

Amaryllis

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Anyone who knows me knows what my favorite flower is the amaryllis. Growing up in Baton Rouge, my adjacent neighbor bought new Dutch hybrids annually, hybridized them, and had hundreds in his yard. I remember the year my younger brother and his

friends, playing swashbucklers, decapitated the scapes before they had a chance to open. Talk about "hell breaking loose!"

At LSU, the pomology professor for whom I worked as an undergraduate (Gary Couvillon's major professor at the time), was really a floriculturist. Amaryllis occupied about a third of his "fruit" greenhouse. His enthusiasm for amaryllis further stimulated my interest. He was a great teacher in and out of the classroom. Years later, he followed his heart and switched (officially) to floriculture.

Except for when I was in the Army, I've always managed to carry a few amaryllis bulbs along with me. I have a couple of hundred in my yard some cultivars but mostly crosses I've made.

So, I've found it exciting to see the popularity of the amaryllis increase over the past decade. I remember when American Express first began offering them for Christmas. Now, amaryllis are even becoming popular for Mother's Day and Easter. In fact, they're so common now that one simply has to go to the produce section of his local super market to purchase one. One SC greenhouse operation uses the amaryllis for its logo.

Although they're not cheap, in our area they will perform well outside (even producing offshoots) year after year, unlike the undependable tulip. Undeveloped scapes occasionally are sold wholesale as cut

flowers, the retail value of one scape being roughly equal to that of a large bulb!

In the U.S., the name "amaryllis" generically refers to commercially important bulbs, even though the bulbs marketed in the trade are derived mainly from plants of the genus *Hippeastrum*. (meaning: "horse star" in Greek), now the accepted genus of the hybrids that we grow commercially. Some, however, still use the genus name *Amaryllis* for the Dutch hybrids. "Amaryllis" is the common name, *Hippeastrum* the botanical name. *Amaryllis* is the generic name for *A. Belladonna*; but, *crinum* is no longer *A. bulbisperma*, it's *Crinum bulbispermum*; *lycoris* is no longer *A. radiata*, it's *Lycoris radiata*, etc. The *Hippeastrum* species name is listed in England as *hybrida*, but here it's *vittatum*.. Many people simply give the cultivar name (e.g., *Hippeastrum* 'Bouquet').

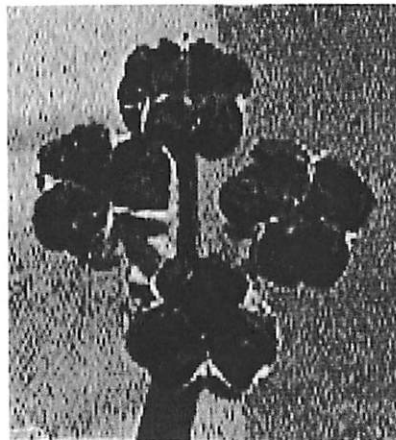


Fig. 1. *Hippeastrum* capsules with seed - ready for sowing

In the lower South, it is common to see outside large clumps of amaryllis bulbs, their flowers trumpet shaped, looking much in shape like an Easter lily flower. Their color is red with a white stripe or white with a red stripe. These are the "Mead strains," developed in Florida by Dr. Theodore Mead. Their parentage includes bulbs imported from England and the continent by Dr. Henry Nehrling. Outside, these bulbs often grow in large clumps which add a lot of color to the landscape. Although the Mead types come true from seed, they are not as striking as the Dutch hybrids: their color range is very limited, and their flower form is considered inferior to the Dutch hybrids. The petal/sepals of the Dutch hybrids are far wider and more reflexed than the Mead types, making their flower wider in diameter and flatter than the Mead types.

The Dutch hybrids come in many colors and various combinations and tints and shades of them: white, red, pink, orange, and, just recently, yellow. Some of the rose pinks exhibit a blue tint in their petals. A yellow species (*H. Evansiae*) was discovered in Bolivia about 35 years ago. It is a relatively small bulb (ca. 1 1/2 inch

35 years ago. It is a relatively small bulb (ca. 1 1/2 inch in diameter, maximum) with flower of only an inch in diameter. It's taken quite a while to incorporate the yellow into the larger flowering yellows available commercially.

The flowers are produced (2-6) in an umbel arrangement [i.e., stems (pedicels) of florets attached at same point on main axis (peduncle)] on the scape (i.e., a leafless, hollow stalk that originates at ground level). The scape's rapidity of development is truly amazing... from being just visible at the bulb's nose to as much as 3 feet long in a few weeks! Individual flowers of 11 inches in diameter may open. In some cultivars, the leaves emerge from the bulb with the scape, but in others, leaf emergence from the bulb follows flowering. Often, more than one scape, usually 2, will develop and flower simultaneously. Regardless, another scape usually develops 2 to 3 weeks after the first floral display. Each flower may develop into a fruit (capsule) which may contain over 100 seeds. Seeds are a good place to begin discussing amaryllis culture.

