

Spray all plantings regularly or apply zineb dust (6 percent active) when spraying cannot be carried out.

2. Spray twice weekly after plants are injured by frost or chemicals, or after the disease appears on the plants.

3. After the disease appears, spray or dust the spikes after each heavy rain in addition to the regular two sprayings each week. Continue spraying once a week after the flowers are cut.

4. When spraying twice weekly, alternate maneb with zineb.

5. If the weather makes it impractical to apply sprays or dusts properly, dip the spike heads for 5 seconds on arrival at packing house in one of the following preparations: a) Puratized Agricultural Spray, one pint per 100 gallons plus two ounces of Triton X-100 wetting agent; b) Vancide "51", one pint per 100 gallons plus two ounces Triton X-100; c) Nabam two quarts plus  $\frac{3}{4}$  pound zinc sulfate and two ounces Triton X-100 mixed in 100 gallons of water according to manufacturer's directions for field spraying.

6. Dig corms in dry weather and cure immediately with artificial heat (85° to 95° F.) for one week if the weather is cold.

7. Dust corms immediately after they are cleaned with 10% captan dust, or dip for 15 minutes in 12 lb. captan 50W (Orthocide) per 100 gal. Before planting, dip the corms in Dowicide B or in N.I. Ceresan solution as recommended for Fusarium control. Use a wetting agent such as Triton X-100 in the dips.

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## SOME NOTES ON PHILODENDRON HYBRIDS

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Philodendrons are among the most popular of foliage plants in the United States at the present time. They belong to a large botanical family commonly called aroids which includes such well known plants as calla lilies and caladiums. Aroids for the most part are tropical plants and Philodendrons are inhabitants of the American tropics. The name Philodendron means 'tree loving' and many of the species are tree-climbers in their native habitat. Well over 200 species have been described and received botanical names. Beginning with the introduction of *Philodendron cordatum* many years ago, the number of species grown in cultivation has increased gradually. A few years ago interest in these tropical plants took

a sudden spurt and now several dozen species are popular in the trade.

Philodendron species present a great variety of forms. In size the leaves of the various kinds vary from a few inches to several feet in length and in shape from simple leaves to those that are variously serrated or intricately cut into complex segments. The habit of the plant may be climbing, rhizomatous or arborescent, that is, self-heading as it is called in the trade. Color variations are present too. Red stems and new growth occur in some kinds while various shades and markings of red and pink are found in the bracts and spathes of these and others.

The propagation of philodendrons may be carried on by vegetative methods for cuttings root readily under favorable conditions. Some species are grown from seeds imported from South America. Under Florida conditions many species that are grown to maturity will

flower here. With proper hand pollination these species produce fertile seeds and some Florida growers propagate their stock in this manner.

The progressive step from self pollination of a species to the crossing of different species followed as a matter of natural curiosity. Since some of these hybrids were improvements in color or form over the parents, the hybrids have been continued. As the progeny of any particular interspecific cross is uniform, a hybrid can be propagated indefinitely by repeating the cross without resorting to vegetative reproduction.

Several of these hybrids are now in the trade under various names. This paper is our effort to record the parentage of some of these hybrids while the facts are known and to establish the origin of the trade names where possible. A few of the characters of parents and hybrids are also included. At present the correct botanical designation of many *philodendron* species is not known. In this discus-

sion the names accepted by the trade will be used.

1. *Philodendron* X Orlando (*P. wendlandii* Schott. X *P. Species No. 2*) This self-header has large lanceolate leaves up to 24 inches long with prominent, rounded ears. The margins are even but wavy. The petioles, as long as the leaves, are rather upright making the whole plant stately, symmetrical and more or less shallow funnel shaped. This hybrid is one of the early crosses made by Mulford Foster of Orlando and named by him for the city of that name, the home of his nursery.

*P. wendlandii* Schott. is a commonly grown species with short, thick petioles and a rosette habit of growth. The leaves, up to 24 inches long, are spatulate, broadest above the middle and even margined.

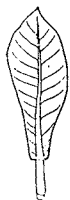
*P. Species No. 2* is unnamed, self-heading and slender in habit. The leaves, rather narrow for their length, are narrowly ovate with well marked ears and an open basal sinus. They are thick in texture and the distinct venation is plainly horizontal.

2. *Philodendron* X Wilsoni (*P. giganteum* Schott X *P. radiatum* Schott) This magnificent hybrid shows the influence of both parents. It is vining in habit but not strongly so. The leaves are broadly ovate, up to 16 inches long and a foot or more in width. The venation is prominent and indented with 3 veins in each ear giving the blade a wavy appearance. The margins are serrated with shallow, rounded lobes at the ends of the veins. The bracts are pinkish green.

