

3. Molin, N., L. Satmark, and M. Thorell. 1963. Pyrocarbonic acid diethyl-ester as a potential food preservative. *Food Tech.* 17:119-123.

MODERATOR PINNEY: Is Baycovin commercially available?

R. A. FLEMING: Yes, the material is available through Stauffer Chemical, or Pfizer Chemical, or any place that sells supplies for home winemakers.

MODERATOR PINNEY: What diseases will this material control?

R. A. FLEMING: Baycovin apparently controls all soil-born diseases. We especially like the easy application of this material.

MODERATOR PINNEY: The next speaker is no stranger to this group; he comes from Minnesota and this afternoon will tell us about "The Storage of Conifer Scions and Cutting Material"; Mr. Dick Cross.

## STORAGE OF CONIFER SCIONS AND CUTTING MATERIAL

RICHARD E. CROSS

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In the area where we have our nursery in Minnesota most conifer propagation is done during the winter months. If it were possible I would start in November and December, but because of pressures from tree and shrub digging and from Christmas business, it is usually about the first of the year before we get into greenhouse propagation.

Quite a few years ago, when I was new at making cuttings and grafts I read all the material I could find on the subject of propagation. I was under the impression I should take cuttings and scions and use them in a very short time, certainly within several days. This would be fine if we were in a mild climate where we would be able to go to the field and take fresh propagation materials daily.

About 6 years ago I began to wonder about the difficulty we were encountering in gathering cuttings and scions in January, February and March to get fresh material for our use. Also some winters there was winter damage to the cuttings, showing up after these later cut materials were used and put in the greenhouse benches.

As I thought about this difficult situation, with frosted hands and frozen feet, I could not help but feel that we needed a change in our procedure. I decided to try something different. The next fall in late November I cut about 30 bushels of cuttings for a trial experiment; most of them were junipers, *Thuja* and *Taxus* with several varieties of each. They were cut with pruning shears about 6 to 8 inches long and packed in bushel baskets, 500 to 800 cuttings per basket depending on the kind. They were then taken to our old root cellar and placed on the floor; they were left in the baskets until used.

The temperature in this root cellar ranges from 32° to 35° F during the winter months with no cooler or fans running. I am careful not to get these stored conifer materials wet with the hose. If possible I do not take them while wet. If they are wet when taken, I dump the baskets and dry them somewhat, before leaving them for long periods of time. Occasionally I do moisten the floor of the cellar and packing materials around other shrubs that are also stored there. This is to keep a high humidity level in the entire cellar.

The results with the cuttings were good; they were better than winter-cut materials. Some we kept 3 months and longer and they still turned out very well. We did this for several years with cuttings, but were still trying to gather "fresh cut scions" for juniper grafts as the good book said. Then in the winter of 1968-'69 we went out to gather scions in late December. There had been several storms just previously. We got down in the nursery with much effort and found just a little of the tops of the upright junipers sticking out of 4 feet of hard-crusted snow drifted solid between the rows. Three of us shoveled all afternoon to dig out rows and cut icy scions; we also broke up some tree tops. We spent several days trying to get a few thousand scions. I said enough of this, never again.

So the next fall in late November we also cut our juniper grafting scions, stored them in baskets and held them like our cuttings. We could not get as many in the baskets because of the larger size. They run about 350 to 500 scions per basket. We kept a good record of the grafts made from stored scions, and the results again were better than previously when they were winter-cut.

Last year some were held until March 6th. These were stored 3 months and 1 week and the graft results overall were over 90% on our 8000 juniper grafts. I have tried storing 18 varieties of junipers and can see no difference in any of them if they are free of blight and dry when put away. On making the cutting or graft, I do like to make a fresh cut and remove a small piece from the bottom.

I have also cut and stored scions of some pines and spruce varieties. These were not held as long a time but were used after about 4 weeks. The success ratio was as good as newly-cut materials.

In our northern climate we have found this to be a better way to

handle cuttings and scions than the "fresh cut" method and our results have proved it so.

I do not wish to say that these procedures are all totally original. I have seen one other nursery in our area store cutting materials. Also our good member, Jim Wells, as far back as 1955, in his book on propagation mentions the making of arborvitae cuttings, storing them in sphagnum moss for 6 weeks, then planting them when they were callused in March. However, these above two methods are different than the ones we use.

CASE HOOGENDOORN: Do you cover these baskets with poly?

DICK CROSS: No, I leave them open but, as I mentioned, there is a dirt floor in the cellar where I store them and though I do occasionally moisten the floor I am careful not to get any water on the cuttings. I tried wetting them one time, but I had trouble so I haven't done it again.

DICK AMMON: What experience have you had taking frozen scion wood?

DICK CROSS: My experiences have not been good. I prefer to collect the materials when temperatures are above 20° or 25° F.

JIM WELLS: When I was out at Dundee, we did quite a bit of storing cutting material and I had a room which was much as you described except that it was above ground and we never had one bit of trouble with material stored in it. It was kept at about 32° F and materials were held there for up to 2 months. I have also tried storing some materials in refrigerator at 33° F; in darkness they begin to deteriorate after about 2-2½ months.

CASE HOOGENDOORN: We have taken cuttings which are frozen, but we bring them in and dump them in a tub of water to thaw them out; it seems to work satisfactorily.

MODERATOR PINNEY: Thank you very much, Dick. Our next speaker is Richard Zimmerman of the U.S.D.A. We have had the privilege of hearing some of Dr. Zimmerman's cohorts at previous meetings, but today he is going to talk to us about shortening the juvenile phase in crabapple seedlings.