

Whittle, Tyler, "The Plant Hunters", Chilton Book Company, N. Y.,  
1970

MODERATOR LEISER. Thank you very much, David. We, in the Department of Environmental Horticulture at U. C. Davis, are quite excited about the possibilities of bringing in more germ plasm, more variation. But once a new plant is introduced, the problem is to evaluate it and determine whether it is worthwhile, then get it into the trade. Perhaps those of us in educational institutions look at things quite a bit differently than nurserymen. Since there is a combined need for both plant evaluation and getting the plants into the trade, and since it is largely the nurserymen who will have to get the plant into the trade, they will have to do the plugging, advertising, and so on. Our next speaker, Bruce Briggs, is currently president of the Western Region and is vice-president-elect to the International organization. He will discuss the evaluation of new plant materials from the nurseryman's standpoint. Bruce.

## EVALUATION OF NEW PLANTS

BRUCE A. BRIGGS

*Briggs Nursery*

*Olympia, Washington*

In man's continuing search for new plants, there is an increasing need for more selective evaluation. There is no special merit in "newness" alone. Sometimes, we rather need a "new" look and evaluation of an "old" plant. Our greater mobility today now allows us to evaluate first hand the plant materials of other areas, to bring some back to adapt from other climates, and sometimes to discover improved variations within the species and new cultivars. Improved cultural practices and laboratory facilities give us greater controls over our immediate environment, so that new plant introductions can now take a course and a direction. We can work more directly toward selecting, shaping and breeding the plants required to fill the predicted needs.

As plantsmen, propagators and nurserymen, I feel that we have a special obligation to evaluate the "growing" as well as the "aesthetic" aspects of these new plants. As a practicing nurseryman, I consider the basic concerns are: 1) that the plant is capable of being propagated and grown commercially, and 2) that the plant has good sales appeal and potential market demand.<sup>1</sup>

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<sup>1</sup>Ed. Note: Mr. Briggs showed a number of excellent colored slides of plant materials to illustrate these points.

## CAPABILITY OF BEING PROPAGATED AND GROWN COMMERCIALY

**Ease of propagation.** As propagators, many of us pride ourselves on our abilities to propagate difficult plants by various special and often tedious methods. Nevertheless, when we are working toward quantity propagation, we must consider ease of propagation as a factor. If the plant is to become a financial asset to a nursery, it must be reproduced in a reasonable length of time and with a standardized system which the employees are capable of carrying out.

There are a few plants which warrant difficult and special propagation techniques because of their very superior qualities and high demand. For instance, nurseries still propagate *Acer palmatum* 'Atropurpureum' and *Cotinus coggygria* in its red forms because the public is willing to pay the premium for these desirable items.

On the other hand, difficult to propagate cultivars may lose their high demand as other cultivars take their places. *Rhododendron* 'Britannia' and *R.* 'Goldsworth Yellow' once considered the best are now used less often (at least in our area) where other good reds and yellows are now readily available. Likewise, our nursery passed over a very fine form of *Chamaecyparis nootkatensis* 'Pendula' which we obtained some years ago from Holland. It proved too difficult to propagate commercially by cuttings, so we have gone on to more easily propagated strains which were found in this country.

I do not mean to infer that we should entirely discard a fine plant because of the difficulty in propagating it. A plant of real merit should be kept in a private collection or arboretum with the hope that some new technique may be developed which would make its propagation more feasible. It might also be sent on to another climate or growing condition to check possible propagation under these varying conditions.

**Hardiness** is a somewhat relative factor which must be considered. As the more tender plants always seem to be the most attractive, we are constantly tempted to grow plants just a little more tender than we should.

Breeding programs may eliminate too tender varieties by exposing young plants to cold temperatures in growth chambers, or may test hardiness by subjecting tissue samples to artificial cold in the laboratory (3).

Breeders might consider selecting seeds, cuttings or scions from areas in the northern latitudes and the higher elevations when possible, as these plants will maintain their built-in early period of dormancy, regardless of where they are later transplanted (6).

A cross breeding with native plants of an area will sometimes increase hardiness. Institutes such as the Saratoga Horticultural Foundation, Saratoga, California, are constantly working on

hybridizing and selecting improved and hardier strains of needed plants. Currently, the Willamette Valley Experiment Station, Aurora, Oregon, is working on a program of selecting superior strains of the native *Ceanothus prostratus* and *C. procumbens*.

