The
Slipper Orchid Alliance Newsletter

Volume 1, Number 3 Fall 2000

Recent Slipper Orchid Forums

By Richard Grundy

This fall, I was fortunate to attend two orchid forums on the East Coast with presentations for slipper orchid afficionados: the 45th Eastern Orchid Congress in Williamsburg, Virginia on October 19-22, 2000, and the 3rd Slipper Symposium in Kissimmee, Florida, on November 4, 2000. As expected, these were two uniquely different but excellent events.

45th Eastern Orchid Congress

For its 45th outing, the Eastern Orchid Congress convened in Williamsburg, Virginia, in conjunction with the AOS Board of Trustees meeting from October 18 through 22, 2000. Through the efforts of our hosts – the Virginia, Peninsula and Tidewater Orchid Societies – the show and lectures were a major success.

A full program was available for the slipper orchid afficionado. The highlight of the program was a presentation on Friday afternoon by Hal Horwitz from Richmond, Virginia, entitled "*In Praise of Native Orchids.*" Hal, and his wife Helen, have traveled from Florida to Newfoundland to Alaska photographing native orchids. In his travels, he has photographed the 57 (now 58) orchid species native to North America, including eleven (11) slipper orchids. His lecture is a unique multi-media experience which should be seen by all orchid lovers.

Friday morning was crammed with culture information for Paphiopedilum and Phragmipedium growers. The key-note speaker was Dr. Harold Koopowitz who was co-sponsored by the Slipper Orchid Alliance. He spoke at length on the cultural requirements of various categories of slipper orchids, as reviewed elsewhere in the SOA Newsletter.

Marilyn LeDoux of Windy Hill Gardens in Labadie, Missouri, followed him with a survey of "Incredible Exotic Phrags", with an emphasis on Phrag species. She observed that following the first registered Phrag hybrid – Phrag. Dominianum – in 1870, between 1870 and 1906, sixty percent of the 35 hybrids registered relied on Phrag. schlimii in their parentage. Interest in Phrags then waned until 1975 when Phrag. Praying Mantis (longifolium x bossierianum) was registered. There was even greater interest in Phragmipediums following the discovery of Phrag. besseae. As of July 2000, there now are 189 registered hybrids and four crosses with Paphiopedilums. [A copy of Marilyn LeDoux's compendium is available by request from the SOA.]

Her presentation was followed by a panel discussion on Phragmipedium Culture by such stalwarts as Marilyn LeDoux, Nancy Volpe of New Jersey, and Glen Lehr of New World Orchids in Manchester, Michigan, who grows orchids in Ecuador and Costa Rica.

3rd Slipper Symposium, Kissimmee, Florida

Through the efforts of Mary and Paul Phillips the 3rd Slipper Symposium was convened in Kissimmee, Florida. The Symposium's program began in the morning with a review by Tom Kalina of Fox Valley Orchids entitled "Slippers for

SOA Mission Statement

Promote broader understanding of all genera and species of slipper orchids including paphiopedilum, phragmipedium, and cypripedium, as well as their conservation in natural habitats and under cultivation. Promote member's exchange of information at regional, national and international forums or seminars and advance scientific and horticltural studies of slipper orchids and their hybrids.

the New Millennium." The review provided an excellent survey of new species of Paphs and Phrags and their potential uses in hybridization. While the title was the same as that used at the 20th NCOS Paph Forum (reviewed in the Spring 2000 SOA Newsletter), Tom's presentation drew on his more than 30 years of experience with orchid hybridization to present a distinctly different but stimulating talk. There followed a refreshing historical review by Tom Brown of the activities of the Eric Young Foundation on the British Channel Island of Jersey. This presentation included a review of the Foundation's early breeding program with complex Paphiopedilums through the more recent genetic breeding program begun by Professor Don Wimber in 1986. Subsequently, this genetic breeding program was extended by the Foundation to its Phrag breeding program, as discussed elsewhere in this SOA Newsletter.

The afternoon session began with a provocative travelogue by Jerry Fischer of Orchids Limited which reviewed his several field surveys of "Borneo Paphiopedilums in Their Natural Habitats", including lowii and sanderianum. His presentation provided a cogent description of the trials and sensations experienced by the orchid connoisseur when he ventures out of his greenhouse into the jungles of Borneo. His photographs are fantastic. If you ever have the opportunity to hear Jerry Fisher's presentation, it is well worth the effort to get there.

The program concluded with a detailed review by T. Mark Thurmond of "The USDA's Views of CITES and Orchids." Mark is a botanist with the USDA Plant Inspection Station at the Orlando International Airport. His review provided a practical guide on the procedures that need to be followed by orchid hobbyists who wish to import artificially propagated orchids, as discussed elsewhere. The day's events concluded with an informal barbeque hosted by Ratcliffe Orchids. Thank you, Paul and Mary!

Phragmipedium Culture

By Marilyn LeDoux, Windy Hill Gardens, Labadie, MO

Phragmipediums are New World ladyslipper orchids that grow from Mexico through central South America. Most are terrestrial (grow in the ground) or lithophytic (grow on rocks), but a few species can sometimes be epiphytic (grow on trees). The tree dwellers are primarily the long-petaled caudatum types. Some species prefer to grow in the splash zone of waterfalls and on streambanks and can often be submerged during periods of heavy rain. These streams and waterfall dwellers include the species caricinum, kaieteurum, klotzschianum, lindleyanum, longifolium, pearcei, and sargentianum. Phrags flower at various times but most heavily in the late winter and spring. Mature plants of many sequential-blooming species can be in bloom for six months or more.

Light. Light needs for Phrags range from bright (cattleya-like, 3,000 to 4,000 footcandles) for the long-petaled caudatum types and xerophyticum, to medium low (Phal-like or mottled leaf Paph-like, 1,500 to 2,000 footcandles) for besseae and schlimii. Growing these lower light Phrags on a lower bench in a greenhouse usually provides both the reduced light levels and somewhat cooler temperatures they prefer.