The capsule, after turning yellowish, will begin to split about 6 weeks after the flower opens, revealing its black seeds (Fig. 1). At this stage, the highest percent germination will be attained... the longer one keeps the seeds after this point, the fewer will germinate. Seeds not planted right away should be kept in the refrigerator until sowing. Seeds removed from the capsule may be floated overnight in a bowl of water before sowing. They may be sown thickly (i.e., seeds touching one another) about a quarter of an inch deep in builder's sand. In less than two weeks, the surface of the sand will be covered with small leaf blades. Continue to water them. The sand insures good drainage, so they won't rot. A tiny bulblet is evident with the formation of the second or third leaf. After a month, a complete liquid fertilizer of about 200 ppm N is recommended, which may be increased to 500 ppm N at 4 months. After 6 months, 700 to 800 ppm N is

recommended! They grow like weeds!

The bulblets will probably need transplanting at the 3-5 month stage, again at 10 months, when you can introduce each bulb to its own pot.

When transplanting, use a mixture (by vol.) of three parts builder's sand, four parts pine bark (soil conditioning grade), and two parts peat moss. The pH should be adjusted with dolomitic limestone to ca. 6.5. NEVER fertilize an amaryllis bulb that has no leaves. Amaryllis will flower from seed in 3 years, occasionally in two years... if greenhouse grown!

Amaryllis should be potted with ca. one-third to one-half of the bulb above the growing medium surface. They do well when potted this way, and it keeps the bulb's nose dry, precluding conditions conducive to "red blotch" infection. Potted bulbs thrive under conditions in which they are pot bound. When potting a mature bulb, leave only an inch

between the outside of the bulb and the inside of the pot rim. In outside beds, the bulb should be planted with only half of the bulb's nose above ground. Heavy mulching in the fall/winter is advised.

The life cycle of the amaryllis is extremely interesting. Seedlings do go through a juvenile stage, noted by the fact that they continue to grow relatively vigorously in the greenhouse in winter. The juvenile stage probably ends with the initiation of the first scape within the bulb. In winter in the greenhouse, mature amaryllis have a "tendency" to have a rest period [i.e., a period in which visible growth completely ceases because of internal (physiological) conditions within the plant]. Their growth slows greatly in winter, but it does not cease completely. In the greenhouse, if left alone, mature bulbs generally flower in the spring, but many also flower sporadically at other times of the year.

The mature amaryllis bulb initiates flowers while growing vegetatively. Initiation of a flowering scape within the bulb is not photoperiodically controlled. Research has shown, however, that

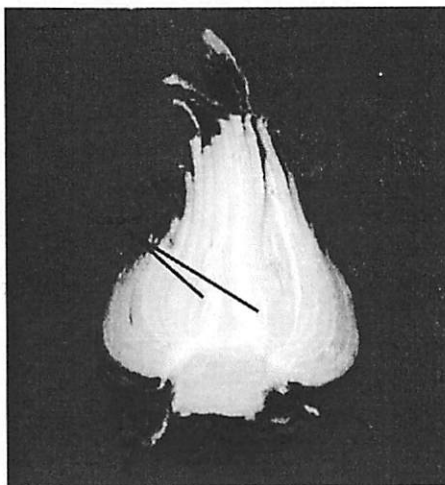


Fig. 2. Scapes within *Hippeastrum* bulb that has been cut in half in mid winter.



Fig. 3. *Hippeastrum* flower exhibiting ripe anthers

very warm temperatures (e.g., >83°F days, >73°F nights) increase leaf growth but reduce bulb growth and the number of scapes initiated. These conditions are common in summer in the deep South. In general, a bulb will initiate a flowering scape following the production of 3 to 4 leaves. It follows, then, that the more leaves it produces, the more scapes it initiates. A mature bulb will average about 12 leaves during a growing season, producing about 3, and on rare occasions 4, scapes. If outside, growth ceases in the fall as temperatures decline, and the leaves die back. The winter is really a dormant period (i.e., it ceases growth because the temperatures are unfavorable). This forced period of inactive growth induces scape development (i.e., expand, take up water, etc.), and by early spring the scape(s) will be visible at the nose of the bulb, usually developing before the leaves, which do not appear until the temperature warms up more. The winter period of inactivity "programs" the scapes to develop in the spring. In the greenhouse, these same scapes might flower in late winter or not develop until summer.