**General vigor and disease resistance.** When we are evaluating plants, we should consider their general vigor and their resistance to damage from insects, pathogens, diseases, and chemicals used in general culture.

a. **Insects.** Damage from the same insect may vary considerably among different cultivars of the same genus. Work by Dr. Joseph L. Saunders on the effect of the obscure weevil (*Sciopithes obscurus*) on 20 varieties of rhododendrons commonly grown in the Washington and Oregon areas, showed a wide variation of leaf damage ranging from 0.8% defoliation on *Rhododendron* 'Ivery's Scarlet' to 32% on *Rhododendron macrophyllum* (4).

In areas where black aphids prove very destructive to *Picea pungens* 'Glauca', plantsmen may consider it more desirable to substitute a plant such as *Abies lasiocarpa* 'Arizonica Compacta' to create a similar blue effect.

b. **Diseases and pathogens.** It will truly be a breakthrough when and if we could find plants entirely free of all disease problems. In the meantime, we can at least be somewhat selective and avoid those with known serious problems.

For the last five years, the Western Washington Research and Experiment Station, Puyallap, Washington, has been carrying on research to select varieties of lilac which are resistant to *Pseudomonas syringae*, a lilac blight (2). This type of research is very important especially where there is no known cure or satisfactory control of the disease.

We can sometimes choose between two plants of similar character to avoid a known problem. In our area, *Juniperus sabina* 'Tamariscifolia' is sometimes bothered by *Phomopsis juniperovora*, the juniper twig blight, which causes unsightly brown areas to form. A satisfactory substitute might be *J. chinensis* 'Pfitzeriana' varieties which do not seem to be attacked by this blight. We can choose to use *Photinia* 'Fraseri' rather than *Photinia serrulata* because it is more resistant to mildew. We might consider forms of *Chamaecyparis obtusa* or *Thuja* in place of *Chamaecyparis lawsoniana* to avoid damage from *Phytophthora*.

c. **Chemicals and pollutants.** In this day of a generally wide use of herbicides and other agricultural chemicals, we find some plants which are susceptible to some damage from them. Of the perhaps, 400 varieties of rhododendrons which

we grow, we find that R. 'Mrs. A. T. DelaMare' is particularly subject to damage from Atrazine and Simazine. As these chemicals are a part of our normal nursery operation, we probably will gradually phase out this particular variety. The *Rhododendron X loderi* hybrid group of plants will defoliate within hours after their foliage has been sprayed with Ethion.

With the present interest in ecology and environment, we need to work two ways at the same time: 1) to develop plants which will require fewer chemicals in their culture, and 2) to make selections and develop new cultivars which will tolerate the polluted air in the industrial areas. Successfully established plantings in these areas can help to tip the scale and actually work toward air purification (1).

**Transportability** may become a limiting factor in a nurseryman's evaluation of some plants. He must be able to transport the finished product to the market in a saleable condition. The fact that *Calocedrus decurrens* and *Cornus nuttallii* are exceedingly hard to transplant limits their otherwise potentially wider usage. The brittle branches of *Rhododendron* 'Jan Dekens' limit its use for successful long distance shipping.

#### SALES APPEAL AND POTENTIAL DEMAND

Saleability is the final and, perhaps, the most important test a plant must pass for a nurseryman who wants to stay in business. There would seem to be little purpose in growing plants without a ready market.

While most plants are attractive when they are of good general vigor and health we need to strive for "extras" in better foliage, growth habit, and bloom.

**Better foliage** may mean an increase in size, color, sheen or indumentum. *Picea pungens* 'Hoopsi' cultivar increased the intense blue color of the foliage. The *Magnolia grandiflora* 'St. Mary' forms increased the color and amount of indumentum on the underside of the leaves.

