4. Last but extremely important, be realistic about profitability. Are we looking for that "pie in the sky", or is tissue culture profitable? Is it only a status symbol? I ask, "Is tissue culture profitable?" and I can answer, "Yes, but when?"

QUESTIONS FOLLOWING TISSUE CULTURE FORUM

CHARLES PARKERSON: Question for Raymond Oglesby. Why did you decide to get into tissue culture? Was it to grow a particular type of plant you could not obtain any other way?

RAYMOND OGLESBY: I became very interested after taking the short course that is offered at Lake Placid. Information can be obtained from the W. Alton Jones Cell Science Center, Old Barn Road, Lake Placid, New York, 12946. There is a great demand for *Hemerocallis* cv Aztec Gold for landscaping in our area. We found that we could produce 15,000 daylilies on 20 square feet in 30 weeks. We sold the 15,000 'Aztec Gold' for $1.50 each. This inspired us to do more. I would definitely recommend taking the short course to anyone interested in tissue culture.

PROPAGATION OF LILACS

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Cultivars: At Ozark Nurseries we propagate the following lilac cultivars: *Syringa vulgaris*, produced from seed on raised beds, *Syringa rothomagensis* (Chinese lilac), *Syringa vulgaris* 'Charles Jolly', *Syringa vulgaris* 'President Grevy', *Syringa vulgaris* 'Mme. A. Buckner', *Syringa vulgaris* 'Mme. Lemoine'.

The average combined number of cuttings stuck each year is 240,000. Of this number, 160,000 are French lilacs.

Cutting beds: Our cutting beds are 60 feet by 40 inches mini-Quonset structures. Retaining walls are constructed of 2 by 6 inch lumber. A 2 by 4 inch board is used to frame the beds. In our older beds a clay drain tile is run down the center of each, and in our newer beds French drains are used. A French drain is a ditch filled with gravel and is not too satisfactory. We use a medium of native soil (light clay loam) with peat moss added each year to increase the organic matter. The amount of peat added varies with each individual bed. Osmocote 18-6-12 is then added at the rate of 15 pounds per bed and cultivated into the soil to a depth of six inches.

Methyl bromide is used to sterilize the beds, applied at a

rate of 7½ lbs per bed 60 feet by 40 inches. This is primarily for weed control.

Covering: Six by six inch concrete reinforcing wire cut to correct size and bent in a half-circle is placed on the beds. The beds are then covered with 4 ml clear plastic 8 feet wide. The plastic comes from a roll with one fold. This is important because the folds are the first places to degrade. It would be possible to use a plastic with an ultraviolet light inhibitor to delay the degrading process, but the plastic is only required, at most, to last 8 to 10 weeks.

Cuttings: Cuttings are obtained from plants in the field and from a recently established "stock block." Timing is most critical as cuttings taken too late have a much lower rooting percentage. In our case it is not possible to supply even minimum heat to our cutting beds. Therefore, it is advisable to wait until after frost danger has past, even if the cutting material is of correct size earlier. Cuttings taken later in the year do not grow off well due to Oklahoma's extreme summer temperatures. The best size cuttings are 5 to 6 inches long. Smaller cuttings we found will root, but do not fit into our production system easily, due to the fact that they are harder to handle. Cuttings are cut and counted into bundles of 26, and the bottom third stripped of leaves. They are stored in ice chests until brought to the propagation area.

Once brought to the propagation area the cuttings are placed on a "crisper," which is an open wire bench with a time clock controlled mist line over it. Here they wait no longer than 24 hours to be stuck.

Cuttings are first dipped in a solution of captan, 1 tablespoon per gallon of water. Next they are given a 5 second quick dip in a solution of ¼ per cent IBA.

Approximately 12,000 cuttings are stuck per "mini-Quonset," which gives a spacing of 1½ inches between cuttings in the row and about 2 inches between rows. Two girls can stick approximately 20,000 to 25,000 per day.

Mist is supplied to the cuttings through Eddie mist nozzles controlled by 12 minute time clocks, giving a minimum of 12 seconds of mist every 12 minutes. I feel a shorter mist interval would be more satisfactory.

The mist is controlled manually, hour to hour, day to day with 24 hour clocks controlling the 12 minute clocks. The rule of thumb I follow is to use the least amount of mist that still keeps the cuttings turgid.

Once the cuttings are stuck, a weekly spray program is initiated, using captan, zineb, and Benlate in rotation. Banrot to

combat soil borne diseases is used when needed to control localized problems.

Rooting: Callus formation can be expected after 2 to 3 weeks. This is a critical time in controlling the mist as too much will result in a large buildup of callus and little or reduced root development.

Once 60 to 70% of the cuttings have developed the beginnings of a root system, the first stages of hardening off begin. (1) The top is cut out of the bed and pinned back. (2) Three days later the east side is let down. (3) Three days later the west side is let down. (4) The mist is reduced in stages as soon as the plants will tolerate a reduction. (5) Shade is removed only after mist has been off at least three days.

Care After Rooting. The plants are sheared using a household hedge trimmer. This helps to increase stem caliper and also prevents some of the slower developing plants from being shaded out in the early stages.

The main disease problem we have found with lilacs is powdery mildew. To prevent and control this, plants are sprayed every three weeks with captan and Benlate, depending on the seriousness of the problem. The beds are hand-weeded, and surrounding areas are treated with paraquat. We are hand watering the cuttings once they are rooted. The main advantage is that there is less weed growth in the aisles. However, the cost of watering is becoming prohibitive.

Osmocote in the beds usually takes care of the plants' nutrition. However, top dressing with ammonium nitrate is occasionally needed. We apply at a rate of 400 pounds per acre or 2½ pounds per bed. We irrigate immediately after application.

Percentage Liners Produced. We have found we can expect the following rooting percentages for the different cultivars: (1) *Syringa rothomagensis* — 80 to 90 per cent successful with 90 per cent of these number 1 liners. (2) French lilacs, with the exception of Lemoine — 65 to 70 per cent success achieved, 90 per cent of these are number 1 liners. (3) With MME Lemoine we have only been able to achieve 35 to 40 percent success, even in the best years. Ninety-five per cent of these are number 1 liners, however, since the lower percentage of rooting prevents crowding and shading.

Future Developments. Our main limiting production factor is lack of early cuttings. To help overcome this we stuck some cuttings this year in late August. They rooted satisfactorily in the cooler late summer weather. But only time will tell how many number 1 liners they produce and how they overwinter.