

2) Through micropropagation immediate demand can be satisfied without a long delay. After 5 to 10 years of additional testing it may be difficult to rekindle that same demand.

3) The marketplace is the ultimate and final testing ground. The winners and losers will actually be sorted out more quickly in the marketplace resulting in better cultivars sooner.

4) Plants held too tightly and too long by an individual or institution may die with that individual or disappear with termination of a program.

Of course, none of this relieves us from the responsibility of being very honest in our claims for the virtues of new selections. It's a little like during your dating years with a new girl friend or boy friend, they may look good but it takes a lot of time and experience to determine their real worth. So it is with plants, we need to be very selective in naming and introducing new plants, but not so cautious that we are afraid of a few failures.

Let me try to summarize my thoughts on the release of new plants. Be as convinced as you can that the selection is better than anything else in the marketplace. Do not rely on one year's observations. Tout its merits when released but do not make unwarranted claims.

And for those of us purchasing and growing new releases, it behooves us to not commit too heavily until we are quite certain that the plants will perform up to expectations.

## **MAINTAINING CREDIBILITY IN PLANT INTRODUCTIONS IV**

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In considering the introduction of a new plant to the nursery trade, the first qualification must be that the new plant is recognizably different from existing clones or cultivars and genuinely superior to them. There is really no point in introducing a new plant which duplicates ones already established in the horticultural world. If, for example, I were to find yet another witches' broom on Norway spruce (*Picea abies*) I would not consider growing it and offering it for sale because there are already over 60 clones which were described and grown in the past, a large number of which are identical from a horticultural point of view, and the chances of coming up with a really superior clone are remote.

A corollary of this principle is to avoid too many new clones of a given species or group of hybrids. Plant breeders are like the proud

parents of many children. Far too often each new creation has special merit and distinction (no matter how small) and the result is a needless and detrimental proliferation of new clones. A clear example of the hazards of introducing too many clones is the family of Glenn Dale azaleas, which were hybridized and introduced by B. Y. Morrison from 1947 to 1952 while he was the Director of the United States National Arboretum in Washington, D.C. In total 442 clones were named and introduced, as one humorist stated—using up wastefully all the possible azalea names in the English language! With such an over-kill of new clones, they were essentially ignored by the professional azalea growers and have passed into oblivion. In contrast, the Delaware Valley Nurseries introduced only one highly superior cultivar, Delaware Valley White, which is now the standard in the trade, by which all other white garden azaleas must be judged.

An additional fact which must be recognized is that there is no ideal cultivar which is the best throughout the entire country. The United States is an enormous continent with a range of climatic zones from Zone 10, where it never freezes, to Zone 2 where winter temperatures of  $-35$  to  $-50^{\circ}\text{F}$  are commonplace. Temperature is only part of the story, however, because there are extremes of humidity and rainfall from the humid East and the rain forests of coastal Washington state to true deserts where rainfall is extremely rare. Soil pH also varies from the extreme acidity of bogs and conifer forests to the highly alkaline soils of the mid-western states. For example, *Acer rubrum* grows wild from Canada (Ontario and the northern tip of Nova Scotia) to the Florida Everglades. The cultivar October Glory is not reliably hardy in northern Minnesota, and 'Northland' is inferior to ordinary red maple seedlings in New Jersey. Similarly the hybrid crab apple 'Radiant' is a superb red cultivar in the low humidity areas of the Midwest, but defoliates in humid summers on the East Coast. Consequently there is a need for the best clones for a variety of climatic and soil zones.

An essential part of any program of plant breeding and introduction is testing the new clones before they are commercially introduced. A new plant should be tested for its performance in the landscape and on city streets if it is a shade tree. Prior to such testing it should be grown in the nursery for many years and evaluated for insect and disease resistance, growth habit, winter hardiness, and reasonable ease of propagation, as well as other criteria. A new shade tree obviously cannot be tested for its potential 50 to 100 years of life expectancy or none would ever be introduced. Our new trees at Princeton are routinely grown and tested for decades before they are finally introduced, and this makes tree breeding a very slow process indeed. We find that there are a few municipalities which are willing to test new trees under actual street conditions and we value their input enormously. We are less enthusiastic about tree

evaluation in arboreta and botanical gardens after some unhappy experiences in which our new trees were planted between and under two or more mature trees of that genus and then received unfavorable reports as being "weak growers".

A country as big and varied as the U.S.A. cannot have a nationwide evaluation program like the Royal Horticultural Society trials in England, because so often it would be a contest between "apples and bananas". Our best route is to institute regional evaluation programs like The Styer Awards of the Pennsylvania Horticultural Society which judges new plants for their garden merit under East Coast conditions. The program has already generated considerable prestige in our area.

In conclusion, maintaining credibility in plant introduction depends ultimately upon the integrity of the introducer who should be a severe critic of his own creations and introduce only a few of the very best of his new clones.

RUTH KVAALLEN: I would just like to make a plea for any person who is going to introduce a new cultivar to first contact the registration authority and get the name registered. This is important because it is impossible for registration authorities to go through nursery catalogs and hunt up new cultivars. Registration will allow you to determine if the name has been previously used and also prevent anyone else from using that name. If you do not know who the registration authority is, the American Association of Nurserymen can tell you.

NINA BASSUK: I have a few comments. I applaud the increase in diversity of our plant materials. In our work we are interested in looking at plants for urban areas and are developing protocols to actually rate plants for differences in environmental tolerances. I would like to see new introductions rated for urban adaptations.

DEB McCOWN: I have a comment. Many tissue culture labs have attempted to micropropagate plants that are difficult to propagate by conventional methods so that we can put them out for evaluation and obtain more information. I would cite *Kalmia* as an example.

BILL FLEMER: I have a comment on recommended plants not being available. We have a system in New Jersey that has worked quite well. Shade tree commissions have arranged ahead of time with a wholesale grower to contract-grow certain plants for their uses. This has worked well for certain clones or unusual species of plants. A nursery has to have a reasonable number of trees contracted for to make it worthwhile.

GARRY KOLLER: One problem I have always had with evaluations is, what you look for in a plant. This is a problem because we all have different wants and needs. I am afraid that what

we are looking for in many new introductions are minute differences rather than substantial market niches that will sell plants. Many of the differences we look for are not marked enough to be worthy of introductions.

### **Thursday Afternoon, December 10, 1987**

The afternoon session was convened at 1:30 p.m. with Chris Graham serving as moderator.

#### **RED OAK WHIP PRODUCTION IN CONTAINERS**

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**Abstract.** A system is described whereby the equivalent of 1-year-old red oak whips can be produced in 7 months, starting from seed.

#### **INTRODUCTION**

Currently red oak whips are produced as follows: In the first year, seeds are sown in fall or spring. The resulting 1- or 2-year-old seedlings are dug from seed beds and lined out in field rows. If the liners produce more than 18 in. of new growth the first season, they are cut back to 2 in. in height the next spring. If growth following lining out is poor, the cutting back is delayed one year. After cutting back the most vigorous young shoot is selected and trained vertically, resulting in 5 to 8 ft whips by the end of the growing season. Hence, the present whip production system requires 3 to 5 years to produce a 1-year whip.