The interesting part of their life cycle is that the scapes that develop in the spring (i.e., emerge through the neck of the bulb, elongate, and flower) are the ones that were initiated about 18 months previous, not the ones initiated the just-previous growing season! In other words, when it finishes flowering in the spring, the scapes initiated the last growing season are still within the bulb and won't develop until the next spring. At the end of the growing season in the fall, the bulb has within it scapes of two ages... those initiated last year and those initiated the current year (Fig. 2).

In the greenhouse, one can program flowering. This is accomplished by withholding water from the plants in August and turning the pots on their sides to make

certain that no water gets into the pots. The leaves should not be cut off. They should be allowed to die naturally. In December, the scapes will appear at the nose of the bulb. To force them at that time, the pots are turned uprightly and the bulbs watered. Bulbs will

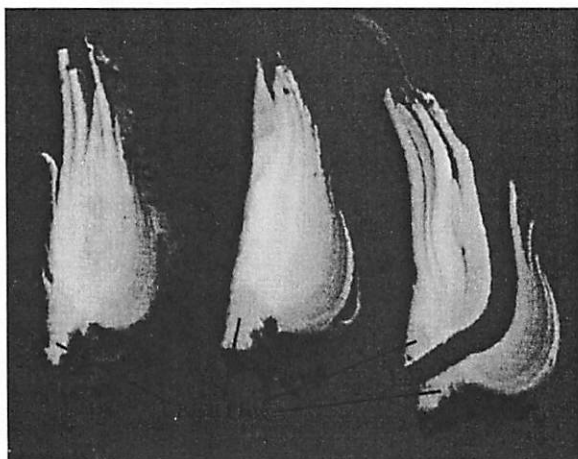


Fig. 4. Hippeastrum bulbs cut longitudinally 1/8, 1/16 and 1/32. All pieces contain a portion of the basal plate.

flower in 4 to 6 weeks in a 62 to 65°F minimum greenhouse. They should not be fertilized until their leaves begin vigorous expansion. For later flowering, they can be stored at 40-45°F. This 40-45°F exposure is not a necessary part of the plant's life cycle (i.e., it does not fulfill some rest requirement because it doesn't have a rest requirement). This temperature range merely acts as an unfavorable environment for vegetative growth and scape development. It is simply a holding temperature, and bulbs can be held for at

least a year at this temperature before forcing. About 4 to 6 weeks before flowering is desired, the bulbs should be removed from the 40-45°F storage and watered. If they're potted during the 40-45°F storage,

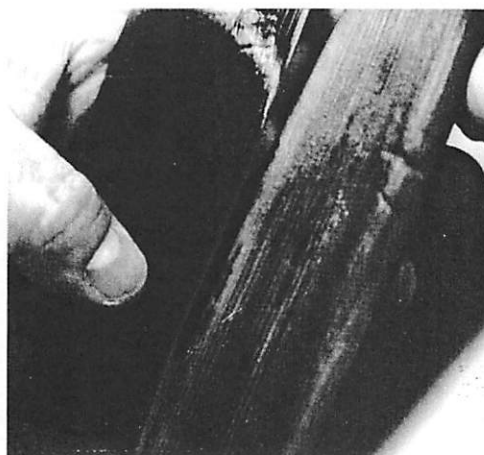


Fig. 5. Hippeastrum leaf blades infected with mosaic virus. Healthy-left, Infected-right.

the bulbs must be watered occasionally. Bulbs already rooted when removed from storage will force faster and produce larger flowers than bulbs which must root during scape development. It is possible, therefore, to force amaryllis at any time of the year.

Amaryllis are extremely easy to pollinate. Once the pollen is on the stigma (Fig. 3), the flower will begin to streak and wilt within a day or so. Most of the seedlings produced will have striped flowers, even if both parents have solid colored flowers. Also, many of the

seedlings will not have the open, flat form of their "parents" they'll be more trumpet shaped. It is possible, however, to get seedlings equal to and occasionally better than their parent(s). In a yard, what matters is color (i.e., the mass effect), not the quality of an individual flower.

Amaryllis do produce offshoots, some cultivars more readily than others. Any offshoot, of course, would be identical to its parent. Because propagators want to sell as many bulbs as possible, they prefer that cultivars not produce offshoots readily, and this is a consideration in whether a cultivar is released commercially. Offshoots initiate their first scape at ca. the 9-leaf stage, but often this first scape aborts.