Temperature: Most Phrags prefer intermediate temperatures with nights in the upper 50's to the mid 60's. However, besseae and schlimii can tolerate and even prefer somewhat cooler temperatures. If kept much cooler in the winter, keep them somewhat drier as well, not soggy wet. Phrag xerophyticum prefers temperature on the warmer ends of the ranges given above.

Humidity and air circulation: Grow in humidity above 50 percent if at all possible. Plant groupings on pebble-trays with water between the pebbles is very helpful when growing in the home. Caudatum types are most tolerant of less humidity, as long as the roots remain moist. Constant air circulation, especially in a greenhouse or grow room is very important. In higher humidity growing areas such as these, growths that do not dry out by evening can develop a bacterial rot. Constant air circulation can help prevent this problem. If a problem does occur, pull off the infected leaves and use a bactericide. This problem can occur on any Phrag but is most prevalent on caudatum types and their hybrids.

Water: Good quality water is very important for growing Phragmipediums. Tap water with low dissolved solids is OK, but rain water or reverse osmosis (R.O.) water is usually even better. Flush the media and roots well each time you water. Most phrags should be kept moist at all times; however, the caudatum types and xerophyticum can become somewhat drier between waterings. Some people have great success growing their moisture-loving Phrags sitting them in saucers of water. To help prevent bacterial rot problems do not water over the tops of the plants on cool, cloudy days if the growths will not dry out by evening.

Fertilizer: In general, Phrags can take more fertilizer than Paphs, but feeding too heavily can cause leaf tip burn. When using rain or R.O. water be sure to use a fertilizer with essential micro-nutrients, such as Dyna-Grow. I prefer using water-soluble or liquid fertilizers at one-fourth to one-half

Upcoming Events

January 13 and 14, 2001
45th Paphiopedilum Guild Meeting and Orchid Show
The Sea Cliffs Resort, Shell Beach, CA
Membership in the Paphiopedilum Guild is required. Registration and membership information may be obtained from the Paphiopedilum Guild, 1699 Sage Ave., Los Osos, CA 93402 or by email through Patti James at orchid@orchidhouse.com.

February 17, 2001
NCOS's 2001 Paph Forum
The NCOS's 21st (2001) Paph Forum will be held on Saturday, February 27, 2001, at the U.S. National Arboretum, Washington, D.C. Speakers will include Paul Bechtel of Dragonstone Orchids, California; Mr. Hsiao of In-Charm Orchids of Taiwan; and Stig Dahlstrom of Selby Gardens, Florida. In addition, there will be sales, as well as an extensive exhibition table judged by AOS judges. Details may be obtained from Gordon Slaymaker at 703-644-6424 or gslaymaker@att.net.

May 19, 2001
The Slipper Orchid Alliance Spring 2001 Forum
Raddison Hotel and Conference Center, Plymouth, MN
Please mark your calendars for the SOA Spring Forum which will include speakers, sales, auction and banquet. Registration and membership information will be distributed to all SOA members and also may be obtained from the Slipper Orchid Alliance, 950 Wikiup Dr., Santa Rosa, CA 95403-1305 or by email from sllipperorchidalliance@att.net.

the recommended strength for three or four waterings then flushing thoroughly with clear water every fourth or fifth watering. Less fertilizer and/or a blossom booster (higher phosphorous) fertilizer should be used in the fall and winter.

Repotting and potting media: Repot every one to two years in fresh mix. The best time is usually right after flowering, but Phrags are very tolerant of repotting anytime. I prefer the following basic potting mix for my Phrags:

9 quarts fine bark (Sequoia).
3 quarts perlite or sponge rock.
3 quarts fine to extra fine charcoal (#3 or #4)
3 quarts fluffed Canadian peat or Pro-Mix HP (or similar peat-based mix).
1/ 2 cup bone meal.

For Phrags (excluding xerophyticum) potted in 5-inch and larger pot sizes, I like to add in 1/4 to 1/3 medium sequoia bark. I also often add in 1/4 fluffed rockwool, especially for the more moisture-loving types of Phrags. I never use rockwool in my xerophyticum mix.

For Phrag (Mexipedium) xerophyticum, I add to the above formula:

1/4 cup dolomitic lime.
1/4 more charcoal for good drainage to any size part of this mix separated out. For example, for two cups of the above mix, I add ½ cup or more of extra fine charcoal.

I also use the above mix, minus the extra charcoal but with the dolomitic lime, for my Paphiopedilums. I also like to use styrofoam peanuts in the bottoms of my pots for good drainage.

Happy Growing!

Breeding Program at the Eric Young Foundation

At the 3rd Slipper Symposium in Kissimmee, Florida, Thomas Brown offered a refreshing historical review of the activities of the Eric Young Foundation on the British Channel Island of Jersey. Since its inception in 1973, the Paphiopedilum and Phragmipedium breeding program at the Foundation has evolved into perhaps the most scientifically advanced breeding program in the world. The program began with complex Paphiopedilums. However, following the addition of Professor Don Wimber to the team in 1986, the program expanded in scope to emphasize genetic breeding techniques.

Over the years, the Foundation has received many accolades beginning in 1973 with its first major success – the Gold Medal at the London Orchid Show. Since then the Foundation has received numerous awards at such events as the 1996 Chelsea Flower Show, the 2000 London Orchid Show, and the 2000 Chelsea Flower Show, as well as the Williams Memorial Medal for the last nine years – five of which were for Phragmipedium hybrids. Among its plant awards is Paph Saint Ouen (Green Gold x Mitzi) 'Glasgow', AM/RHS, which won Best in Show at the 1993 World Orchid Congress in Glasgow, Scotland, and later was awarded an AM/RHS at the London Orchid Show in March 2000. As round flowers continued to expand and get bigger, the

Foundation began to explore other shapes and colors.