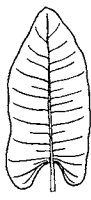
*P. giganteum* is a short stemmed plant with broadly heart-shaped leaves and broad, rounded overlapping ears. The dark green leaves have even margins and a narrow tip. The bracts are slim and green spotted.

*P. radiatum* (perhaps the same as *P. dubium*) is a vining species with deeply cut leaves about 12 inches long. The ears are 3-veined and 3-lobed but not markedly distinct from the remainder of the leaf. All parts of the plant are green.

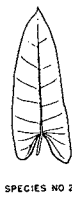
3. *Philodendron* X Mandaianum (*P. erubescens* C. Koch & Aug. X *P. hastatum* Hort.) This colorful hybrid is one of the finest of the vining philodendrons. The dark green leaves up to 14 inches in length, are broadly arrow-shaped with prominent rounded ears. The narrow callous margin is deep red and the leaf



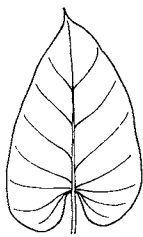
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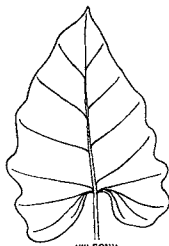
ORLANDO



SPECIES NO 2



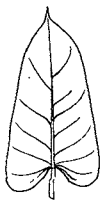
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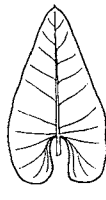
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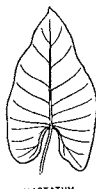
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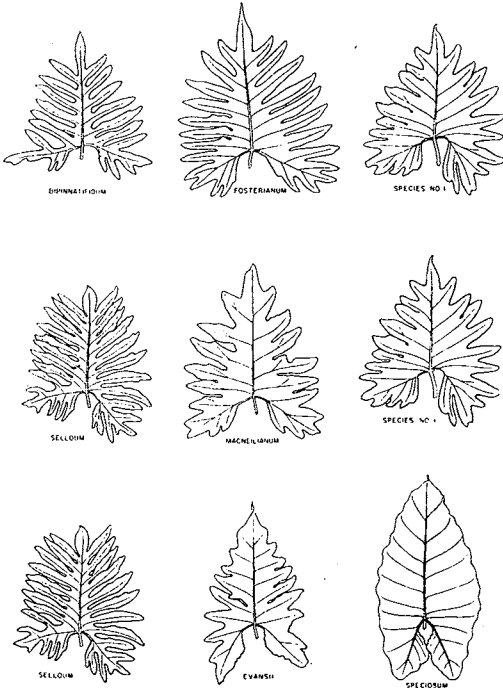
ERUBESCENS



MANDAIANUM



HASTATUM



stalks are purple with a pale waxy bloom. The young foliage is a deep bronzy green, the young stems red and the leaf bracts red outside and white inside. This hybrid originated in the W. A. Manda Nursery in New Jersey. It is one of the oldest hybrids known.

*Philodendron erubescens* is a vining type with dark green broadly lanceolate leaves up to 8 inches in length. The callous leaf-margin, the leaf-stalks and the venation of the younger leaves are all rosy pink in color. The leaf bracts are about 6 inches long, curled at the top and pink in color with dark dots near the base.

*Philodendron hastatum* Hort. is a vining type plant with broadly arrow shaped leaves, 12 inches or more in length. The ears are large and rounded but inconspicuous. The callous leaf-margin is white while the leaf-bract is green outside and white inside with a few dots near the base.

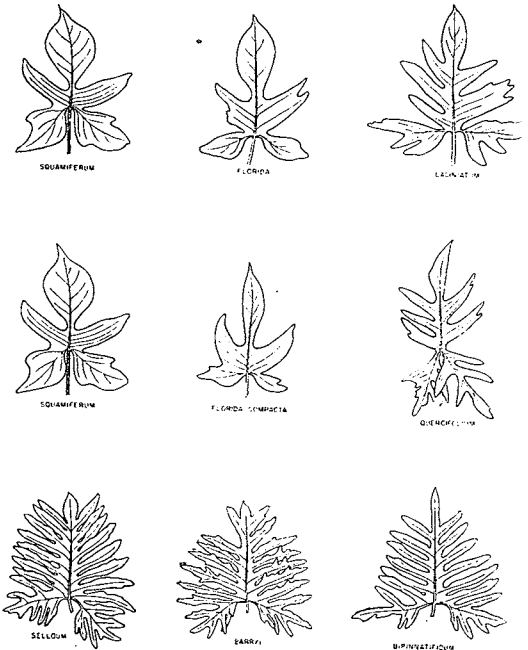
4. *Philodendron* X Florida (*P. squamiferum* Poepp. X *P. laciniatum*) This vining type hybrid is one of the more recent introductions. The dark green leaves up to 10 inches in length lack a distinct callous margin. Each

