

PLANT SELECTION AND INTRODUCTION— SOME FACTS OF LIFE

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When people are asked what they expect from arboreta and botanical gardens they all agree on one thing—to see plants. Nurserymen are no different. They look to botanical gardens for new plants, plants from other regions, and unusual plants with unusual characteristics not found in the trade, because botanical gardens are associated with plant exploration, selection, and introduction.

Where do horticulturists get new plants? Fruit production is based on a small number of cultivars, developed over long periods of time, usually from a chance seedling or a sport. Only in the past 40 years have organized breeding programs begun to produce new and improved cultivars for commercial production, supplanting the better known and older types.

In contrast, vegetable, flower, and turfgrass cultivars have been developed through extensive breeding programs of institutions and commercial companies. Competition is keen, the market is large, and the financial return for success can be substantial. Introductions from the wild, although of interest to plant breeders, seldom find their way directly into the competitive arena of new cultivars, unlike the situation with fruit species.

In the nursery trade, most of the plants we see in catalogues have been grown for years; sometimes a superior form is found by a nurseryman and introduced as a new cultivar. But often, our landscape plants are chance strains, found by good horticultural observers, rather than the product of careful plant breeding or exploration. Of course, there are many exceptions as, for example, the famous 'Bradford' pear from China and the successful breeding programs of roses, rhododendrons, camellias, and hollies.

There are other differences between the development of landscape plants and other horticultural crops. In the case of fruits, vegetables, flowers, and turfgrass, plant explorers now look for genetic materials useful in breeding schemes. In the case of landscape plants, it is the plant itself as a new individual which is collected by the plant explorer and introduced directly to the trade. Another difference is quantity. Most horticultural industries are based on large numbers of a few cultivars. New vegetables and flowers are suggested, even imposed, by the commercial breeding organizations. In contrast, landscape horticulture utilizes hundreds, even thousands, of genera, species, cultivars, forms, and

clones. The industry does no direct selection; rather, it is the buying public, including landscape designers, which determines plants to be introduced and grown on.

Many groups and organizations have been involved actively in landscape plant selection and introduction. The U.S. federal government has introduction and quarantine stations throughout the country and federal agencies, including the U.S. National Arboretum in Washington, D.C. have introduced plants. Many botanical gardens and universities have had success. On the West Coast, the program of the University of British Columbia Botanical Garden at Vancouver, B.C. has received much deserved attention for its involvement of nurserymen and landscape architects in its selection program. Similarly, there are many other countries with trial gardens and introduction programs as, for example, at Boskoop in the Netherlands and at East Malling in England. Commercial nurserymen are always on the lookout for promising plants, and occasionally new strains become popular. More recently, some nursery firms have established formal programs of plant testing and introduction with great potential for the future as, for example, Schmidt and Sons in Oregon and the Weyerhaeuser Corporation in Washington State.

Today there is a resurgence of interest in plant exploration and introduction, due to a number of factors. First, China has been reopened to foreign visitors, and the lure of one of the great depositories of plant material and the memories of plant explorations of the last century have generated great interest. The Chinese have recognized their own natural resources and are working to identify, exhibit, and exploit their own flora.

Second, the environmental movement and concerns about ecology and food production has awakened concerns about the diversity of gene pools for future plants. The U.S. federal government and international agencies have developed sophisticated networks of species collection and preservation, of which the United States system of repositories for important germplasm is an example.

Third, the public has become aware of endangered species, both animal and plant, and the phrase has become a modern rallying cry for individuals and organizations. Finally, Americans are becoming more sophisticated horticulturists. There is increased attention to horticultural education, Master Gardeners, public plantings, edible landscapes, and the therapy of gardening.

All of this has encouraged interests in plants, particularly plants for landscape purposes. Plant explorations, both professional and amateur are the order of the day, so much so that public gardens have found that plant collecting treks can be an important source of funds. At the same time as this resurgence of interest in plant exploration and introduction has occurred, economic support

for universities and other agencies has been seriously eroded. Botanical gardens, never over-funded, have been hard hit by the economy. So when nurserymen look to these organizations for new plants, it must be done with a knowledge of the financial facts of life.

As an example, in Seattle, where the greatest diversity of plants can be grown in all of America, and boasting one of the country's most knowledgeable assemblage of horticulturists, there is not an adequate quarantine facility for imported plants despite great local interest in collecting trips and plants from other regions. Requirements for such a program include, first, an isolated location with room for facilities and surrounding space; land costs are high adjacent to most botanical gardens and other agencies which could support a quarantine station. Second, a greenhouse or screenhouse must be built. Third, skilled personnel must be hired—a curator, familiar with plant quarantine regulations, and a maintenance staff. Altogether, the cost of a simple quarantine station could easily reach \$100,000 plus land with an annual operating budget of \$75,000. At today's interest rates, an endowment of \$1,000,000 would be necessary to support the program.