Tom Brown observed that a new concept for the Foundation's breeding program that ties together different types of Paphs is Paph. Victoria Village (micranthum x Vanda M. Pearman) 'Isle of Jersey', AM/RHS. Another avenue of exploration is the striking combination of Paph. (micranthum x rothschildianum) 'Mount Millais'. However, while this is one of the best crosses of it type, when used in breeding there isn't any seed. Other examples are Paph. Gloria Naugle 'Jersey', AM/RHS and Paph. Gloria Naugle 'Rozel', AM/RHS, which are sterile.

Breeding Experience

Over the years the Foundation had tried to overcome the inherent genetic barrier created when two genetically dissimilar types of Paphs bred together produce offspring that are sterile. Mr. Brown observed that when the two Paphs bellatulum and glaucophyllum were crossed to form Paph. Charles Sladden, its offspring never produced seed because its parents were so far apart genetically. This is attributed to the offspring having an unbalanced or uneven number of sets of chromosomes. For example, an organism, such as an orchid, will have the normal two (diploid or 2N) sets of chromosomes. When crossed with a genetically dissimilar species the offspring may have three (triploid or 3N) or four (tetraploid or 4N) sets of chromosomes. Those offspring with an uneven set of genes (3N) tend to be sterile, while those with a balanced set of genes (2N or 4N) are fertile.

A useful example of what happens when tetraploids (4N) are mixed together is the experience with the use of Paph. Winston Churchill 'Indomitable' (Eridge x Hampden), which was registered in 1951 by Lowes Orchids, as a parent found it to be fertile. This was attributed to it being a tetraploid (4N), which was subsequently confirmed. Similar experience was found with a group of Paph. Orchilla (Paeony x Redstart). Both of the parents were tetraploids and produced one of the finest red flowered Paphs of the 1960's. This cross happened by accident and Tom Brown believes that the hybridizers didn't fully appreciate what they had. Nevertheless, this cross still serves as a fine example of the concept that the Eric Young Foundation is pursuing.

Meanwhile, the Foundation continues to produce such pretty hybrids as Paph. Rolfei (rothschildianum x bellatulum) 'Saint Helier', AM/RHS.

Genetic Breeding Program

Professor Don Wimber was invited to the Foundation in 1986 to confirm the use of chromosome counting in the Foundation's breeding program. The scientific concept is to double up the chromosomes in both parents so that their seedlings will become viable parents in their own right. This not only enables the breeding program to continue on but it offers the breeding program with the opportunity to produce the widest possible scope of different shapes and colors in the future. An example of the use of these techniques is Paph. Gary Romagna 4N (rothschildianum 'Mont Millais' x Saint Swithin). In recognition of Don Wimber's assistance in the Foundation's breeding program, the Foundation named Phrag. Don Wimber for him.

Having proven the use of tetraploid (4N) parents to make viable offspring, the Eric Young Foundation is proceeding to remake some earlier crosses that were infertile; for example, Paph. Ultor (sanderianum x lawrenceanum) registered by Young in 1903 and Paph. Charles Sladden. This enabled the hybridization of Paph. Elizabeth Castle (Winston Churchill x Charles Sladden) because both of the parents are tetraploid (4N). The cross was put forward this year for an award at the London Orchid Show.

Similarly, it was difficult to get seed with Paph. Vanda M. Pearman until it was once again remade as a tetraploid (4N). Then it was possible to hybridize Paph. Belle Hogue Point (Charles Sladden 4N x Vanda M. Pearman 4N) and Paph Victoria Village 'Trinity' (micranthum x Vanda M. Pearman 4N). Another outcome of this breeding program is Paph. Freckles 'Mont Millais', AM/RHS which is a tetraploid and gives the Foundation a new white tetraploid for its future breeding program.

Over the years, the Foundation's genetic breeding program has been expanded to include Phragmipedium. Among its successes is Phrag. Don Wimber 4N. The first of the Don Wimbers to be awarded was in June 1998. Other hybrids include Phrag. Memoria Dick Clements (sargentianum x besseae) 'Trinity', FCC/RHS; Phrag Fliquet 4N (Grande x Memoria Dick Clements); and Phrag. Jason Fischer 'Jersey', FCC/RHS, as well as Phrag. Jason Fischer, 'Victoria Village' (4N), FCC/RHS.

It is hoped that their new Phrag. besseae 'flava' x longifolium – the first mostly yellow Eric Young – will produce a yellow Don Wimber. However, once you are three generations away from the species it is very hard to get seed from subsequent generation.

Conclusion

In conclusion, Tom Browne observed that just like searching for the pot of gold at the end of the rainbow, we will always be searching for that ever perfect orchid. And no matter what's perfect to you, in the end it all comes down to perception and individual taste.

[Currently, the Foundation is closed to the public for renovation but should be reopened between May and July 2001.]

As reported by Richard Grundy

Phragmipedium *besseae* and its Hybrids

Charles H. VanDyke

Although Phragmipediums have been grown and hybridized by orchid enthusiasts since well before 1900, until recently general interest in growing this genus was rather limited. This can be attributed at least in part to a lack of understanding the growing conditions needed, and the absence of suitable species that would impart desirable qualities to new hybrids. The situation changed dramatically in 1981 when Mrs. Elizabeth (Libby) Besse, while on a botanical expedition in northern Peru with members of the Marie Selby Botanical Gardens in Sarasota, Florida, discovered a new Phragmipedium with red flowers. From the initial description and size, the orchids first were thought to be Phrag. *schlimii* but on further analysis from both their location (eastern slope of the Andes) and red color (Phrag. *schlimii* has pink or pinkish white flowers), the plants were classified as a new species. The finding was reported by Calaway Dodson and Janet Kuhn, and the new species was named Phrag. *besseae* in honor of the discoverer [1]. Since its initial discovery in Peru, variations of Phrag. *besseae* also have been found in several locations in Ecuador. Although very few plants or divisions of the original Peruvian and Ecuadorian forms exist today, this species has been propagated by orchidists and is readily available to Phragmipedium growers.

