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## **FIELD PROPAGATION TECHNIQUES FOR CONIFEROUS EVERGREENS**

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At Bush Ranch we produce about 5 million bare-root coniferous evergreen liners per year. We have several unique practices in our production system. I will discuss three of them this morning but first I will explain how we prepare our field beds for propagation.

Everything is done outside in open beds, each holding approximately 100,000 liners. We start preparation by tilling the soil. We then take a soil sample, make the necessary adjustments with fertilizer and lime, apply a nematocide and a prophylactic dose of fungicide and, finally, fumigate the soil by injecting Brozone.<sup>1</sup> This is a form of methyl bromide, which we use because it is effective at low temperatures, and we do most of our fumigating during the cold season.

After soil preparation is completed, we install galvanized pipe mist lines. Eight 48-inch beds are irrigated by a single line, 4 beds on each side. Each of these 8-bed sections has a single time clock that controls both the mist and irrigation systems so that it is possible to irrigate, mist, or both at the same time.

As stated earlier, we follow three unusual practices that I believe will be of interest to you. The first of these is our practice of sticking these coniferous evergreen liners in the summer, in contrast to the usual recommendations. One reason for doing this is to help balance our labor requirements throughout the year, since most of our harvesting and shipping is done during fall and winter. We are able to achieve reasonable success by rooting at this season. However, I do not feel I can recommend widespread use of this practice. Watering is extremely critical; a small error can result in a tremendous loss. In most cases there is no real advantage to summer sticking; however, it can be done, and I encourage you to experiment with this idea.

Our second unique practice is sticking cuttings right in the field. Nothing special has been done to the soil except for the fumigation and fungicide treatments. As you well realize there

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<sup>1</sup> Brozone: Dow Chemical Company

are still pathogens present and, unless you as a propagator can learn to manage them, you will find direct sticking in the soil is a disadvantage.

We maintain only a small number of stock plants as we prefer to cut from young growth. We have found it works well to take cuttings from the liners that will be dug the coming fall and winter. The plants we do have in our stock block are also young and are replaced frequently.

I do recommend the third practice we follow that is different from usual methods. We do not strip our cuttings. If we had to strip our wood, it would reduce our production by 2 million plants a year. This is our main reason for not stripping. The second reason is that we did not read the book; we started by simply taking the cuttings and sticking them in the ground. They rooted quite well. We accidentally found that this method had other advantages besides speed. Our biggest propagation problem is basal rot at the bottom of the stem. The primary reason for this is inserting the cuttings too deep. We want to keep the cuttings as shallow as possible, near the surface of the soil where there is more oxygen. We try to stress the importance of shallow planting to our employees. However, if we are propagating woody material with a bare stem or if we strip the evergreens, we find the tendency is to put them 2 or 3 inches deep. Leaving these lower branches helps control this depth problem.

Still another advantage is that soil fills in around these lower branches and helps support the cuttings once they are inserted. This stabilizes the cutting until it roots.

The fourth reason we have for not stripping cuttings is that this reduces the legginess of the plant since the liners have branchlets down to the soil line at the time of digging. By that time the cutting will have shed most of the branches below the soil line so the plant has done the stripping for us.

We find no advantages to stripping coniferous evergreen cuttings. We propagate a great many *Thuja*, and I might comment on our manner of placing these cuttings in the beds. There seems to be an advantage in orienting the fans of branchlets in a north-south position. We have no definite explanation as to why this practice is beneficial but feel it may be because they are better exposed to east-west sun. It may also be because there is better aeration when we align the cuttings so that they do not touch.

Harvesting techniques are important. We have 2 machines that dig under the beds. One of these oscillates, digging somewhat deeper than the standard undercut, which makes it better for larger material. Most of our plants, however, are harvested by running the standard machine under the beds several times.

We are then able to lift the cuttings easily and retain most of the root system.

We try to retain as many roots as possible, but it is just as important to see that these roots never dry out. We believe this to be the key to success. We carry wet, not just moist, burlap to the field and use it to cover cuttings as soon as they are dug. They are kept wet until they are returned to the packing shed. There the liners are graded, tied in bundles of 26, packed in moist sphagnum, wrapped in plastic, and put in wire-bound boxes for shipment. We then place them in a cold storage room until shipped. We think it is beneficial to hold the liners in storage for about a week before shipping.

Workers sit directly on the ground to stick cuttings, working down first on side of the bed and then the other. We have designed a board, which serves as a dibble and can be used to open one row and close the previous one at the same time.

We pay on a piece rate basis, and any one of our employees can cut and stick 1500 cuttings an hour. We pay for a plant when it is actually in the soil. These workers are able to make much more than minimum wage. However, it takes 4 or 5 years for an individual to develop this skill. We have probably screened 100 planters to find 8 who can produce satisfactory liners at this speed.

CHARLIE PARKERSON: Do you use a rooting hormone?

BILL LAWSON: We have and we find an increase in rooting of about 20 percent. However, the worker in the next bed was able to stick twice as many cuttings in the same length of time. From an economic standpoint it is better for us to increase the number of cuttings stuck than to use a hormone, even though we do not get quite as good percentage rooting on some items.

VIRGINIA LASSITER: What kind of spinner do you use in the field?

BILL LAWSON: We use normal Rainbird spinners for irrigation. For misting we use a brass oil burner type nozzle. We make our own screens for these. It readily disassembles and cleans. It has a low rate, and our cycle is very coarse in contrast to that used in most propagation units. In July our cycle would be approximately 5 minutes on, 10 minutes off.