

Breeding *Clivia*®

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BACKGROUND

The first things needed in the fundamentals of plant breeding, in my opinion, is to have a passion for what you are doing and an enjoyment of working with the particular plant group you have chosen. Secondly, know your topic. Have some knowledge of the where, how, and why the plants you have chosen grow where and the way they do. Once you have a background to your topic you will need some mature stocks that are flowering. This is the time to go hard and try anything, have an idea of what you think you want to achieve but try all combinations and see what results occur from a little experimenting. The final product may be amazing or a complete failure, but whatever happens at least you will have given it a go.

CLIVIA SPECIES

The genus *Clivia* is a relatively small group in the plant kingdom, consisting of six species from Southern Africa. Most grow in the east of Southern Africa from Port Elizabeth up to Mozambique. Only one species and the last to be discovered, *C. mirabilis*, is from the north western part of South Africa near Namaqualand.

Clivia nobilis

First registered in 1828, it is a coastal species and can be found in semi shade of coastal scrub and forest in dunes of acid loamy soils from sea level to 600 m.

Clivia gardenia

First registered in 1856, this species is found in deep coastal and inland forest in shale or sandstone soils from sea level to 1200 m above sea level (a.s.l.).

Clivia miniata

First registered 1864, it is the most commonly grown and most varied. It can be found in a range of forest types and is the only species found in four of the other species zones from sea level to just above 1500 m a.s.l.

Clivia caulescens

First registered in 1943, it can be found in forests in the sun and shade and quite distinct from most because of its large rhizome and epiphyte habit.

Clivia mirabilis

First registered in 2002, it can be found in high sandstone mountain areas of Nieuwoudtville and Vanrhynsdorp 850-900 m a.s.l. in shade or sun growing like xerophytic aloes.

Clivia robusta

Although this species was not the last found it was the last registered in 2004. This species was thought to be just a very large form of *C. gardenia* but does grow in quite different conditions, found in grassland and remnant forest normally restricted to swampy terrain from sea level up to 500 m a.s.l.



Fig. 1. This image shows a flower cluster from *Clivia miniata*.

BREEDING CLIVIA

Now that we have a little history, where the plants grow, and the types of habitat and soil, we can get into the breeding. Breeding of *Clivia* is like any other type of breeding, it requires male and female parts, in this case the pollen or male part from the anther and a receptive stigma female part. Once we are ready with all the necessary material pollination can begin. The following types of crosses that can be performed over time are:

Self Cross

This is when pollen is used from the same plant as it is to pollinate, the result will be like its parent if it is not already a hybrid.

Intraspecific Cross

This is a cross between the same species but different father/pollen parent and mother/seed parent, the resulting progeny may vary depending on colour of flower, leaf, or plant size etc.

Interspecific Cross

This is a cross between different species and can result in a multitude of different outcomes depending on what has been used.

Backcross

This is a cross from a seedling back on one or other parent, this will normally result in many of the seedlings looking like the parent that has been used.

F₁ Hybrid Cross

This is the first cross between two plants of the same or different species normally producing a very similar sibling seedling.

F₂ Hybrid Cross

This is the next cross on from the F₁ hybrid and can produce some amazing progeny, normally very mixed up.

The following are group names given to artificial interspecific hybrids:

Group Name	Parentage
<i>Clivia</i> Caulgard Group	<i>C. gardenii</i> × <i>C. caulescens</i>
<i>Clivia</i> Cyrtanthiflora Group	<i>C. nobilis</i> × <i>C. miniata</i>
<i>Clivia</i> Minicyrt Group	<i>C. Cyrtanthiflora</i> Group × <i>C. miniata</i>
<i>Clivia</i> Minigard Group	<i>C. gardenii</i> × <i>C. miniata</i>
<i>Clivia</i> Minilescent Group	<i>C. miniata</i> × <i>C. caulescens</i>
<i>Clivia</i> Mirabiliscent Group	<i>C. mirabilis</i> × <i>C. miniata</i>
<i>Clivia</i> Nobilescent Group	<i>C. nobilis</i> × <i>C. caulescens</i>
<i>Clivia</i> Noble Guard Group	<i>C. gardenii</i> × <i>C. nobilis</i>
<i>Clivia</i> Noblemir Group	<i>C. mirabilis</i> × <i>C. nobilis</i>
<i>Clivia</i> Robmini Group	<i>C. robusta</i> × <i>C. miniata</i>

With so few species you would think very little can be achieved in hybridizing the various groups but this is not so, as I have found out the results are as varied as the combinations. The fact that all the species have at least two flower colour variants and *C. miniata* with at least five colour breaks means you already have more than twice as many hybrids that can be achieved. Then there are leaf forms and shapes and this is a whole different game that the Asian breeders have been doing since the late 1800s.

Clivia selections with short or variegated leaves are very much the desired result with many named groups/strains arising such as Daruma, Monks, Akebono, and Light of Buddha just to name a few. More for an indoor market, these are also very prized and presented as gifts. In Europe the Belgians have been breeding for the pot culture and probably produce more *Clivia* than any other country. These are grown to flower in 3 years from seed and have a very tulip-shaped flower.

The Africans, Americans, New Zealanders, and Australians have bred more for the garden and gone for a wide colour range in a range of flower types. Colours such as orange, scarlet, apricot, peach, pinks, yellows, whites, greens, bi-colours, green throats, and picotees, and shapes from the formal *C. miniata* type and pendulous or drooping flower types.

The breeding work I have been doing in more recent years is to see if I can breed a range of plants suitable for cooler and more sunlight conditions, and with a good colour range and medium leaves more suited to the smaller garden. Most hybrids can take anywhere from 4 to 5 years before a flower is seen, so I look forward to every new flowering. The reason for using the various species in our breeding programme is to extend flowering over the year as many of the hybrids will flower out of the normal flowering times of the species.