The first person to successfully proagate Phrag. *besseae* from wild stock was Dr. G. R. Clements from Birchwood Orchids in Monee, IL. Unfortunately, he passed away while the seedlings were still in flask. Fox Valley Orchids, Ltd., bought Birchwood Orchids from the Clements' estate in 1990, including these flasks. They were a selfing of Clements' Phrag. *besseae* '#220'. From this original group of seedlings came 'Fox Valley' FCC/AOS and 'Fox Valley Flame' AM/AOS. Sibling these two awarded clones gave us 'Fox Fire' AM/AOS. All of these are Peruvian clones. The reason most people were unsuccessful in propagating Phrag. *besseae* early on was the seed coatings excrete an anti-germination chemical whose function was to prevent densely populated swarms in the wild. Unfortunately the chemical also effectively prevented germination in flask. Once Dr. Clements figured this out, he developed a phenylaniline compound which neutralized the anti-germination chemical and germination in flask was then successful. Virtually all current labs now know about this. Because of Clements' early work, Fox Valley Orchids, Ltd., was the first to bring the Peruvian form of Phrag. *besseae* to market in saleable quantities.

Tom Kalina
Fox Valley Orchids, Ltd.

While Phrag. *besseae* is now available from many sources, it can be somewhat difficult to grow in home or greenhouse conditions, and care must be taken to have it survive and produce its characteristic flowers. Hybrids that are produced by crossing it with other Phragmipediums are quite outstanding and easy to grow and flower. In this article, a review of Phrag. *besseae* is presented along with a description of a few of its notable hybrids.

Varieties and Descriptions.

Shortly after the discovery of Phrag. *besseae* in Peru, colonies of the species were found growing in Ecuador [2]. The distribution was widespread, but the plants were only found in specific locations. Many plants were sold and exported without stating their specific source, and the origin of a particular Phrag. *besseae* may not be known with certainty. The size, shape, and color intensity of the flowers from the native plants varied considerably. Today, the flowers of Phrag. *besseae* originating in Peru or Ecuador that are red or red-orange and have a flat form with relatively wide, round to oval horizontal petals are called the Peruvian form.

A variety of Phrag. *besseae* that had significantly different characteristics was discovered in Ecuador by Dennis D'Alessandro. This variety, called Phrag. *besseae* var. *dalessandroi* after its discoverer, was found growing in only one very limited, approximately 200 sq. ft., area. Its flowers have narrow downswept petals, and the overall coloration is more orange or yellow-orange than the red Peruvian form. A characteristic bright yellow blaze is present where the petals and dorsal sepal meet. The inflorescences of this form have more branching, and the plants are more compact with rhizomes that are shorter than the Peruvian form. The *dalessandroi* form, only formally described in 1996, produces more seed pods in the wild and is fairly easy to grow. Owing to its distinguishing characteristics, it was given the species name Phrag. *dalessandroi* by Calaway Dodson and Olaf Gruss in 1996 [3]. However, questions about this have been raised and most citations refer to it as Phrag. *besseae* var. *dalessandroi* [4]. As a specific variety, it now is available under this name from a few commercial sources. It is a highly desirable form to use in hybridization, mostly because of its ability to impart branching characteristics and desirable coloration features to new Phragmipedium hybrids.

Photographs showing a comparison of the *dalessandroi* (Ecuadorian) and Peruvian types of Phrag. *besseae*, and a comparison of the size and characteristics of the diploid (2N) and rare tetraploid (4N) Phrag. *besseae* var. *dalesandroi* are given below [5]. (Photographs were obtained from the Piping Rock Orchids Website and used through the courtesy of Glen Decker and Michael Tibbs.)

Phrag. *besseae*
(left flower - Phrag. *besseae* var. *dalessandroi* - Ecuador type; right flower - Phrag. *besseae* var. *besseae* - Peruvian type)

Phrag. *besseae* var. *dalessandroi*
left flower - (4N) / right flower - (2N)

Next is a photograph of the cross of the *dalessandroi* form with the Peruvian form of Phrag. *besseae* .

Phragmipedium produced by crossing the *dalessandroi* and Peruvian type of Phrag. *besseae*. (Photograph obtained from Glenn Decker and used with permission.)

The rarest variety of Phrag. *besseae* is referred to as the "Paute" form of Phrag. *besseae*. Tom Kalina of Fox Valley Orchids, Ltd. notes [6], "The flower can be larger than the Peruvian variety - albeit more star shaped and with gracefully downswept petals." He also adds, "The flower color can be much brighter and more saturated than the Peruvian form - with more orange in the red base color creating a true vermilion." It is pointed out that to date many of the flowers from this form have had varying degrees of petal and sepal reflexing, a characteristic some may not prefer. A photograph of a very impressive blood-red Ecuadorian Phrag. *besseae* "Paute" is shown below.

Phrag. *besseae* "Paute" ('#1' x '#2')
(Photograph obtained from Fox Valley Orchids, Ltd., and used with the permission of Tom Kalina.)

Another form of Phrag. *besseae* is the variety that has yellow flowers. It was found by a chance discovery in a shipment of other Phrag. *besseaes*. As the photograph shows, the flowers truly are yellow with no red or orange blush. This form is called var. *flavum* (or *aureum*) or forma (fma) *flavum*.

Phrag. *besseae* var. *flavum* 'Star Burst'
(Photograph was obtained from Piping Rock Orchids Website and used with permission.)

Fox Valley Orchids Ltd. initiated breeding studies of this variety, and their success made the yellow form available to the general orchid community. It is now available from many sources and is being used to develop many new flava colored Phragmipedium hybrids.

