

east and west so we always roll from the south to the north side. When fall comes we simply reverse the process and roll the plastic back over to the other side and renail it. Some of the polyethylene we are using for the third year. We have tried several different plastics but the one that has proven best for us we obtain from Growing Systems, Inc., 2951 North Wells Street, Milwaukee, Wisconsin 53212.

MODERATOR SHUGERT: Dr. Snyder and I wish to thank all of you for your participation in the Question Box Session. It has been our pleasure to serve you as moderators and we will now adjourn.

Thursday Morning, August 26, 1976

The moderator for the morning's program was Richard Bosley.

UNUSUAL PLANTS IN JAPANESE NURSERIES

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Over the centuries Japanese horticulturists have developed an extraordinary number of cultivars and training techniques which are unfamiliar to American gardeners. In the spring of 1974 I spent several months in Japan visiting gardens, nurseries, botanic gardens, and natural areas in an effort to familiarize myself with the native and cultivated flora.

There are several nursery areas where unusual plants may be seen in abundance. Angyo, a few miles north of Tokyo, is one of the major centers. In this district may be found a great many small specialty nurseries, some of which may occupy 1/2 acre or less. Although in some cases the stock plants may be grown directly in the ground, more often all plants are grown in ornamental containers of varying size. Usually they have been carefully pruned and shaped as specimen plants. Most of these rare dwarf, contorted, or variegated plants will continue to be grown in this way when they leave the nursery. If they are used in the landscape, they may be planted as accents in small-scale compositions. Many similar nurseries are located in or near Ikeda and Yamamoto, south of Osaka. Among the specialties of these nurseries are bonsai and bonkei (tray land-

scapes), and the training of larger specimen trees for landscape use. The town of Utsunomiya near Nikko is a center of Satsuki azalea production. Here many of the finest growers are located on small city lots where every available space is utilized for propagation, growing, and display. In the vicinity of Kurume, on the southern island of Kyushu, there are many large nurseries which specialize in Kurume, Hirado, and other azaleas.

Of great interest to collectors are the many cultivars of *Rohdea japonica*, valued for their dark leathery leaves which may be broad or narrow, curled, twisted, or striped and mottled. Dense clusters of scarlet fruits add further interest. They are displayed in special tall blue or black glazed pots. Of equal interest for its foliage variations are the many cultivars of *Cymbidium virescens*. These are also displayed in tall containers of distinctive form. The cultivars of *Selaginella tamariscina* (synonym: *S. involvens*) are not well-known outside of Japan. These compact plants, seldom over 6 inches tall, somewhat resemble the dwarf forms of *Chamaecyparis obtusa* or *Calluna*. There is great variation in the form of the branchlets and in color of foliage which ranges from vivid green to bright yellow or orange. Especially valued are those which turn red or orange during the winter. They are displayed as single plants in small dull glazed or unglazed pots. Other upright species of *Selaginella* are also cultivated. In one nursery in Angyo we saw a large collection of *Psilotum* cultivars — some dwarf and twisted, others upright with bright yellow new shoots. There are also many handsome cultivars of *Liriope* and *Ophiopogon* noted for variegated foliage or dwarf habit; 'Black Dragon' has leaves of deep bronze color. In the research garden of the Takeda Chemical Co. in Kyoto we found a specimen of *Daphne genkwa* with exceptionally large bright rosy-pink flowers. We also saw the red succulent fruit of *Daphne odora* for the first time. *Pinus thunbergiana* 'Corticoza' is highly prized for its thick irregular corky bark. It is sometimes used as an understock for *Pinus parviflora* in bonsai work, or it may be propagated by cuttings as a specimen. *Nandina* cultivars have been selected for variations in leaf shape and color as well as growth habit. Most impressive are the extreme dwarf types only a few inches high with tiny leaflets. There is a strain of *Ginkgo biloba* in China and Japan which develops pendulous woody growths at the base of the lower branches of old trees. These are propagated by grafting for use in bonsai as well as landscape specimens. Another unusual plant which we saw in one of the bonsai nurseries in the well-known village of Omiya near Tokyo was the white-fruiting form of *Prunus tomentosa*.

Dwarf plants, whether induced by training or true genetic dwarfs, have long had a special fascination for the Japanese.