Similarly, a plant introduction scheme is expensive. After the initial costs of land and buildings, there are annual costs of 3 or 4 staff members, and operating costs to support testing and selection perhaps in several locations, expenses of a selection panel, advertising and publicity, propagation, pest management, harvest, storage, and distribution. If such a scheme produces 50,000 plants per year, a premium just to cover operating costs could easily reach \$4 per plant, or require an endowment of \$3,000,000. Whereas the costs of developing new food crops, bedding plants, roses, rhododendrons, and other high-volume plants can be recovered from sales, most landscape plants are not used in such abundance; and there are thousands of landscape plants, both woody and herbaceous, from which the discriminating gardener can choose.

This points out some facts of life—any successful plant selection and introduction scheme must have organization and must have financial support. It is impossible in almost all cases to carry out such a scheme with most landscape plants based on sales of the plants alone. Of course, this assumes that all costs will be reasonably assigned. In practice, many organizations do not make direct charges for plant introduction but “borrow” from other operations—some greenhouse space from production, computer time from accounting, and some publicity from advertising. Botanical gardens are no exception and, in their eagerness to develop funding and support, sometimes charge less than what it really costs to do the work, sometimes committing resources without charging for them.

These facts of life are not meant to overwhelm, to discourage,

and certainly not to inhibit programs providing new plants. It is important, it is necessary, and for landscape horticulture, it is still essential especially when so few breeding programs are in progress. On the other hand, it is time for nurserymen as well as managers of botanical gardens and other agencies to recognize the potentially enormous costs involved. Without the institutional help that was available in the 1950s and 1960s, and with the requirements that many programs be self-supporting, we must look elsewhere for funds.

Federal and State budgets must continue to provide funds for conservation, breeding, evaluation, selection, and introduction of new plants including landscape plants. Individual donors and foundations must be solicited to provide endowments; the most attractive parts of introduction programs, i.e. endangered species, must be oversold to provide for the less attractive parts. The commercial industry, both large corporations and individuals in small businesses must realize that this essential part of horticulture must be supported, and at greatly increased levels. Agriculture, including the nursery industry, has benefited from public-supported research, teaching, and extension programs for more than a century. In the future, agriculture, including the nursery industry, will have to compete for public funds and must make up the short fall through industry support.

In return, those interested and skilled in plant introductions must work cooperatively. Plant exploration must represent many botanical gardens and agencies, and each must pay a share of the cost. Plant discoveries from explorations must be shared widely. Quarantine facilities must be developed regionally. Selection of plants must be organized and speeded up and improved; patents must be observed. The good programs of today must be made better and more efficient.

The introduction of landscape plants has been a mixture of well-planned exploration and introduction, breeding, and chance discovery by a diverse group of nurserymen, plant explorers, breeders, collectors, and skilled hobbyists. Botanical gardens and arboreta have an important role to play. Knowledge of the process, appreciation of the costs, cooperation, and financial support is absolutely essential.

RALPH SHUGERT: Question for McMillan-Browse about *Magnolia kobis*, could you discuss this in regard to seed germination?

PHILIP McMILLAN-BROWSE: I have germinated seeds of this very successfully. It gives a good quality seedling to use as a rootstock. You must not freeze the seed during stratification as it will kill the embryo.

RALPH SHUGERT: Question for Henry Lima. Did you get any of your lilacs to bloom during your tests?

HENRY LIMA: Our experiments were mainly to produce lilacs with buds, but yes, we did have blooms on some cultivars, especially those from tissue culture and in the second year. They can be forced through January and up to March. With cold storage they can be held and forced at any time.

VOICE: What did you use to control *Pseudomonas syringae*, and did you grow your plants in the greenhouse or outdoors?

HENRY LIMA: The lilacs were grown outdoors throughout the winter. For *Pseudomonas* control you can use a copper spray in the fall once the leaves have dropped, also Agrostrep on new growth, once a week, a 1 tbs. per gal. spray, for stopping the blight.

BRUCE MACDONALD: Has anyone here had experience in using Rockwool for propagation?

BRUCE BRIGGS: We tried Rockwool a good many years ago with poor results. The plants seemed to be very weak going into containers. Perhaps it was something we were not doing right.

CURTIS J. ALLEY MERIT AWARD—1986

Presented by Bruce Briggs at the Western Region 1986 Banquet

The 1986 recipient of this Award was born in Missouri, March 16, 1921. He grew up in Kansas and came to California in 1939 to attend a carpenter's apprenticeship program at California Polytechnic Institute, San Luis Obispo. A few months later he enrolled in the Horticulture program and several years later received a B.S. degree.

During World War II he served in the military as a flying staff sergeant. Then he returned to California Polytechnic Institute as a teaching assistant and became a permanent instructor in 1947. In 1954 he became Acting Department Head of Horticulture. At about that time he took a sabbatical leave to obtain an M.S. degree at Ohio State University. He took another sabbatical leave in 1963 to complete his Ph. D. degree at Ohio State University. Our recipient was a charter member of the IPPS Western Region and active during its formative years. He was the 6th president of the Western Region in 1965-66.

He has been recognised for his many contributions to ornamental horticulture. He has been particularly outstanding as a teacher and is well known for being a good friend of students. He has received numerous awards for outstanding teaching, including ones from the California Nurserymen's Association, the American Florist's Association, American Association of Nurserymen, the Chadwick Award, and the Burt Kallman Award. Our Awardee has