The first Phrag. *besseaes* to receive American Orchid Society (AOS) awards came from a collection of plants from Ecuador. The first cited was a 90 point FCC for Phrag. *besseae* 'MAJ' exhibited by MAJ orchids in 1986. A second plant from the same Ecuadorian batch, 'Krull-Smith,' exhibited by Krull-Smith Orchids received a 90 point FCC in 1987. The 91 point FCC Phrag. *besseae* 'Fox Valley' awarded in 1993 has the carmine red color and rounder petals that are characteristic of the Peruvian form. Many Phrag. *besseaes* with excellent color and form have been awarded over the years; however, another characterized as the Ecuadorian form, Phrag. *besseae* 'Stacey Ann', exhibited by Agnes Atkinson in 1993, received the highest AOS award given to this species to date, a 92 point FCC. Its description is: [7]

> "One extremely flat, large, brilliant orange flower and two buds on one inflorescence; pouch bright sulfur-yellow, striped brilliant orange in pattern typical for Ecuadorian form; staminode yellow, overlaid orange; substance heavy; texture sparkling diamond dust, satin. Nat. spr. 8.2 cm, 6.3 vert; ds 1.9 cm w, 3.3 cm l; pet 2.2 cm w, 4.2 cm l; syn 2.6 cm w, 3.2 cm l; pouch 2.6 cm w, 2.9 cm l."

There have been 62 AOS awards (20 HCCs, 34 AMs, 7 FCCs and 1 CCM)granted to Phrag. *besseaes* through 1999, the most awards being given in 1995. Two of the HCCs and 2 of the AMs were for the yellow *besseaes*.

Cultivation.

Shortly after their discovery in Peru about 20 Phrag. *besseae* plants were brought back to Selby Gardens, and three were sold at their annual auction there for $1,700 each. As the new species became known, many were taken from their habitats and sold. However most died, some possibly due to damage incurred in collection, but also because the buyers did not know the conditions for growing them successfully. Important factors for growing quality plants of Phrag. *besseae* are: water quality, growing conditions, and fertilizer. [6,8] Other than finding an occasional mealybug on the plants, insects usually are not a problem with growing this species.

Phrag. *besseae* requires so-called "clean" water, i.e., water that has very low total dissolved salt (TDS) content. While there are some regions of the country that appear to have municipal water supplies that are acceptable for Phrag. *besseae*, in general, rainwater or water purified by distillation or reverse osmosis (RO) is strongly recommended and almost essential. The plants are reported to grow in nature with a pH of 5.5 - 6.0 at the root zone. However, for watering and fertilizing purposes, the pH can vary although it should be kept on the acidic side (pH <7). Most recommended pH values in the literature are between 6.0 and 6.8.

As with other Phragmipediums, the roots of this species should not be allowed to dry out. Lack of water will lead to leaf-tip dieback. A moist potting medium is required, but Phrag. *besseae* prefers not to be kept as wet as other Phragmipediums. Sufficient humidity for the plants is supplied by the damp potting medium, or by keeping the pots over trays containing gravel and water. In their natural habitat, they do not depend on a lot of rainfall, but thrive growing on lithophytic mosses along semi-shaded wet embankments where water continually seeps through the roots. The plants are found at 3,600 to 4,200 ft. (1,100 to 1,300 m) elevations suggesting relatively cool growing conditions. Phrag. *besseaes* grown under cool conditions and somewhat subdued light generally do well and produce flowers that have a preferred dark red coloration. However, most growers recommend intermediate temperature conditions for growing this species (e.g., summer temperatures 80 ^{O}F day and 60 ^{O}F night with winter temperatures about 5 ^{O}F less in each case). Fewer cultural problems arise when the species is grown at the intermediate

temperatures. Under cool winter and spring conditions plants must be kept somewhat drier with adequate air movement since a soft brown bacterial rot is prone to develop at the base of the leaves. Rot can also occur if water is allowed to collect in the leaf axils. If this problem does appear, the leaves that are affected should be removed and the plant treated with a bactericide such as Phyton-27. The wound where the leaf is removed can also be treated with cinnamon or sulfur.

While the plants of Phrag. *besseae* can bloom at any time of the year, the best flowers, particularly with regard to color, are produced in early spring. In their habitat, plants grown in relatively bright locations tend to grow in compact clumps. In shadier conditions they tend to produce long rhizomes. In general cultivation, Phrag. *besseae* generally is grown in less light (1,000 to 2,000 footcandles) than most other Phragmipediums (3,000 to 4,000 footcandles), and easily can be grown under fluorescent lights. In general terms the light required is similar to growing Phalaenopsis or mottled-leaf Paphiopedilums. In the summer, if too much light is a problem, the plants can be grown under benches for diminished light and cool conditions, providing there is adequate air movement. The plants have an annoying tendency to produce long rhizomes as they produce new growths. Usually these can be buried so that roots can form on the new growths which then can be separated into new plants.

Various potting mixes have been described for growing this species. Most are variations of the standard bark, perlite, and charcoal orchid mixes. For example, a seedling mix recommended by Fox Valley Orchids is 6 parts fine fir bark, 1 part coarse perlite, 1 part #3 charcoal, 2 parts rockwool [6]. Some growers are successful using rockwool itself with charcoal (10 %) and coarse perlite added (35%). Sphagnum moss has been used as well. A newer mix recommended by Bob and Lynn Wellenstein of Antec Laboratory consists of coconut husk chips (CHC), aliflor, charcoal, and sandstone. [9] Using this mix, they report that Phrag. *besseae* can be grown on the benchtop in much warmer and brighter conditions in the summer than when bark mixes were used. Most growers who use bark based mixes recommend transplanting Phragmipediums every 6 to 12 months.

Phrag. *besseae*. is not a heavy feeder and will grow best using less fertilizer than used for Paphiopedilums or even other Phragmipediums. For example, Fox Valley Orchids recommends fertilizing Phrag. *besseae* once every fifth watering (10 days) in the spring and summer and once every 8 waterings (16 days) in the winter. A dilute fertilizer concentration of 1/4th teaspoon per gallon is sufficient. Using excess fertilizer or tap water can result in leaf-tip dieback due to salt buildup. While many fertilizers use a compound called urea to provide the main source of nitrogen, many growers recommend the use of urea-free or low-urea formulations for fertilizing Phragmipediums and other orchids.

