

## Propagation Experiences With New Winter Flowering *Gladiolus* Cultivars

**Angus Stewart**

52 Narara Creek Road, NARARA NSW 2250

Think of *Gladiolus* and most people immediately mention the incomparable Dame Edna Everage. Unfortunately the great Dame seems to have given "gladdies" something of an unfashionable image, although I can't imagine why. A comprehensive breeding programme by Mr. Fred Meyer of Escondido, California is set to change the image of *Gladiolus* once and for all.

The traditional horticultural *Gladiolus* are summer-flowering types with characteristic monster-sized blooms. These types tend to dominate our perception of "gladdies", but unfortunately they do not do justice to the extraordinary diversity and beauty of this large genus. There are some 250 species of *Gladiolus* found throughout Africa (including tropical areas) and the Mediterranean region. Of these only a small handful are represented in the commercially available *Gladiolus* cultivars. Species that have rarely if ever been used in breeding feature delectable perfumes (e.g. *G. caryophyllaceus*), orchid-like flowers (e.g., *G. orchidiflorus*), ornate markings, and multiple colours on the one flower. In addition, many of the species flower in late winter and spring — thus complementing the summer-flowering types from a grower's point of view.

The basic objective of Fred Meyer's breeding programme has been to incorporate the features of the more unusual and desirable species with the traditional summer flowering tetraploid cultivars that have dominated the scene for so long. This paper looks at some of the experience gained in the breeding and propagating of this unique group of hybrids.

The first problem to be overcome in the breeding programme was the fact that the parents of most of the hybrids flowered at different times. As most of the wild species used are winter- or spring-flowering, while the other parents were tetraploid summer-flowering types. Pollen storage was the obvious answer and to do this whole anthers were collected just before anthesis and were placed in gelatine capsules (obtainable from some chemists). The capsules were then placed in jars with moisture-absorbing silica gel and then stored in a freezer for up to 6 months. When the summer-flowering female parents were flowering the pollen was thawed out and applied to them.

Initial selections were made about 5 years ago from many thousands of hybrid seedlings. Cormlets from the initial selections were used to initiate tissue cultures to bulk up promising clones for trial work. Tissue culture has also been a great benefit for transporting the material to different countries. In addition the varieties were also indexed for viruses and keeping clean mother stock in culture means that virus free stock can always be maintained. *Gladiolus* are very responsive to standard tissue culture media and the techniques have been well documented in the past. The multiplication rate of different hybrids varies enormously with some clones being extremely prolific.

Hardening off tissue culture material can be done in a couple of different ways. Firstly, actively growing shoots without significant corm development are planted

out and can be grown to flowering size in one season. Secondly, by elevating the amount of sugar in the medium, cultures can be induced to form corms in vitro thus making planting out less risky. Both techniques are very successful.

The next phase involves growing the plants through to flower. Once corms reach flowering size they produce cormlets at their base and these can be used for further multiplication. The growing seasons of the new hybrids has proven interesting. The fact that they are hybrids between winter and summer growers has meant that some selections have the ability to grow virtually year round. Other selections, on the other hand, have been better suited to either winter or summer but not both. There are obvious advantages to growers with the year-round types.

This project represents a very interesting breeding experiment in that it has incorporated germplasm from an extensive collection of wild diploid species with tried and trusted tetraploid cultivars. The result is a new range of triploid cultivars which gives them a series of useful characteristics. They are sterile and therefore will not set seed, meaning that they are highly unlikely to ever escape from cultivation. Triploids also tend to be easier to grow than tetraploids in that they are not quite so big and brittle. The flowers of the new cultivars are generally intermediate in size, something that makes them instantly distinguishable from the tetraploid cultivars.

In summary, the Fred Meyer *Gladiolus* hybrids represent a fascinating collection of new cultivars that have a diversity and charm that is far more representative of the whole genus. We can look forward to an array that features perfume and orchid-like flowers.