

- Piqueras A., J.M. van Huylbroeck, B.H. Han, and P.C. Debergh.** 1998. Carbohydrate partitioning and metabolism during acclimatization of micropropagated *Calathea*. *Plant Grow. and Dev.* 26:25-31.
- SAS Institute, Inc.** 1999. Version 8.02. SAS Institute, Inc., Cary, North Carolina, U.S.A.
- Swarnkar P.L., S.P. Bohra, and N. Chandra.** 1986. Biochemical studies on initiation of callus in *Solanum surattense*. *J. Plant Physiol.* 126:293-296.
- Valero-Aracama, C., M. E. Kane, S.B. Wilson and N.L. Philman.** 2003. Effect of Stage II duration on rooting and survival of sea oats (*Uniola paniculata* L.) genotypes. 2003 Congress on In Vitro Biol. 39: 49A.
- Valero-Aracama C., M.E. Kane, N.L. Philman, and S.B. Wilson.** 2004. Comparative in vitro growth and development of easy- and difficult-to-acclimatize sea oats (*Uniola paniculata* L.) genotypes. *Hortscience* 39(4):891.
- Van Huylbroeck, J.M. and J. De Riek.** 1995. Sugar and starch metabolism during ex vitro rooting and acclimatization of micropropagated *Spathiphyllum* 'Petite' plantlets. *Plant Sci.* 111:19-25.

Seeking and Sharing Ideas from the Orient®

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INTRODUCTION

In the spirit of IPPS, this article shares some of our experiences as IPPS-SRNA international representatives to the Japanese International Plant Propagator's Conference, in Sept. 2004. This was a working trip to do the business of the IPPS, but it is customary for the host country to share their industry and culture with their guests. Representatives have an opportunity to get to know each other in an informal setting. They discuss opportunities and society concerns on the bus and at meals before entering into formal dialogue during the IPPS International Board meeting. It is a great format that serves the IPPS well.

ACCOMPLISHMENTS OF THE INTERNATIONAL BOARD — 2004

The IPPS International Board accomplished a great deal in 2004. Four significant measures were approved that will make seeking and sharing much easier for our members, and the IPPS more attractive for nonmembers to join:

- The secretaries of the regions will receive computer program updates that will make communications among regional members much more frequent, effective, and meaningful.
- Thanks to the IPPS Western Region, Vol. 1-10 of the Combined Proceedings of the IPPS will be placed on the web site this year; see <www.ipps.org>. The rest of the IPPS Proceedings will also be placed on the site beginning with the most recent volumes, followed by earlier editions. The two most recent volumes of the IPPS Proceedings will be excluded if password security concerns cannot be assured. This means that you do not have to be a member for 50 years to get full access to the IPPS knowledgebase.

- There will be a worldwide, regularly updated, electronic directory publication of our membership, sent to all members in the near future.
- The 50-year index of the IPPS Proceedings will also be posted on the IPPS web site, a work of dedication and sacrifice by International Editor, Charles Heuser.

HORTICULTURAL IDEAS FROM THE ORIENT

The horticultural experiences of the IPPS International Board and guests began with our arrival in Osaka, Japan. Our IPPS host led us from central Japan in Kyoto to Nagoya, Hamamatsu, Okura, and to Sapporo in the northern region of Hokkaido. It was a great horticultural journey.

The Japanese earn their reputation as wonderful hosts: honest, friendly, and extremely generous. Japan has 125 million people squeezed into an area the size of Montana. Like many of our metropolitan areas, you can never tell where one city stops and the next begins. We did eventually find the open country, but first there was a blur of Japanese urbanescapes. On the surface, everything began to look the same. However, for horticulturists, there were many pleasant surprises.

Ancient temples are a treasured part of Japanese heritage, and there were many. They contrasted nicely with incredibly modern architecture and engineering, which is shiny and huge in scale. Pollution was oddly absent in the amazingly quiet and clean bustling cities. Apparently, it can be done! Part of our duty and pleasure during the trip was to look for horticultural ideas to share and possibly to contrast and expose some of our own horticultural sins.

We were delighted to see that traditional Japanese gardens are not just part of formal arboreta and botanical gardens, but were an integral part of the architecture. It was also apparent that Japan was the origin of many of our plants for our landscape. Japanese maples were everywhere and towered 19 m (60 ft) tall. Fall must offer incredible color! I am sorry we missed that extravaganza. Hydrangeas, Japanese hollies, mahonias, *Ulmus parvifolia*, *Cryptomeria*, azaleas, *Pieris*, and many other familiar plants were prevalent. In fact, plants were used liberally everywhere. They were stuck in every nook and alley that urban sprawl had not covered. Where concrete covered everything, the use of potted plants showed the Japanese love and need for plants.