As a word of caution, adding fertilizers to distilled or reverse osmosis water can lead to very low pH values for the solutions. The measured pH of a fertilizer solution made up by adding 1/4 tsp of Dyna-Gro 7-9-6 to a gallon of RO water is approximately 3.7. The pH can be raised by adding small amounts of dilute potassium hydroxide, a solution called pH-Up (available from hydroponics supply sources), or a silicate material called “Pro-TeKt” sold by Dyna-Gro. Inexpensive pH meters and TDS meters are available and recommended particularly if you wish to check these variables in your water supply and fertilizer solutions.

If distilled or RO water is used, one must be sure that all the nutrients required for proper growth are present in the fertilizer being used. Calcium and magnesium are not included in many commercial fertilizers since these elements are normally present in most ground water supplies. Compounds containing calcium and magnesium can be added to the RO or distilled water either as part of separate watering supplements [e.g. using magnesium sulfate (Epsom Salt) for magnesium and greenhouse grade calcium nitrate for calcium] or by adding some ordinary tap water (about 10%) to the pure water. There are some urea-free or low-urea fertilizers available that contain all the macro- and micro-elements needed, including calcium and magnesium. These fertilizers include but are not limited to Dyna-Gro (various formulations), Miracle-Gro, EXCEL Cal Mag (15-5-15, 2% nitrogen from urea), and Bloomfield Orchids Premium Orchid Fertilizer (10-7-15).

Notable Phrag. *besseae* Hybrids.

No article on Phrag. *besseae* would be complete without mentioning something about its use in producing some truly outstanding Phragmipedium hybrids. Hybrids formed using this species are fairly compact-growing plants that usually will have somewhat predictable flower characteristics. The Peruvian variety of *besseae* generally imparts rich color, good form, and broad petal characteristics to the hybrid. The *dalessandroi* form gives its hybrids more flowers on free branching inflorescences. Hybrids produced thus far from the yellow form of Phrag. *besseae* generally have produced light colored representations of the hybrids made with the red forms. However, flowers of hybrids made with the yellow form can have color variations, and some of these can be quite outstanding. This certainly will be a very active area in future hybridization.

Some of the important Phrag. *besseae* hybrids have been reviewed recently [10]; a brief description of the flowers of a few notable Phrag. *besseae* hybrids is presented below.

1. Phrag. Hanne Popow (*besseae x schlimii)*, 1991. Since Phrag. *besseae* belongs to the same section (micropetalum) of Phragmipediums as Phrag. *schlimii*, it is not too surprising that these two species were used to make the first registered

hybrid containing Phrag. *besseae*. As expected, it produces a relatively small flower in shades of near white to dark pink with some bicolor pinks.

2. Phrag. Eric Young (*besseae x longifolium*), 1991. This is an early hybrid created at the Eric Young Orchid Foundation (EYOF) that has an exceptional free flowering habit. The color of the flowers varies somewhat having tones of orange, coral, and salmon. A single inflorescence can have seven or more blooms and plants can be in flower for several months.

3. Phrag. Ruby Slippers (*caudatum* x *besseae*), 1992. Phrag. Ruby Slippers was the first registered long-petaled *besseae* hybrid. It produces flowers with longish petals with some red, but it tends to lack the desired red trademark of Phrag. *besseae*. This cross has a nearly simultaneous bloom habit, as opposed to sequential, a trait inherited from Phrag. *caudatum*. Other newer crosses [e.g. Phrag. China Dragon (*besseae* x Grande)] produce flowers with similar characteristics but are easier to grow and have better color features.

4. Phrag. Mem. Dick Clements *(sargentianum x besseae)*, 1992. This hybrid was the first to display the dark red color expected of a Phrag. *besseae progeny*. The plants consistently yield large numbers of carmine red flowers on relatively small plants.

5. Phrag. Franz Glanz (*besseae* x *richteri*), 1995. The first flava colored Phrag. *besseae* hybrid, Phrag. Franz Glanz 'Gold and Rubies' flowered in 1998 and was made by crossing Phrag. *besseae* var. *flavum* x *richteri* var. *amazonica*. The flowers of this hybrid have a medium yellow color, with a slight flush of orange around the petal edges and tips. The pouch has light orange vertical stripes and has a band of ruby red spots around the top. Some have bloomed with fiery red splashes in the petals.

6. Phrag. Don Wimber (Eric Young x *besseae*), 1995. This cross produces huge flowers of good form, good substance, of a striking apricot to red-orange color that is enhanced by the flower's sparkling surface texture.

7. Phrag. Jason Fischer (Mem. Dick Clements x *besseae*), 1996. This backcrossing of Phrag. *besseae* onto a *besseae* hybrid has produced what many feel is the best red Phragmipedium cross to date. Phrag. Jason Fischer produces large, well proportioned, brilliant red flowers on a compact plant. It has been described as being a Phrag. *besseae* on steroids!

In the twenty year period since its discovery, Phrag. *besseae* in its original and subsequently discovered forms has proven to be an extremely colorful and unique species to cultivate. Its ability to impart desirable coloration, branching, and petal characteristics to new Phragmipedium hybrids clearly has been demonstrated. Future studies will assuredly lead to other hybrids with outstanding color, size, and vigor. Undoubtedly there will be some surprises.

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The USDA's View of Orchid Imports and CITES

As reported by Marcia Romick.

At the 3rd Slipper Symposium in Kissimmee, Florida, T. Mark Thurmond, presented a cogent view of his experiences as a USDA (United States Department of Agriculture) Plant Inspector with the importation of assorted CITES plants and plant products, including orchids, through the Orlando International Airport. This review included a discussion of the required plant quarantine and CITES documents for incoming or outbound plant materials.

Upon returning to the symposium following a break, there was a group of three people, one in a shirt with an official-looking insignia. "Get out alive," was the sentence fragment I heard while walking by. One of them had to be our speaker. With several people in the audience who had frustrating experiences importing orchids, Mark Thurmond, the USDA Inspector from Orlando could hardly have been looking forward to this.