leaf is deeply cut into a terminal segment, two reflexed prominent ears and two lateral lobes, each more or less cut into lobes. The dark red petioles are minutely scaly and the leaf-bract is green, suffused pink with several dark dots. This hybrid was introduced by Robert McColley, Bamboo Nursery, Orlando, Florida.

*P. squamiferum* is a vining type with very crooked stems. The dark green leaves are divided in 5 distinct lobes including the prominently reflexed ears. The terminal lobe is connected by such a narrow isthmus that it is almost a leaflet. The leaves reach a length of 16 inches and lack a callous margin. The red petioles are densely covered with prominent scales and the leaf-bract, up to 9 inches long, is pale green suffused with pink.

*P. laciniatum* is vining in habit. The deeply segmented leaves up to 9 inches or more in length have very prominent divergent or reflexed ears. The ears are divided into 3 lobes half way to the central vein; the terminal lobe may or may not be divided. All parts of the plant, including the long petioles are green excepting the short blunt leaf-bract which is white.

5. *Philodendron* X Florida Compacta (*P. squamiferum* Poepp. X *P. quercifolium*) This



is another vining type hybrid of recent introduction. In general appearance it resembles Florida very closely, both in form and coloration of the parts. The body of the leaf is less deeply divided and the ears are smaller and less prominent. This hybrid was introduced by Robert McColley of the Bamboo Nursery, Orlando, Florida.

*P. squamiferum* Poepp. is described above.

*P. quercifolium* is a vining species with deeply segmented leaves up to 15 inches long on equally long petioles giving the plant an open, airy appearance. The deflexed ears about 7 inches long are divided into 3 to 5 narrow lobes. The leaves are dark green but the stems and petioles are pale green, the latter with many minute linear striations. The leaf bracts, 7 inches long are pale green and very acute.

6. *Philodendron* X *Barryi* (*P. selloum* C. Koch X *P. bipinnatifidum* Schott) This hybrid belongs to a group of arborescent philodendrons that nearly defy verbal description. This is a robust plant resembling both parents and intermediate between them. It has pinnatifid leaves with the segments as broad as in *P. selloum* but the sinuses narrower than *P. bipinnatifidum*. The segments are sometimes shallowly lobed. The leaf bracts are long, as much as 24 inches, and pale yellowish green.

*P. Selloum* C. Koch is a robust arborescent species with pinnatifid leaves two feet or more in length. The acute sinuses extend two thirds the distance to the midrib and the lobes are often shallowly lobed. The ratio of the 3 terminal lobes apparently varies on individual plants and is not a dependable character. The pale green leaf-bracts may reach 2 feet in length.

*P. bipinnatifidum* Schott is another robust arborescent species with pinnatifid leaves 2 feet or more long. The petioles may reach 3 feet in length giving the species a more open look than *P. Selloum*. The sinuses extend two thirds the distance to the midrib and are blunt or square at the bottom.

7. *Philodendron* X *Fosterianum* (*P. bipinnatifidum* Schott X *P. Species* No. 1) This hybrid is another robust arborescent species with pinnatifid leaves. The blade is cut half way or more to the midrib into narrow straight

flat segments. The sinus is acute, not wide or "square" at the bottom. The large leaf bracts are pale green in color. The leaves are as wide as long and the petioles somewhat longer. This hybrid was made and introduced by Mulford Foster of Orlando many years ago and is one of the early hybrids.

*P. bipinnatifidum* Schott was described above.

*P. Species* No. 1 is an unnamed species of unknown origin. It belongs to the robust arborescent group but has somewhat less pinnatifid leaves. The divisions run one third or more of the distance to the midrib and the margins are less wavy than the others. The leaves are numerous and the head appears dense in spite of the rather long petioles. The long leaf bracts are pale green.

