believe that rooting percentages have increased and a better rooted cutting has been produced.

PROPAGATION UNDER POLY FILM — NO MIST

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I had the pleasure of going to England, Belgium, and Holland on the 1980 IPPS tour. One of the most impressive things I saw was the way they propagated with poly lying on the cutitngs in the frames and benches. I asked why they had no mist, and the reply was, "What we do works."

Sealed or closed propagating structures are not new to IPPS members. The Nearing frame has been mentioned a number of times in the Proceedings. It was noted for use in rooting difficult-to-root material. It emphasized the use of cool north light and a good moisture reserve built in. The air space around the cutting was small and sealed. I felt that the conditions were similar to what the Dutch were doing. I made up my mind then that when I got home I would try their system. The simplicity of the idea seemed so appealing that I ordered a capillary mat and installed it on the floor of a heated house. The floor has porous concrete with hot water pipes below the surface, which produce good steady bottom heat. It was January when we made a crop of broad-leaved cuttings. We made an assortment of *Ilex crenata*, *I. cornuta* and others in flats and arranged them on the mat. They were watered well and then covered with a thin poly cover lying directly on the cuttings. Prior to sticking the cuttings they were treated with 0.25% IBA in alcohol. We used the quick-dip method, and bottom heat was adjusted to about 74°F.

I have never seen quicker or better roots form on these species. On most of the *Ilex crenata* cuttings roots were becoming well formed in two weeks. They continued to develop and even grew out the bottom of the flats. I became very enthusiastic and removed the plastic cover as soon as the roots had gotten a good start. A problem did develop at this point which turned up when checking the cuttings. I found some browning in the *I. crenata* 'Helleri' flats caused by a soft root rot identified as *Pythium*. A drench program using Subdue (metalaxyl-CIBA-GEIGY) seemed to do a good job in controlling this fungus. The disease had spread with an incline in the floor and the capillary mat apeared to be a good conveyer. The excellent roots on the 'Helleri' cuttings had grown out of the

flats and picked up the *Pythium*. The flats of rooted cuttings were removed to another house; when we transplanted the damaged cuttings that were not killed, we found new roots forming. I have not used a capillary mat since that time.

At Lancaster Farms we have never developed a consistent system for rooting junipers. We have only gotten into considerable production of them since the big freeze in 1977, but since then they have become a good part of our plant income.

I have had high hopes that the Dutch system might be the answer to our juniper propagation problems. I have tried them under a number of conditions. In a cool unheated house we had conventional mist on cuttings stuck directly in small pots. We covered some of these direct sticks with a film of poly. In the house with bottom heat we have tried mist, poly-covered flats, and even Dr. Whitcomb's cloth tent with water moving through the cloth but with no water reaching the cuttings.

Our results were varying. After we had finished transplanting our juniper crop the next spring, we felt that the best results came from the pots and flats that had been covered with poly film. All of these checks were done in the fall of 1981.

Dr. Tom Banko, with the Virginia Truck and Ornamental Research Station, has tested juniper propagation every month in the year, and he feels that September and October, April and May are the optimum times for rooting junipers. With this in mind and feeling some enthusiasm for poly-covered cuttings, we filled a house full of juniper cuttings this September. The house is unheated and covered with white poly and shade cloth. We were concerned with the heat in September. Apparently our fears were well-founded and the results were rapid. Soft rot formed on some of the stems and foliage. Some root primordia developed rather quickly, but the overall picture was very poor. Our medium was peat, perlite, and some fine pine bark. We felt that this held too much moisture, and we re-did most of the house with a new mix and new cuttings. We are hoping for better results from this new crop.

In early October we started a number of juniper cuttings in the house with the bottom heat. These flats were sealed with a thin clear poly film and covered with a tent of white poly to keep it cool on the surface of the cuttings. It is still too early to form an opinion on this group. We would like to try cuttings in March, but unfortunately this is a very busy time for us.

We will continue to try different media and different hormones and hope to develop a better sanitation program. In the future perhaps we can work on a good fungicide program on

stock plants as well as a good cutting drench for prevention of rots and molds. We will continue to try to perfect this system as we have seen enough good results to encourage us even though there are many problems yet to overcome.

MY EXPERIENCE WITH HIGH HUMIDITY PROPAGATION

BUTCH GADDY

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Colesville Nursery is a wholesaler container nursery located in Charles City, Virginia. Since 1975 we have produced about 100 different cultivars of woody ornamental landscape plants. Currently, 7 acres are in container production and 10 acres are in field production. When we first began nursery production 100% of our liners were purchased from other nurseries; today, we are propagating 95% of our own material.

Since commencing our operations, we have employed a wide variety of propagation techniques. Initially we experimented with small propagation tents, but those turned out to be inefficient. We next set up a greenhouse using intermittent mist. But we soon discovered that our water source — a nearby pond — contained trash particles that clogged up the mist nozzles even when a filter was used. We then tried brass spinners, but found that method unsatisfactory because of low water pressure and uneven soil saturation.

In 1980, on the advice of Dr. Daniel Milbocker of the Virginia Truck and Ornamentals Research Station in Virginia Beach, we began using the high humidity propagation system. Dr. Milbocker presented a paper on the high humidity propagation system to the Southern Region of the IPPS in Huntsville, Alabama (2).

We began using the system to maintain the highest possible humidity in our propagation houses during daylight hours at a temperature conducive to root initiation without saturating the soil around the cuttings. We use an Agritech high humidity unit which is built in Raleigh, North Carolina. The humidifier has 4 centrifugal nozzles that produce droplet sizes ranging from 10 to 50 microns with a water output of up to 50 gph. A fan mounted behind these revolving nozzles suspends the droplets in 4000 cubic feet of air per minute, traveling at 30 mph. This unit is suspended by an oscillator that directs the air flow horizontally in an adjustable arc of approximately 90° (2). This unit is designed to humidify 1000 ft^2, but we have found through experimentation that 600 to 800 ft^2 is more realistic in our long and narrow greenhouses.