From the inspectors perspective

Mark began with a review of general plant quarantine and CITES regulations and procedures, as well as the treatment and holding facilities at the USDA's Orlando Plant Inspection Station. Among its new features are digital photography and X-ray systems that enable communication with plant identification specialists in the Washington, D.C. area. This enables the expeditious identification of seeds and plants within two to three hours.

The importation of any orchids into the U. S. requires a minimum of one set of paperwork from both the United States and two from the country of origin. From the United States you need an importation permit from the Department of Agriculture, Animal and Plant Health Inspection Service (APHIS). The basis of the APHIS permit is pest control. If you are a hobbyist, this plant quarantine permit is free. If you are a commercial grower, you need the general (commercial use) permit which is $70. The problem facing an inspector is distinguishing between the hobbyist and the commercial grower – THE ON-SITE INSPECTION OFFICER HAS AUTHORITY TO DECIDE in cases that are not clear. As he explained, when someone brings in two hundred plants of two species or hybrids, to the inspector it looks like a commercial shipment. In cases where several hobbyists join together to place a large order from a nursery in another country so as to lower their overall costs, an inspector may view the combined order as a commercial shipment.

In addition to the USDA APHIS permit, the country of origin must issue a Phytosanitary Certificate specifying that the plants are pest-free and CITES documentation certifying that the plants are legal under CITES. The CITES documentation must be an original copy and, at a minimum, must list the plants by genus and species, preferably. Flasks must be accompanied by Phytosanitary Certificate indicating the species and be free from pests, although flasks don't need CITES documentation. Usually, the exporting country specifies whether a plant is jungle collected or not; however, THE ON-SITE INSPECTION OFFICER CAN OVERRULE THIS. For those countries that are not signators to CITES, the inspectors may accept in lieu documents such as Phytosanitary Certificates and nursery bills of sales.

Usually the original copies of the Phytosanitary Certificate and the CITES permit are taken by the inspection officer. (Thurmond observed that the inspectors need the original of the CITES document because of the "potential for altercation, no, I mean alteration." This was an understandable Freudian slip considering the mood of several audience members.) While this procedure may change in the future, as a consequence of this procedure the importer often has no paperwork to prove that their plants are legal.

The new Paphs discovered recently in the North Viet Nam/ China border area present a special problem because Viet Nam does not issue CITES paperwork. Therefore, they cannot legally be imported. (Reported, there will be an article in the AOS *Orchids* magazine dealing with this situation.)

Thurmond recommends that anyone importing orchids find out in advance what is necessary to satisfy the USDA plant inspection officers. Talk to the inspector who will be processing your plants, tell them what you plan to do and ask their advice. They are the experts and THEY HAVE THE ON-SITE DECISION POWER. Remember about catching more flies with honey than vinegar.

He also recommends that hobbyists hire a broker to help their shipments through the APHIS and CITES process and then clearance through customs, which is also required. If the shipment is greater than a certain value, you must hire a broker. You can anticipate that brokers are well acquainted with the inspectors and are familiar with the ins and outs of the procedures. Customarily, the USDA Plant Inspection Offices maintain a list of brokers.

Also, find out well in advance what the country of origin requires. A member of the audience once had to ship a dozen plants home instead of carrying them on the plane as luggage because he didn't know the Australian government closed down over the Christmas holidays. Consequently, he got to find out the hard way all about the various locations of inspection stations, freight office procedures and clearing customs. To this day, he has never totaled up the full cost of those twelve dendrobiums.

In conclusion

Mark Thurmond observed that paperwork and rules may

not be enjoyable but they are the reality. If you import orchids without the necessary paperwork, it is the inspector's job to refuse entry to the shipment. Some inspection stations are reputed to be "difficult." Under the worst circumstances the plants can be returned to the exporting country. However, it is more likely that the plants will be confiscated and either destroyed or sent to one of the Plant Rescue Centers across the country. I wonder if it is possible for hobbyists with enough space to affiliate with the public botanic gardens, arboretums or research institutions as rescue centers to help circulate propagations of these confiscated plants to orchid growers.

One member of the audience asked Mark Thurmond to tell us how to get around the rules. Needless to say, there was no response.

So You Want to Import Exotic Plants? Here's how.....

By Anthony Man-Son-Hing
PPQ Officer (USDA, APHIS, PPQ)

If you want to start your own terrestrial paradise, or simply, to begin an orchid hobby, here are some requirements and import regulations you need to know.

There are three regulations one must adhere to when importing any endangered plant species of orchids. "Endangered species" is defined as any species in danger of extinction throughout all or a significant protion of its range.

The first legislation is the **"Endangered Species Act (ESA),"** which prohibits the trade of importing and exporting endangered and threatened plants. "Threatened species" is defined as any species likely to become an endangered species with the foreseeable future throughout all or a significant portion of its range.

The second regulation, which is a "treaty", is the **Convention on International Trade in Endangered Species,** or CITES. This is a multinational treaty that regulates international trade in wildlife and plants which face extinction. There are ore than 130 signatory countries to this treaty.

The third, the **Plant Pest Act** and the **Plant Quarantine Act,** form the basis for the regulations designed to prevent the introduction of exotic plant pests and diseases into the United States. Specifically, these regulations have two levels - one lists plant genera that are prohibited from being imported into the U. S., and the other restricts the entry of certain plant genera through inspsection, precautionary quarantine treatments, and post-entry quarantine growing requirements.

To comply with these regulations and their specific requirements is simple. The importer needs to get the proper document from the proper authorities.

These regulations are enforced by federal officers of the United States Dept. of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), and Plant Protection and Quarantine (PPQ). The regulations are in place to protect and monitor endangered and threatened plants and to prevent the introduction of insects and diseases which could be harmful to agricultural crops in the U. S.

But what about the plants that are not endangered or threatened (e. g. artifically-propagated orchid plants)? How does one distinguish these plants? The importer needs to get the proper CITES documents from the proper authority. Novice importers should call thier local USDA, APHIS, or PPQ offices or their local plant inspection stations. Currently there are fifteen (15) such stations in the United States. Most of these stations are located at major ports of entry.