Early in our tour a Japanese Bonsai Master gave a lecture on the Japanese culture and heritage.

In the center of their universe, surrounded by the sun/moon, earth/soil/rock, air/sky, and water were plants. Young people may be slowly drifting away from their horticulture heritage, but it was apparent the high status that plants held in the Japanese culture. We could all learn from this philosophy.

Due to page-length restrictions, we offer some random observations that are sometimes difficult to visualize, but if you go to the url: <www.ag.auburn.edu/landscape>, pictures of the trip are posted. You may need to search on Google search engine for Japan to find this illustrated article.

The Japanese are masters of directing people through their landscapes with the use of textured walks. We sometimes see this in large American landscape architects' projects, but the Japanese use textures, varying materials, colors, and sometimes even the added danger of falling into water to divert your attention in

another direction. When you are diverted, there is always another focal point to draw you in their intended direction. Paths widen and narrow as they diverge to show main and secondary routes. Rocks, stones, and water are prevalent features in their gardens.

While moss is occasionally used in U.S.A. landscapes as a groundcover, the Japanese use it frequently, and in large areas with incredible results. The undulating mat of soft green offers a cooling and relaxing feeling beneath the trees, and displays textural contrast to the more coarse shrubs and perennials. These concepts are worthy of consideration for increased use in our landscapes.

We did not see great technological advances in the nurseries, but we were amazed with the patience, masterful knowledge, and talents of directional pruning, staking, and other measures of control utilized by the growers. While there are some U.S.A. nurseries that produce older trees, our economy does not allow 2 to 3 generations of nursery families to culture the same plant for eventual sale. The Italians and Germans still do this on a small scale. Twenty- to fifty-year-old plants were not uncommon in the nurseries we visited. A few sales at \$20,000 to \$50,000 per specimen supported the families and perpetuated their businesses. Some nurseries revealed that some of the plants were dug from the wild and trained for 5 or more years to offer shortcuts to the process. We think this is a nursery practice we can appreciate, but not commercially emulate.

Grafting was a common practice among Japanese growers utilizing selected rootstocks that would offer various survival and growth characteristics commonly used in U.S.A. fruit production. In our country, we mostly talk about the potential this practice offers for the landscape industry. This experience did conjure thoughts of utilizing grafting practices for niche nurseries in America. There continues to be opportunities in this area for the talented propagator with imagination.

The greenhouse operations were much more current in production technology and marketing. We observed a container system that was new to us, but may be known to U.S.A. floral pot crop producers. The container was white plastic, in a 2- to 3-qt size, with an air-pruning, open-lattice bottom with four legs that held the container snugly to a trough/gutter irrigation system. The center of the base of the pot had a pedestal that extended into the center of the trough with an open base, allowing for capillary water uptake from the trough. For marketing purposes, a saucer was designed to easily snap onto the base of the pot for continued sub-irrigation watering by the consumer. Great functional design! If we do not have it, it is worth finding or developing.

The Japanese are known for their incredible number of plant cultivars developed by their many corporate and backyard breeders. We got to experience their cactus collections and commercial production of these crops. The colors, flowers, shapes, sizes, and textures of the cactus collections overwhelmed us. They were more diverse and numerous than our daylilies. Growers were good at creating cactus gardens with artistic add-ons such as birds or cute comedy characters that gave value-added and finished products to their customers. Several members of our group placed orders for containers of these sure sellers before leaving the site. Given the unknowledgeable, time-constrained customer, a finished product is a dominant part of our retail industry, but one the nursery retailers have not fully exploited.

We noted that the Japanese also export labor from other countries. Similar to large box stores in the United States, which require jobbers from nurseries to

maintain and display products — the Chinese produce many of the liners shipped to Japan. Along with the liners, come Chinese workers stay with the crop to help the Japanese retailers finish them for sale. (Interesting, but hopefully not part of our future.)

Although we did not visit the famous small nurseries around Tokyo with their mouth-watering collections of rare and unusual plants, we did visit a Floriade display (Pacific Flora 2004, <http://m.flora2004.or.p/k/>) that offered several 100 acres of display gardens and horticultural wonders that reminded us that we are growers not designers. Other countries have been very successful in these Horticultural World Fairs, but for some reason U.S. attempts have not been as successful. It is a great venue to show off the possibilities within horticulture.

Artists used nursery products integrated with hardscape and genius to create a wonderland of horticultural “WOWS”! Here we saw collections of new plant releases from many genera that were overwhelming. There were two plant groups beyond the cacti that set our mind spinning on how little we knew about our own world of plants. Bamboo and begonias were two examples on our trip that offered this humbling realization.

