tion to control the urge to overproduce. The familiar cycle of overproduction and shortages that plagues our industry results in destabilizing market fluctuations of availability and price. Nothing can be as frustrating to a customer as discovering the cultivar that was in such good supply last year is scarce and over-priced this year (or vice-versa). This problem can be solved with proper planning and effective product management programs in our own businesses.

I would like to introduce our panel and ask each of them to share their concerns and ideas on plant introductions. Each of them has a strong commitment to a different aspect of the nursery industry. Each as been involved with selecting, introducing, and selling new cultivars.

MAINTAINING CREDIBILITY IN PLANT INTRODUCTIONS II

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For the past 20 years our small nursery, which grows woody ornamental plants for the wholesale market, has been deeply involved in a continual process of building and maintaining a product line consisting primarily of relatively hard-to-find plants. Our selection criteria gives heavy emphasis to dwarf and slow growing plants. The majority of our ornamental plants are not "new" selections, just known but neglected plants.

The very nature of the selection process that we followed up to the advent of micropropagation provided a pace and built-in discipline, which helps assure a fair amount of test and evaluation time in the climates into which we market our plants. The typical starting point would be a single, small plant or a half dozen cuttings, a couple of progeny of which would go into the garden or stock area for observation. If, over the next few years, we liked what we saw, we would run a couple of dozen plants through our production system to see how they performed. By the time we moved to a trial crop of 100 to 200 plants, there has been a lot of time to communicate with others who have had experience with this plant, to evaluate its ornamental qualities in our climate, to test garden culture, to test its adaptability to the nursery production process, and even to test market through friends and customers and a few customers of our customers.

This procedure, with its very moderate pace, contrasts quite sharply with what we are beginning to witness in these early years of woody plant propagation by tissue culture. There is something

about the excitement and romance of a new area of knowledge which causes an otherwise quite learned, experienced, and stable person to forget hard-learned rules and trip over their feet in their haste to get on with it. In our haste we create more problems than we solve. If that is the case, we fail to progress and, in fact, may unnecessarily go backwards. We need seriously to adjust our attitudes and the procedures that we are currently developing in tissue culture propagation. If today's session achieves only one thing, the stimulation of our thinking to the point where we moderate the excessive swing of the pendulum under its own momentum, our time here will have been well spent.

For those who may not think that we have a significant problem, a review of a few simple facts should suffice.

Nomenclature is perhaps the sector of most damage to date. Because of the ease of making serious errors with the large numbers being widely and rapidly disseminated, we have a real monster by the tail. Mistakes in these early years of tissue culture will not be erased in the next decade even with conscientious effort. I suggest that the first 5 years of woody plant tissue culture may have created more misnamed plants than the total of such mistakes in the entire post World War II era. At one time in our nursery we had, just by chance, six evergreen rhododendrons propagated by tissue culture sitting side-by-side. It turned out that one-half, three of the six, carried completely erroneous names. The record with the deciduous rhododendron hybrids was not much better. Many growers who purchased these plants do not know to this day that the name is wrong. There are probably one or more who will continue to distribute these plants under an incorrect name for the rest of their days.

One of the great potential advantages of tissue culture is an improvement in the quality of the individual plants. This is especially pronounced with rhododendron where elimination of that open, leggy, young rooted cutting is really exciting. Here too, the new problems created from too much haste may well offset the hoped-for advantages. We have in our nursery a crop of tissue-cultured *Rhododendron* 'Molly Fordham', with every other plant containing witch's broom type growth with no normal foliage. A couple of month's back, I brought back from a visit to a neighboring nursery, three plants with very distinctly different leaves and rates of growth all selected from a large batch of tissue-cultured *Rhododendron* 'P.J.M.' Had I taken more time to make careful comparisons, I probably could easily have doubled the number of variants. We have a couple of beautiful crops of a dwarf rhododendron from tissue culture which give every indication of not having a gene to tell them to produce flowers. These plants, with which we have long been familiar, have grown too long to attribute the lack of flower buds to juvenility.