As to the proper documents for importing artificially propagated orchids, here is the list:

(a) A **Plant Import Permit** (commonly refered to as a 37-permit), is free of charge and is valid for five (5) years. Call you local USDA, APHIS, or PPQ office and request a PPO FORM 587 (Application for Permit to Import Plants and Plant Products). Or, you can request this form through the 24-hour, 7 days-a-week "fax vault" system operated by these offices. Once you have obtained the application, fill it out and mail it to the USDA, APHIS PPQ, Permit Unit, 4700 River Road, Unit 136, Riverdale, MD 20737. It generally takes about 10 working days to process your permit request. The primary purpose of the agricultural permit is to provide imformation to the potential importer.

(b) A **Phytosanitary Certificate of Inspection** from the country of origin. This document states that the plants are apparently free of harmful plant diseases or plant pests.

(c) **CITES** documents from the country of origin. Both the Phtosanitary Certificate and the CITES documents are required to legally import artificially-propagated orchid plants. Equally important, the importer must have these documents from the approved authorities of the country in which the plants were grown. Again, get the names and addresses of the approved authorities from the local USDA, APHIS, PPQ office.

(d) The last requirement is to provide an invoice and/or a packing list stating how many plants and how many different kinds of plants (genera and species) are in the shipment.

Now,if you are an individual or a company engaged in the business of selling, bartering, collecting, or otherwise exchanging or acquiring the plants as a livelihood for gain or profit, there is one more requirement. You must obtain a valid **General Permit** (there is a fee of $70 for this permit). The permit is valid for two years from the date issued. Application for this permit is available at your local USDA, APHIS, PPQ office, or you can also retrieve an application from the fax vault.

Exemptions?

Yes, there are, if the artificially-propagated orchid plants are imported as tissue cultures and/or flasked seedling cultures. In this case, the shipment is exempted from the CITES document requirement. However, all propagative material will be subject to inspection by PPQ at one of the 15 PPQ Plant Inspection stations at the time of importation. These inspections ensure that the imported plants do not introduce exotic plant pests and diseases which could become serious pests of U. S. agriculture.

Recommendations

Before importing any propagative materials (including artificially-propagated orchids), call you local USDA, APHIS, PPQ office to confirm all necessary documents. Compliance with these requirements will prevent unnecessary delays and reduce the chance of your plants being seized.

What happens if you import artificially-propagated orchids without the CITES documents? Since the United States is a signatory country to the Convention on International Trade in Endangered Species, there is no legal alternative but to seize the plants.

So, follow the rules, import your orchid plants and create and enjoy your own tropical paradise!

Slipper Sales Mart

For Sale: Cribb, *"The Genus Paphiopedilum"* (2nd Ed.) Mint condition. $90. Contact Richard Grundy, 950 Wikiup Dr., Santa Rosa, CA 95403. Email: richardgrundy@att.net

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The Slipper Sales Mart is a small classified section. Ads should be twenty-five words or less (excluding addresses and phone number). Make checks payable in the amount of $10 to The Slipper Orchid Alliance and mail check and text of ad to Janette Harris, 1947 Jackson Rd., Westfield, NC 27053. The SOA assumes no responsibility for any item offered for sale and the tariffs or governmental requirements are the responsibility of the purchaser/seller.

SOA NEWSLETTER
Advertising Rates

1/4 Page (vertical)	$75.00
1/2 Page (vertical or horizontal)	$130.00

Rates apply to ads furnished on computer disk. For details please contact Janette Harris, 1947 Jackson Rd., Westfield, NC 27053. Email: jaharris@surry.net. Make checks payable to The Slipper Orchid Alliance and mail check and text of ad to the above address. The SOA assumes no responsibility for any item offered for sale and the tariffs or governmental requirements are the responsibility of the purchaser/seller.

Support for the SOA

Strong founding member support for the Slipper Orchid Alliance continues. As the Fall 2000 SOA newsletter goes to press, our membership approaaches 170 from six countries: Australia, Canada, Dominican Republic, England, Jersey of the Channel Islands, and the United States.

SOA Commercial Member support also has grown to include fourteen members: Antec Laboratory, Candor, New York; Bloomfield Orchids, Pittsford, New York; Curved Air Orchids, Santa Maria, California; Ellenberger's Orchid Eden, Victor, New York; Fox Valley Orchids, Villa Park, Illinois; Orchidaceae, Seattle, Washington; Orchids Limited, Plymouth, Minnesota; Paphanatics, Ltd., Anaheim, California; Ratcliffe Orchids, LLC, Kissimmee, Florida; The Orchid House, Los Osos, California; Windy Hill Gardens, Labadie, Missouri; and Woodstream Orchids, Huntingtown, MD.

Membership applications may be obtained from "slipperorchidallianace@att.net" or Slipper Orchid Alliance, 950 Wikiup Drive, Santa Rosa, CA 95403-1305. SOA Founders dues through the year 2000 are $25 for individuals and $100 for commercial members.

The SOA's Acting Officers

The SOA's acting officers are: Chairman, Barbara Tisherman, Pittsburgh, Pennsylvania; Executive Director and Treasurer, Richard Grundy, Santa Rosa, California; Secretary, Jamei Haswell, Santa Rosa, California; 1st Vice-president, Gordon Slaymaker, Springfield, Virginia; Newsletter, Janette Harris, Westfield, North Carolina.

The members of The SOA's Steering Committee are: Ed Bayer of Gibsonia, Pennsylvania; Bill Goldner, Huntingtown, Maryland; Steve Drozda of Pittsburgh, Pennsylvania; Jerry Fischer of Plymouth, Minnesota; Norita Hasegawa of Anaheim, California; Doug Kennedy of Vandorf, Ontario, Canada; Tom Kalina of Villa Park, Illinois; Harold Koopowitz of Santa Ana, California; Paul Phillips of Kissimmee, Florida; Kevin Porter of Santa Maria, California; and Bob Wellenstein of Candor, New York.