Many genetic dwarfs have come from the southern island of Yakushima, such as an *Hosta* of undetermined species. A plant of this type when grown in a fine container might be used as a small accent plant in a bonsai display. There are several dwarf selections of *Jasminum* including one with white-margined leaves. In one of the Angyo nurseries we saw a cultivar of *Morus* with extremely crinkled leaves and red fruit which was described as a great rarity. A dwarf *Ilex serrata* with abundant tiny red fruits is grown specifically for bonsai use. One typical example of a large tray landscape (bonkei) included dwarf *Ulmus*, *Ilex crenata*, *Cryptomeria*, *Rosa*, *Erica*, *Acer*, *Spiraea*, *Rhododendron indicum*, *Scutellaria*, *Serissa*, in addition to some bamboo and groundcovers of *Sedum* and *Selaginella*. All of these plants were growing in a shallow clay tray about 2 feet long and were pruned to scale.

The Satsuki azaleas are well-known in the West, but new cultivars are constantly being introduced by Japanese growers. Like the dwarf plants they are seldom used in landscape plantings, but rather are grown in containers as specimens for exhibition. Training begins with the newly-rooted cutting which is pruned to a single stem and staked, later to be wired and trained in a modified bonsai style. In central Kyushu we observed the field propagation of *Rhododendron kiusianum*, *R. obtusum*, and *R. indicum* cultivars. Some plants are grown on in the field while others are potted and trained as specimens. Superb cultivars of the large-flowering, chimaeral Hirado azaleas are to be found at the Kurume Horticultural Research Station and in a few of the nurseries nearby.

Some of the small nurseries at Ikeda and Angyo are devoted primarily to maples. *Acer japonicum*, *A. palmatum*, and *A. buergerianum* predominate among the vast array of cultivars available.

In addition to rare species and dwarf cultivars, the other major group of unusual plants to be found in Japanese nurseries are those with variegated foliage. In a photograph of a typical section of a display table at a nursery in Yamamoto may be seen variegated *Ulmus*, *Kerria*, *Camellia*, *Chaenomeles*, and *Phlox*. Other excellent variegated specimens observed included a *Clivia* with scarlet flowers, *Hemerocallis*, *Iris japonica*, *Lilium* sp. (*L. longiflorum*?), *Polygonatum*, *Corylopsis*, *Hibiscus syriacus*, *Osmanthus* sp. (*O. heterophyllus*?) with pink fruit, *Parthenocissus tricuspidata*, *Trachelospermum*, *Wisteria*, and *Zelkova*.

We visited a notable nursery near Ikeda where *Pinus thunbergiana*, *P. densiflora*, and *P. parviflora* were grown and trained for bonsai and also for landscape use. The larger trees, some of which may be 200 years old, have been transplanted

frequently and are grown on mounds, ready for easy removal. Fine old specimens sell for \$10,000 or more. Such trees are pruned, thinned, and trained with extreme care on an annual basis. The branches are fastened to a bamboo support while the twigs are tied down or pulled up with twine to obtain the desired angle. Roots are sometimes gradually exposed to produce bizarre effects. Out in the fields we saw rows of young pines in training, the branches either tied with ribbons to bamboo stakes or trained with wire around the stems.

Many of the rare plants grown in these nurseries may be found for sale in the garden departments (usually on the roof) of major department stores in Tokyo, Osaka, and Kyoto. The diversity of distinctive plant materials available in department stores and flower shops is most impressive. For example, a modest flower shop in a residential section of Tokyo contained a good selection of bonsai including *Jasminum*, *Zelkova*, *Acer*, and *Prunus mume*, as well as an excellent collection of alpines such as *Houstonia*, *Phlox*, *Dianthus*, *Rhodohypoxis*, and *Gentiana*. In this shop also were fine specimens of *Shortia* in full flower growing on moss-filled wire frames placed in a large saucer of water. The western visitor is constantly amazed by the ingenuity and passion for fine detail of the Japanese people.

FUNGICIDE ALLERGIES?

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The title for this short presentation is posed as a question and instead of singling out just fungicides I would like to broaden the scope and ask the question, "Horticultural chemical allergies, or worse?"

In our meetings of the 1950's and '60's, we were constantly reminded to use fungicides like Captan, Phaltan, Phygon and Terraclor in preventive spray-programs in our propagation. What was the attitude of the average grower or propagator to these relatively new materials? We were supposed to be very cautious, read the labels carefully and follow all the instructions we were given conscientiously.

But did we really do all those things? Thinking back to my experiences as a propagator in Lake County, I have to admit that I, as well as most of the growers that I knew and met, were rather casual and even lax when it came to spraying. After all, the labels were often not too specific as far as warnings for dangerous consequences were concerned. And word of mouth