Amaryllis may also be propagated by cuttings (i.e., bulb dissection). Only large bulbs should be used in asexual propagation. First, the bulb is cut longitudinally (top to bottom) through its basal plate. After dividing a bulb in half, the halves are halved again (total: 4 pieces), then again... 8, and then 16. It is possible to continue to 32 (Fig. 4), etc., but it is recommended that nonprofessionals stop with 16 divisions. Each cut piece must contain a piece of the basal plate (stem tissue) or it will not root because new roots develop from stem, not leaf, tissue. The bottom third of the cutting, which includes the basal plate, is buried in sand and watered. In several weeks, a new leaf will appear, then two, etc., then a new bulb will form at the base. This bulb will flower in ca. two years. Asexual propagation like this is how named cultivars are increased.

The main pest problems of amaryllis are mosaic virus and "red blotch". Occasionally, plants in the greenhouse will get soft brown scale, but this is easily controlled. Spider mite infestation is rare, but it too is easily controlled.

There is simply nothing one can do to eliminate mosaic from a plant. Its symptom is light yellow streaking of the foliage. Often, new leaves do not manifest the symptom until they have elongated and matured. Initially, a plant with mosaic may perform well, but it will have reduced vegetative growth as the years progress. Eventually, it will not flower. Also, it serves as a source of infection of healthy plants. The mosaic virus can be spread by insects, also by cutting an infected plant with a knife, then cutting a healthy one with the same knife. There is some evidence that smoking tobacco in a greenhouse can produce mosaic infection. Some believe that the virus can be transmitted from root to root in a bed situation. Plants infected with mosaic do not transmit disease to their

seeds. So, if the plant produces a nice flower, one might make a few crosses with it before discarding it.

"Red blotch" is caused by the fungus *Stagonospora curtisii* (Fig. 5). It is very destructive and, if unchecked, progresses rapidly within a bulb and from bulb to bulb. This same disease is called "scorch" on daffodils. The disease manifests itself by reddish brown spots that develop into lesions on the bulb, leaves, and/or scape. The fungus can progress into the heart of the bulb. The scape may rot off at the attacked location before its flowers open. Even today, it is unfortunately common for bulbs to be infected with both mosaic and red blotch when they are purchased.

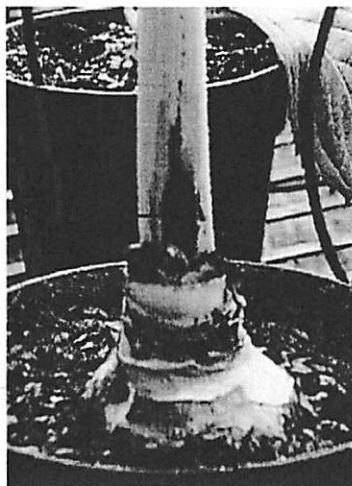


Fig. 6. Scapes of *Hippeastrum* infected at bulb nose with red blotch. (*Stagonospora curtisii*)

Captan and Bordeaux mixture used to be recommended for red blotch, but neither is very effective. Then Benlate came along. It was extremely effective in eradicating *Stagonospora* from amaryllis. If properly timed, one spray in early fall could eliminate the disease from a moderately infected plant. Because the fungicide is systemic, the plant probably draws the fungicide into the bulb when it translocates its leaf carbohydrates into its bulb as its leaves

wither and die. It is a good idea to assume that newly purchased bulbs have the disease: soak them in a Benlate-like fungicide for a half an hour before planting. Cleary's 3336 and Sierra's Domain may substitute for Benlate.

Selected Cultivars

There are many amaryllis cultivars available. Some of the older cultivars produce offshoots more readily than some of the more recently released ones.

'Apple Blossom': a white flushed pink; the American favorite; an older cultivar with strong substance and ideal flower form.

'Bouquet': an salmon orange with strong substance; flower form is a bit triangular, caused by its petals reflexing too much; its color is its best attribute.

'Fantasy': looks very much like 'Apple Blossom' but with a lot more and deeper color; doesn't have the substance of 'Apple Blossom'.

'White Giant': aptly named; one of the largest flowers but also with one of the longest scapes; a vigorous grower.

'Marie Goretti': a white with frilled edges; flowers have good substance and form but not many flowers per scape.

'Doris Lillian': a deep rose pink... a favorite; good substance and flower form; open flowers have a blue tint in their petals; can be hard to find.

'Wyndham Hayward': a dark red of extremely good substance and flower form; this clear red color hard to find.

'Majuba': a scarlet with exceptional flower form (very wide petals/sepals which do not reflex) but tall.

'Trixie': a cherry red; very good substance and flower form; color is unique.

'Picotee Petticoat': white with red lined petals/sepals; substance and form are an improvement over 'Picotee' but they are still only a little better than average.

'Red Lion': medium, clear red with very good substance

'Yellow Pioneer': new color with only average flower form.

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