8. *Philodendron* X *MacNeilianum* (*P. Selloum* C. Koch X *P. species* No. 1) This robust arborescent hybrid closely resembles some other kinds such as *Selloum*, *bipinnatifidum* and *Barryi*. The differences are very difficult to put into words. The lobes are long in this hybrid and each lobe bears many small lobes along the margin completely to the bottom of the sinus. (The drawing was made from a juvenile leaf and does not show this characteristic.) The leaves are large and the "frilly" appearance of the leaves gives the plant a very handsome appearance.

*P. Selloum* C. Koch is described above.

*P. Species* No. 1 is described above.

9. *Philodendron* X *Evansii* (*P. Selloum* C. Koch X *P. speciosum* Schott) This is a robust hybrid of unusual appearance. The large elongated sagittate leaves are longer than the petioles so that the tip part of the blade rests on the ground until the plant attains considerable height. The blade and the conspicuous ears are deeply lobed, all of which have wavy margins. The blade proper has an uneven surface, giving the leaves a generally wavy appearance. The attitude of the leaves is nearly vertical so that they always appear "full face." The leaf bracts are said to be red.

*P. Selloum* C. Koch is described above.

*P. speciosum* Schott is a robust arborescent species with entire ovate leaves resembling large elephant ear leaves. The leaves 3 feet or more long with large ears 1 foot long have

wavy margins and a wavy surface but in general are flat. They tend to hang vertically from the tips of the very long petioles. This is a magnificent species requiring adequate space.

As this paper was presented at the meeting of the Society, it was illustrated by koda-

chrome slides. In the proceedings of the Society it is illustrated by outline drawings prepared by Miss Esther Coogle, staff artist for the College of Agriculture. These drawings are drawn approximately the same size without reference to the actual size of the leaves.

## FERTILIZATION OF GLADIOLUS

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Reports from various parts of the country indicate that gladiolus fertilizer requirements vary a great deal with the particular soil and climate encountered. While it is true that other crop plants must also be fertilized according to soil and climate, gladiolus differ from gross feeders such as corn in that maximum flower yield and quality are obtained at a lower level of fertilization and some soils require little or no fertilizer. Still another difference is the sizeable reserve of inorganic and organic nutrients present in large corms. Thus, in soil of good nutrient-supplying capacity one does not see large responses from fertilizer applications. In regions of light, sandy soil such as the Southern Atlantic and Gulf Coastal Plains of the United States, it is necessary to fertilize gladiolus adequately to obtain optimum production of high quality spikes and corms. With light soils and heavy rainfall it is necessary to fertilize frequently in small doses. The response of gladiolus to fertilizer is oftentimes a delayed reaction and many effects will show up the second season due to the superior quality of corms fertilized adequately.

Nutritional requirements of gladiolus vary depending on variety and chemical composition and size of corms or cormels. Some varieties such as Morning Kiss and Spotlight respond more to fertilizer than others such as Rosa Van Lima and Elizabeth the Queen. Large corms require less fertilizer than cormels and smaller corms due partly to the stored reserve and partly to greater feeding capacity of the extensive root system produced by large corms.

Any condition that damages the root system seriously will increase the need for fertilizer

due to an impairment in the uptake from the soil unless, of course, there is a luxury supply of nutrients in the soil. When roots are damaged there is need for placement of fertilizer nearer the plant, more frequent irrigation, and the use of foliar nutritional sprays. Factors likely to cause root damage include mechanical pruning in cultivation, nematode and fungus attack, water-logging of soil and chemical damage such as salt injury.

The following section is devoted to a brief consideration of certain nutrient elements, discussed singly. Reference to nutrient requirements in terms of the amount to be found in plant tissues should be regarded as approximate since the amounts required will vary somewhat depending on nutritional balance and environmental factors.

### NITROGEN

This element is the one most likely to produce yield responses in gladiolus. Analysis of leaf samples fertilized in various ways indicates that the leaves should contain on a dry weight basis 2.5 to 3.0 percent nitrogen or more for optimum yield. The effects of nitrogen deficiency include a reduction in the number of florets per spike and number of spikes per corm together with the customary pale green coloration of foliage found in nitrogen deficiencies. Also, the utilization of old corm food reserves is hampered by lack of nitrogen. There is ample evidence that excess nitrogen accelerates Fusarium corm rot and, in order to use high nitrogen levels to obtain good yields it is necessary to have good preventive measures for the control of Fusarium corm rot. Nitrogen is an element required in somewhat greater amounts by small corms and cormels than by large corms.

The form in which nitrogen is supplied is important. Flower quality is better when nitro-