soil mix?

BRUCE BRIGGS: If you leave it out in the sun for a while, a shredder will shred it up very nicely for use in a soil mix.

MODERATOR SNYDER: Has anyone used calcined clay for potting mixes or as a propagating medium?

KNOX HENRY: This past summer we used it for a rooting medium for softwood cuttings. We compared peatmoss, perlite, sand (1:1:1v/v) with peatmoss, perlite calcined clay (1:1:1v/v) and we found very little difference between them.

ARIE RADDER: We mixed it with peatmoss and tried to root rhododendrons in it, but it did not perform very well because it has a very high pH.

RALPH SHUGERT: I believe there is a report on this material in Volume 16 of the Proceedings.

MODERATOR SNYDER: That completes the questions in the Question Box and I now turn the program back over to our President.

PRESIDENT FLEMER: I wish to thank you all for your participation in this session of the Question Box and I now declare this meeting closed.