In the case of *Kalmia latifolia,* we see a big difference in consistency of quality between seedlings and the many nice tissue-cultured clones. Many of the latter have a high percentage, like ⅓ to ⅔, of discards because of inadequate root systems. These can be kept looking fairly good in the wet regime of a container nursery but they will not establish in the garden. There has been a great difference in response from clone to clone. A growing medium for protected indoor conditions which has resulted in excellent crops of seedlings year after year will grow beautiful *Kalmia latifolia* 'Carol' from tissue culture plants but will cause serious leaf damage and drop after every flush of *K. latifolia* cultivars, Sarah and Nancy. Incidentally, we have at least two distinctly different plant types in the remains of our 'Sarah' crops. We have a lot to learn about the basic procedures but, under the current system, the people who are learning what is wrong are not the ones who can undertake correction.

We badly need to adopt different attitudes at every level of our procedures. The plant breeder or finder is acting just like before micropropagation; casually passing along pieces of propagation wood of a new plant of current interest without thinking much about the real consequences when it goes to a tissue culture lab. The plant originator must somehow continue to obtain the help of others in testing and evaluation but without the risk of premature propagation in large quantity. This person must also take extra care to make certain that a good clear label goes out with every piece of wood. Not only are time and quantity to be considered but, with tissue culture, we will typically have involved people without wide knowledge of the plants being multiplied.

The manager or decision maker at the tissue culture laboratory has been assuming that, if he is given a piece of wood, it is O.K. to propagate real numbers without further authority. Most times it is also assumed that this plant has already been tested and passed on by that very knowledgeable and experienced plant breeder (or he would not have been given the wood). It has also been assumed that, if a plantlet develops from the lab's effort, it is a healthy duplicate of the parent.

The tissue culture lab has to exercise a greater sensitivity to the importance of several of its logical responsibilities:

1) as to the status of the potential product.

2) as to the weaknesses inherent in such a new, still being tested, process. There is a need to understand exactly what is being produced and sold before it is shipped out.

3) as to assuring proper names.

In addition, the lab should assume some responsibility for judging the ultimate demand for a given plant and the correspondingly appropriate production. A national market is being served and

no one else knows just how many plants are being produced.

Lastly, the grower or buyer assumes the purchase of a good, well-selected and well-tested plant, or it wouldn't be offered for sale. Each of the different levels of the system seems to be falling into the trap of shifting the final responsibility for this evaluation function to another level. The grower needs to be more thoughtful in this matter. Also there is a need to apply more common sense in trying out new items. The process makes it a bit too easy to move faster than one should. The glamour of the new items and the low cost of an initial start tends to undercut those parts of the process which normally would provide resistance to buying in more than a grower.

The old system sort of took care of many of these potential problems over the more considerable span of time involved. We will benefit greatly from the advantages of tissue culture if we all apply our very best efforts to correcting these basic flaws. I believe that this can be done simply by taking the time to put to work what we already know.

MAINTAINING CREDIBILITY IN PLANT INTRODUCTIONS III

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First, let me give you a little background. I was trained as a botanist, worked for 25 years at the Connecticut Agricultural Experiment Station as a plant breeder and horticulturist, and since 1984 have been a self-employed nurseryman and Christmas tree grower. I have selected and bred mountain laurel (*Kalmia*) for 27 years and am responsible for naming about half of its new cultivars. I also serve as the International Registrar for the genus. So, if you are naming and releasing a new mountain laurel, let me know.

I am delighted to serve on this panel because I find I have somewhat ambiguous thoughts on naming and releasing new plants. On an intellectual level I am conservative and would argue for thorough testing before release. However, in the real world I am more pragmatic and, quite frankly, have been willing to release material without acquiring some of the information it would be nice to have.

The criteria for selecting and naming a new cultivar is going to vary somewhat depending on the genus, the number of cultivars