Bamboo is a dirty word among many gardeners in the United States, but it is the universal plant of life among Asians and other parts of the world. There was a bamboo display that illustrated the beautiful diversity of the cultivars of plants available and their uses. There were numerous examples of bamboo utilized for garden fences, edges, walls, walks, fountains, sculpture, furniture, container plants, and other uses. There was a unique display of groundcover species of many colors, textures, and sizes that would be beautiful in our gardens. We did note the native vegetation of bamboo (*Sasa veitchii*), had overtaken woodland areas beneath the trees in solid masses, but others species are not as invasive and would have a place in our gardens, certainly in areas of concrete and asphalt confined spaces. Bamboo is a tough sell in the United States, but it has a world of beauty we are sorrowfully missing.

We experienced the 8th wonder of the world in the “Disneyland of Begonias”. If you are cocky in your plant knowledge and think you have seen much of what the world has to offer in horticulture, the indoor display of thousands of begonias of every designer size, color, modern-art leaf form, and shape was a special eye opener. There is no way to elaborate but to say there are opportunities for nurseries to expand our horticultural pallet for years to come and offer consumers mind-boggling choices for their homes and gardens.

An odd observation for discussion that we had seen in China was the use of in-floor lighting. Many directional and advertising signs, which could be a dangerous or ugly are in the floors and sidewalks. Our thoughts were that there is an opportunity for tasteful design and display of lights in decks and garden areas that have not been exploited in the U.S.A. During the disco era, there was a brief use of this idea with lighted dance floors. Muted, soft, lighted floral patterns under patio tables, planters, foot paths, and other areas may offer a whole new business opportunity for our industry.

A final parting note from the Japan conference is that a new rooting compound was introduced and explained in one of the presented papers at the conference. The compound(s) are forms of succinamic acid, which have different chemistry than IBA, but may be safer and more effective in some uses. The product is not internationally available, but is commercially produced and will be marketed by Snow Brand Seed Co. and Asahi Chemical Co.

CONCLUSION

This was just a small sample of our horticultural adventures in Japan. The trip illustrates that the IPPS is truly an international society, with much to learn and share beyond our regional borders. We encourage the IPPS-SRNA membership to take advantage of IPPS regional meetings around the world to capture some of the great experiences available. All regional meeting activities and schedules are available on the IPPS website <www.ipps.org>. Taste what the rest of the IPPS world has to share!

Offshoot Production of Perennial Groundcovers in Porous Ceramic®

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INTRODUCTION

Many groundcover plants such as *Ophiopogon*, *Hosta*, *Hemerocallis*, and *Liriope* are marketed and sold as bare-root divisions. Dividing and barerooting these plants is a labor-intensive process, whether container grown or field grown. Profile™ (Profile products LLC, Buffalo Grove, Illinois) is a calcined clay product whose base minerals are illite clay and amorphous silica. The raw product is heated in a kiln at 1500 °C+, which permanently changes the base minerals to a stable calcined clay (also called porous ceramic) particle. The resulting particles have approximately 74% pore space with half of the pores available for capillary (water holding), and the remaining half for noncapillary (air and drainage) pores. The final product also has a cation exchange capacity of 33 meq/100 g. These products have been used for many years as soil amendments in golf course greens to improve soil structure. There have been comprehensive reviews on these and other soil amendments in turfgrass (Daniel and Freeborg, 1979; Grunthal, 1996). Past research has indicated an increase in bermudagrass (*Cynodon dactylon*) tissue when soil was amended with ≥ 40% Profile™ (Wehtje et al., 2003). *Rhododendron* sp. has been shown to grow exceptionally well in media containing calcined clay at up to 50% by volume (Carlile and Bedford, 1988).

On 23 Feb. 2003, three bare-root single-bibb divisions of *Ophiopogon japonicus* and *O. japonicus* 'Nanus' were potted into 20-cm-wide (8-inch) by 13-cm (5¹/₈-inch) tall containers [C-350 (small mum pan), Nursery Supplies Inc., Chambersburg, Pennsylvania] using either 100% aged pinebark, 8 pinebark : 2 peatmoss (v/v), 100% perlite, 100% 24 × 48 Profile™ porous ceramic [(P1), Profile products LLC, Buffalo Grove, Illinois], or 100% 5 × 50 Profile™ porous ceramic (P2). Hardware cloth was placed in the bottom of each container to prevent loss of substrate through container holes.

Containers were placed in a greenhouse and liquid fed each irrigation with 15N-2.1P-12.3K (15-5-15 Cal-Mag, The Scotts Co., Marysville, Ohio). On 18 June 2003, plants were moved to an outdoor shade structure covered with 40% shade cloth, top-dressed with 14 g of 18N-2.5P-9.8K (18-6-12 The Scotts Co., Marysville, Ohio) and overhead irrigated as needed. On 24 Sept. 2003, four workers were randomly