

soilless medium. Methods of application are surface, dibble, and incorporation.

The question is asked, "Is the dibble application method for me?" Our suggestion to growers is to set dibble trials with their crops to determine safety, cultural, and economic benefits. A dibbling decision can then be made.

LITERATURE CITED

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USE OF DRIP IRRIGATION IN SEEDLING PRODUCTION AND IN TRANSPLANTING ROOTED CUTTINGS

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I speak with only two full years of experience in using drip irrigation in the field. Even with this short experience I am sold on it to the extent that we are expanding its use as fast as our finances and water supplies will permit.

Before we could undertake drip irrigation we had to develop a water supply which we did by digging wells. In the mountains of Tennessee you're lucky to hit any water in a well, much less enough for irrigation, but we were fortunate to end up with a total of approximately a 200 gpm supply from 5 wells. These wells pump into a common underground system of 4-inch lines totaling about 25,000 ft in length, making water available to a 200 acre area. With this limited amount of water the use of drip irrigation made good sense because of this method's efficient water use.

PROCEDURES

I will briefly describe five applications of drip irrigation with the pipe on top of the ground.

Five places in our production scheme where we are using drip lines are:

- 1) Dogwood seed planted in the fall in open fields.
- 2) Rooted cuttings from the greenhouse planted in the field in June and July.
- 3) Bench grafts potted in the greenhouse in January and moved to the field in June and July.
- 4) Hemlock seedlings spring-planted into the open field.
- 5) Trees spaced out for larger caliper size balled and bur-laped production.

1) We plant our dogwood seed in November or December and cover them with sawdust. Ideally, the drip lines should go right on them but sometimes we wait and have to do it during the spring rush. Short stakes or grow-straight hold the drip line where we want it. The drip moisture next spring brings the seed up. We water them all summer and as we bud. The line stays there all winter and is used to grow out the dogwoods next year as 1-year buds.

2) In May we take softwood cuttings of *Prunus*, including Japanese cherry and purple-leaf plum. They are rooted in compartmented trays in the greenhouse under a traveling boom mister. For the past two years these rooted cuttings have been taken to the field in July in 100°F heat, drip lines put on them just as soon as they are planted and left until September. The cuttings then go dormant naturally. The next growing season we grow them on without drip because it is not really needed. However, it would no doubt have helped make larger sizes. We believe we should be getting rooted cuttings into the field a little earlier and hope we can by sharpening up our rooting operation.

3) This past winter we made whip-and-tongue bench grafts of pear, wisteria, zelkova, and flowering locust. We immediately potted them into milk cartons and put in our fog house. With no heat, and humidity at about 75% we got excellent results. They were 12- to 18-in tall by May 15. They should have gone to the field then and placed under drip, but we did not get them out until the 1st week in July. We have better than 90% livability in the field right now.

4) Canadian hemlock seedlings are hard to get started in the open field in our country because of summer heat. In July, 1983, a block of excellent quality seedlings planted in April

were dying fast by midsummer. We put drip lines on the balance and saved them. We replanted the skips that fall and kept the drip on them this past summer with excellent results. We are now of the opinion we can go to the open field with 2-yr conifer seedlings under drip and keep the soil temperature more favorable for growth and successful establishment in the field.

5) Emitters spaced 40-in apart were placed on trees transplanted to 4-ft spacing in the row for growing balled and burlaped material to larger size.

EQUIPMENT

The equipment we are using came from Shemin Nursery Irrigation Department in Atlanta. They have an engineering department that will size and lay out any kind of system to suit your needs. The make of the system is Agrifilm, which originated in Israel.

We are using 3 different spacings of emitters, 18-, 24-, and 40-inch. The closer spacings are used on seedlings and grafts. The 40-inch spacing is used on trees spaced wide apart in the row for ball and burlap production. An interesting sidenote here is the fact that we ran 9,000 ft of line with 40-in spaced emitters through a ¾-in garden hose on a temporary basis. Although we probably cut down the rate/hour, we still got good uniformity of coverage.

This coming year we plan to fertilize through the driplines and apply Subdue fungicide on dogwoods.

SOME DO'S AND DON'TS

DO always use filters and clean them regularly.

DO always use pressure regulators.

DO always walk the lines everytime you turn the water on. Plugged emitters, separated lines, and lines out of rows cut down on efficiency.

DO take the line up carefully. Keep mud and dirt out of them and flush thoroughly before reuse.

DO check the far end of the lines regularly while the water is on so you can correct problems. And you will have some.

DON'T peg down the far end of the drip line. Overnight contraction will separate the line.

DON'T make your individual lines too long. We think about 500 ft is the maximum. If your block has long rows, consider supplying from the middle in each direction.

DON'T try to force the water up hill. You won't get uniform coverage. If a slope is present, let the water run down hill.

DON'T try to hoe weeds and grass over a drip line. You'll cut it all to pieces.

DON'T let the line crawl out of the row. Through expansion and contraction the line will get off the row unless kept in place by stakes or soil on the line. The effectiveness of the water application is cut down if the line is not kept in place.

PROPAGATION OF BAMBOO BY VEGETATIVE MEANS

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Of the hundreds of bamboo species grown in the United States only two are native; most were introduced from Asia. Most bamboo grown by commercial nurseries is used for ornamental purposes; however, the uses seem only limited by man's ingenuity and imagination. At our nursery, located at Jefferson Island, Louisiana, we produce container-grown bamboo of both *clump* and *running* species. Specific problems or limitations exist in propagating these plants.

First we will separate and define the two classes of bamboo currently being propagated on a commercial scale.

Clump-forming bamboo typically produce late summer and autumnal growth, each successive cane developing adjacent to the preceding one. They are generally tropical or subtropical and grow constantly if moisture and temperature are right.

Running bamboo produce sprouts very early in the spring followed by underground development until late fall. Generally this type is from temperate climates. By understanding these simplified characteristics, it becomes apparent that many techniques used for one group will be unsuccessful if used on the other without modification.

Since some bamboo do not flower freely or only rarely, seeds cannot be depended on for propagation. Some species flower only once a century. In addition, most species currently in clonal production are maintained for characteristics favored for particular purposes.

Murashige at Riverside, California reports success with