

## PROPAGATION AND CULTURE OF CYCLAMEN SPECIES

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I am concerned about the precarious position of cyclamen in the wild. I also find them fascinating plants to grow and study—each plant is different, even within a single species.

There are no cyclamen species indigenous to North America. They occur around the Mediterranean basin, throughout southern and central Europe, western Asia, and north Africa; however, they are easily naturalized in many parts of this country.

As I gradually began to build a collection of almost all of the 19 species of cyclamen, I was frustrated to find that most of them were not available in this country. I ordered tubers from every source I could locate and was extremely disappointed to discover that most of what I received were wild collected plants and fewer than half of them grew. I then discovered that they were on Appendix II of the Endangered Species List which means that they are considered plants in peril, and that a CITES permit is required for exporting or importing them. In 1976, 256,000 tubers were exported from Turkey, and in 1979, 1,099,725 were exported. By 1985, the number had increased to 6,632,000, according to Christopher Grey-Wilson in his excellent book, *The Genus Cyclamen*. Turkey then agreed to limit their exports to 1,000,000 per year. In 1988 the Natural Resources Defense Council reported that one U.S. dealer imported 86,000 tubers directly from Turkey, and the Netherlands imported 1,600,000. The majority of the tubers imported into this country are funneled through Holland and many come in with spurious names, such as "*Anemone coum*". Except for a few distinctly shaped tubers, it is extremely difficult to identify cyclamen species when they are in a dried state, and it is just about as difficult to bring them back into growth. It is illegal to sell collected tubers of the species *mirabile*, *repandum*, *trochopteranthum*, *pseudibericum* and *parviflorum* from Turkey, and Greece has banned the exporting of *C. graecum*, *creticum*, *balearicum*, and *persicum*.

Cyclamen are members of the Primulaceae family; their cousins are dodecatheons and primulas. What the members of this family have in common are five stamens, one style and a persistent calyx. The plants grow from tubers—not bulbs or corms. The tubers may have roots all over them as in the case of *C. purpurascens*, only from the bottom as with *C. graecum*, or they may come from the top of the tuber, as with *C. hederifolium*. Although they are classified as dicots, only one seedling leaf is usually present; the second one is repressed and appears only if something happens to the first one.

They are very easily cultivated as long as you give them some shade and excellent drainage. In general they grow best near the top of the soil, with the exception of *C. repandum* which needs deep planting. *Cyclamen graecum* and *C. cilicium* both grow and bloom best with some sun. Drainage can be improved by the addition of small pebbles worked into the soil or by making a raised bed incorporating gravel, which will also discourage rodents. My only serious problem is a curious racoon that overturns a thousand or more pots almost every night; this becomes a disaster when the plants have been sorted by color; they have stopped blooming, and the racoon is especially vigorous in tossing the pots about.

I have not been successful in propagating these plants except by seeds, but in working with them have discovered a number of common approaches as well as some important differences. One of the most important requirements for a high germination percentage is fresh seed. When the seed capsule is ripe, the coil which has brought it down to the top of the tuber relaxes and a tiny opening appears in the pod. It is important to collect the seeds at this point or slightly before, for the ubiquitous ants are ready to clean out the pod and carry away every seed within the hour. This is an excellent aid for the dispersal of seeds, but a nuisance when I am trying to collect seeds for nursery propagation. The rarer seeds are planted immediately in small pots with two or three seeds per pot. The seeds in abundant supply are sown spacing them about  $\frac{3}{8}$  in. apart in small flats and are then covered by about  $\frac{1}{4}$  in. of grit or potting soil, and set in a dark place. Total darkness greatly increases the germination percentage. The effect of temperature on different species is extremely important. In general each species requires the same modulations of temperatures that it would receive in its native land. The species *graecum*, *persicum*, *intaminatum*, and *purpurascens* require summer heat for seed germination, while *C. balearicum*, *repandum*, and *parviflorum* seed will germinate only after a considerable cool period. All of the others require heat and then falling temperatures to stimulate germination.

I will give a brief summary of many of the species with their individual requirements, presenting them in the order in which they bloom for me in central North Carolina. Sporadically throughout the summer, but primarily from late August into November, *C. hederifolium* produces its lovely flowers in shades of pink or white. The appearance of the beautiful and extraordinarily variable leaves signals an end of the flowering period. Also at this time *C. africanum*, one of the most dramatic species, blooms with flowers and leaves similar to but larger than those of *C. hederifolium*. It is difficult to distinguish between these two species unless a chromosome count is done; however, the leaves of this one rise directly from the tuber rather than at an angle as with *C. hederifolium*. In every way *C. africanum* is larger than *C. hederifolium*. The easiest way to

determine whether you have the real thing is to leave it outside during the winter. If it dies when the temperature goes below 20°F, then you know you had *C. africanum*.

Overlapping the blooming period of these species is *C. graecum* with flowers that are similar, but different in that they have streaks of a darker mauve color on the corolla lobes. The interior of the mouth of the corolla is dark, the anthers are purple, and the velvety heartshaped leaves appear with the flowers.

The fourth species to come into flower during late summer is *C. rohlfsianum*, a beautiful, rare and tender plant from Libya. The resemblance to dodecatheon is striking when you notice the exertion of the stigma and anthers in a cone beyond the mouth of the corolla lobes of the flowers, many of which are fragrant. This is one of the few species which requires complete drying off during the summer. Water is withheld from the time the leaves begin to yellow in May until sometime in July when a good soaking will bring them back into growth.

Often during the summer in the greenhouse, *C. intaminatum*, the miniature of the genus begins to produce its beautiful white or palest pink flowers. It has quite rounded leaves, which are green or green with patterns of silver dots around the edge. Some forms even have beautifully variegated leaves. This is hardy with us and grows well in a scree pot in shade or in the garden given a well-drained site.