**Better form and growth habit** is something for which nurserymen and propagators are constantly striving. Forms of *Chamaecyparis obtusa* which outshine their parents, such as *C. obtusa* 'Nana' C.o. 'Gracilis' and *C. o.* 'Kosteri', can be vegetatively propagated to preserve their unique characteristics. The small needled *Pinus mugo*, which used to be selected entirely from seedlings, can now be propagated by cuttings to preserve the compact quality (5). *Prunus laurocerasus* 'Zabeliana', *P. l.* 'Otto Luyken' and *P. l.* 'Mt. Vernon' are newer cultivars in demand for their more compact habit and greater foliage sheen. Fastigate, weeping and prostrate forms have been developed from native pines, so that they can be used in residential gardens and will complement newer architectural trends.

Irregular and unusual forms are in demand for landscape interest. Specimens such as *Sequoiadendron giganteum* 'Pendula', *Picea abies* 'Pendula' and *Cedrus atlantica* 'Glauca Pendula' require considerable age to become attractive. Used as singles in a landscape, they are in more limited demand, but grown to a mature age and shape, they do bring a premium.

**Flowers.** Improvement in the various aspects of flowering lead to a higher evaluation of the plant. Flowers may be increased in size: consider *Rhododendron* 'Crest' compared to its parent, *R. wardii*. Flowers may be improved when the color is heightened; compare *Kalmia latifolia* 'Dexter No. 5' to the native *Kalmia latifolia*, or *Daphne cneorum* 'Ruby Glow' to *Daphne cneorum*. Flowers may be improved by changing their form; we have had the double bloom of *Rhododendron* 'Fastuosum Flore Pleno' and now one of the hybridizers has a new double pink form. The blooming period of the plant may be lengthened, as *Rhododendron* 'Hardyzer Beauty' blooms longer and larger than either of its parents, *R. obtusum* 'Hinodegiri' and *R. racemosum*. The plant may be brought into bloom at an earlier age, such as *Magnolia grandiflora* 'St. Mary' over the straight *Magnolia grandiflora*. The amount of bloom may be increased, as in *Fuchsia magellanica* 'Papoos' and *F. m.* 'Santa Claus' over *F. m.* 'Riccartonii'. Plants may be developed to bloom in periods when the flowers are especially in demand, such as the fall bloom on *Hebe* 'Autumn Glory' or *Sedum* 'Sieboldii', or the winter bloom on *Hamamelis mollis*, or on *Jasminum nudiflorum*.

## CONCLUSIONS

So then, these are some of the qualities a commercial nurseryman looks for in evaluating plants. As the hybridizers, plant introduction centers, and arboretums bring new materials to our attention, we can work closely with them in evaluating these "growing" aspects. As the designers, ecologists, and consumers bring new demands to our attention, we can work with them in "creating" the plant materials best suited to their needs. All plantmen join together in their appreciation of a good healthy plant of fine physical properties planted in the proper location for full mature development.

More selective evaluation at the various stages on introduction, testing and growing will serve to raise the whole general level of the quality of available plant materials. We will, indeed, need to develop superior plants if we are to meet the ever more demanding requirements of our future environment and our future generations.

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MODERATOR LEISER. Thank you, Bruce, for a real nice presentation. Now I know why it is always nice to have a back-up job. If Bruce ever goes broke in the nursery business, he can always hire out as a photographer, or teach color photography. I really enjoyed those slides, Bruce. Bruce mentioned a topic that is a nice lead-in for our next speaker; this is the point of their breeding program having a goal — objectives — what you want to breed into a plant. Our next speaker is not a member of the Society and I have known him for a relatively short time. He came to the University of California at Davis this year for a short sabbatical leave; in that time we thoroughly enjoyed having him and appreciated the contributions he made to our Department. When we were looking for a person to have on the program to dig into some of the new ideas in plant breeding, I asked a geneticist in our department who the best person in the country would be to do this — not necessarily the oldest, nor the one in plant breeding the longest, but the person who had novel ideas for really moving ahead and breeding commercial plants. He said, “That is easy — that would be Ken Sink”. So without further ado, Dr. Kenneth Sink, from Michigan State University, formerly from Pennsylvania State University. Ken.

KENNETH SINK. I don't know if all those comments are true, but I will try to live up to them. The title of my talk is “Hybridizing New Plants”, and I am sure you realize, as well as I do, that it would be almost impossible for me to cover all the facets of plant breeding of woody ornamentals and annuals in 25 minutes. So I have chosen four areas to dwell on in particular, and will give you some of our ideas and concepts and a little bit of our research results that we think will be valuable in producing really unique and valuable new plants.