*Cyclamen cilicium* bridges the gap between the fall flowering and winter flowering species. I was delighted to see them blooming in the Chicago Botanic Garden last December. The leaves, which are spoon-shaped, are produced at the same time as the flowers, which may be anything from deep mauve through pale pink to pure white without any color at the base of the corolla. I finally have seeds from such an albino, but have yet to see it bloom. This is a remarkably hardy species, but is relatively short-lived and is more susceptible than most to death from too much moisture. It needs to be high and dry during the summer.

*Cyclamen mirabile*, the species which led to the protection of many cyclamen, blooms also at this time. In many ways it is most similar to *C. cilicium*; however there are important distinctions. The petal tips are fimbriated in *C. mirabile*, while they are entire in *C. cilicium*. Often, but not always, the new leaves have a rosy overcast on the part of the leaf which will be silver at maturity. I have also noticed a pinching in at the base of the corolla lobes.

Beginning sometime in October and blooming well into December is *C. cyprium*, a tender species, with wonderfully fragrant white flowers with a distinctive "bird-in-flight" mauve marking and often beautifully variegated leaves.

In December the main winter flowering species begin to make a show which will last into March. *Cyclamen coum*, with all of its

diversity of leaf shapes and flower colors is the best of the winter species and the easiest to grow. It is generally agreed that there are two distinct subspecies of *C. coum*. *Cyclamen coum* subsp. *caucasicum*, occurs in the Caucasus and has larger flowers and heart-shaped leaves. *Cyclamen coum* subsp. *coum* occurs in the West and has more rounded leaves and smaller flowers. There are wonderful forms with completely silvered leaves (pewter leaf), or with only a tiny bit of green (silver leaf), with many degrees of variegation, and even a green leaf one. The flowers may vary from pure white, through pink to magenta.

*Cyclamen libanoticum* from Lebanon also blooms in winter with lovely, relatively-large flowers of an unusual shade of pink. The beautiful leaves are dull pewter-green sometimes with bright white markings. Hardiness is being tested this winter in central North Carolina.

*Cyclamen persicum* is the species from which the florists' cyclamen was developed. It is a tender, fragrant, elegant plant which can stand only 26°F. Breeders worked for years to develop larger flowers with brighter colors and in so doing lost much of the fragrance which is present in the wild plant. Now they are working to make them smaller and to recapture its natural fragrance. I think it is hard to improve on the wild form.

*Cyclamen trochopteranthum* is a delightful, hardy species which has leaves reminiscent of *C. cilicium* and fragrant flowers similar to those of *C. coum*. The difference is that the petals are not completely reflexed and stand out from the flower like propellers.

The diminutive *C. parviflorum* has been described as not garden worthy; however, I disagree. It is like a small version of *C. coum* but is wonderfully fragrant. The flowers are produced on short stems, so it is one which is best viewed on hands and knees, in a pot on a greenhouse bench, or on a hillside.

*Cyclamen pseudibericum* is considered by many to be the most spectacular species in the genus. There are many forms, and certainly the one with large purple flowers and well marked leaves cannot be beat. It is extremely hardy, surviving -12°F in North Carolina and can bloom anytime from November through March.

In spring we look forward to three more species to cheer our souls on cold, gray days. *Cyclamen balearicum* has proven hardy in U.S.D.A. Zone 7. It has white, fragrant flowers, often with pink veins and beautiful gray leaves often overlaid with silver.

*Cyclamen repandum* is a wonderful, fragrant, spring flowering plant, which has elongated and twisted petals of a medium shade of pink. This is the only species that requires full shade and deep planting. It is remarkably hardy and survives the winters possibly because it has the ability to wait to surface until the worst of the winter weather has passed. There are two additional forms of *C. repandum* worth growing. *Cyclamen repandum* var. *rhodense* has

white flowers with a darker pink area at the base of the corolla, and leaves heavily speckled with white. *Cyclamen repandum* var. *peloponnese* has similar splashes of white on the leaves, but flowers which are pink or even a deep magenta-pink. These two varieties of *C. repandum* as well as the pure white form are not hardy.

The beautiful, white-flowered *C. creticum* is one of the rarest of all of the cyclamen. It produces its leaves in the fall, but blooms only in mid-spring. To my surprise it has proven hardy, coming through the Eastern U.S. terrible winter of 1986.

The hardiest species of all is *C. purpurascens*, which blooms throughout the summer and fall and is hardy in Minnesota. It has the shortest dormancy requirement producing new leaves just as the old ones fade in late spring. The fragrant flowers are various shades of rose, and the leaves may be solid green or with varying degrees of variegation; some are even completely silvered. There has been some confusion over the status of a form with solid green leaves from the Fatrense mountains of Czechoslovakia, but botanists agree that there is no basis for giving it either separate species status or a varietal name. The 19th species, *C. somalense*, was discovered in 1986, and I have not yet seen it.

I urge you to get to know this group of plants by growing them from seed yourself or by purchasing nursery propagated, rather than wild-collected specimens.

## **PROPAGATING AND GROWING CRABAPPLES BY BUDDING**

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### INTRODUCTION

One thing I have learned in the nursery industry is that there is seldom only one correct way to perform a nursery task. As sure as you think you have perfected a method, someone else will come along with a new technique, an improved product, or a totally different way of thinking that produces equal or even better results.

When I returned in 1978 to the family homestead and business of which I had been a part for 10 years as a school boy, I soon attended my first series of nursery seminars and meetings. At one of them I was amazed to see a friendly but heated debate between two nationally respected propagators on the subject of rooting cuttings. One fought tooth-and-nail for the practice of "wounding the cutting within an inch of its' life"; and the other was equally adamant about not wounding. Both men were highly respected experts in the field.