CLIVIA BREEDING

Peter Haeusler and Ken Russell

We were most fortunate in having Ken Russell travel all the way from Dungog in New South Wales to talk at our June meeting on Clivia breeding.

Ken spoke about the importance of both taking a long-term perspective with one's Clivia breeding plans and the need to be rigorous in the selection of breeding stock. He pointed to the efforts and great success of his friend and mentor, Bill Morris, the world-renowned Clivia breeder. Bill is well known for his fine yellows, although it is 'Tango (a Picotee orange with huge yellow throat) for which he is probably best known. It took Bill 40 years to develop his yellows, and of course today when you buy seed from world-renowned breeders like Sean Chubb you will see the legacy of Bill's work continuing in their breeding programs.

Bill started off with a 'poor natural yellow' obtained from the late Mick Dower in South Africa which he crossed with a 'nice orange. It took five generations to perfect what Bill was prepared to term a 'good yellow'. This involved germinating 5000-10,000 seed each year, and then as these plants reached maturity and flowered selecting only the very best to cross back, at least initially to the orange parent. Gradually the percentage of yellows increased (such that today when crossing Group 1 yellows we can be pretty sure of getting 100% yellows...although with the extent to which genetics are now being mixed, we can get quite unanticipated outcomes). Most importantly, the quality of the yellows increased progressively, and over time it increased substantially of course.

As an aside here, those of you who receive the *Clivia News* may have read the article in the latest issue (Vol.22, Number 2) by Allan Tait (attached at the conclusion of this article) and his experiences with developing a particular hybrid between *Clivia miniata* 'Coromandel' and *Clivia robusta.* Alan talks about putting down 1000 seeds in 2005 but when they flowered, he ended up retaining less than 20 plants (i.e. less than 2%) which exhibited the desired characteristics. Interestingly, those that flowered at say 3 years compared with those that flowered for the first time only at 5 years tended to display different characteristics (more of one parent than the other), a further consideration it would seem when crossing species.

'Best Kept Secret' - plant and photo courtesy of Yvonne Hargreaves

Ken has continued to build on Bill's work with the yellows, especially the latter's line producing the highly regarded 'Best Kept Secret', and in turn from it 'Skychase'. Ken stressed the importance of knowing your parent plants and indeed their lineages to get some idea of what you may get — otherwise crossing and mixing strains is simply a lucky dip! This, he said, is even more the case today with the mixing of different species. While certainly producing some amazing results, we are also seeing extremely varied results in terms of plant form, as well flower form and colour, even over large numbers of seedlings. In Australia the problems and challenges are greater because of the poor early record-keeping relating to breeding efforts and the many discrepancies in these. This extends to the *Cyrtanthiflora* (sometimes referred to as the Aussie nobilis), the origins and genetic make-up of which remain unclear.

Ken suggested that DNA testing may help increase our knowledge and make for better breeding programs, but he also reminded us in the meantime of Mick Dower's aphorism, ' I rely on someone else to tell me the truth '.

Throughout his talk Ken emphasised the wealth of variation — and uncertainty — that we will all encounter when it comes to breeding clivias. In some respects, this is part of the fun and fascination of course, but if you are seeking particular ends then it may be a source of frustration, even confusion. Ken emphasised the importance of finding out what you can about your parent plants and trying to work out what it is that you want to achieve with a given cross. Also, remembering Bill Morris' experience, don't be too ambitious about what you are likely to achieve in one generation! You might only get 10 suitable plants out of every 100. But take the best and cross it back to the parent, or cross siblings. And in next generation, depending on the outcomes, undertake the same process. Furthermore, if you are crossing, say, different spedes such as a *Clivia miniata* and a *Clivia robusta* then you should think about crossing these both ways, that is, using the *miniata* as the pod parent with the *robusta* as pollen parent, but also undertaking the reverse cross. Outcomes can vary depending on which is used as the pod and pollen parent. You need to be alert to this and explore the possible effects and outcomes to get the most out of the plants that you are working with.

What you are trying to do is not only produce particular outcomes, and hopefully exciting ones at that, but you also want to work on refining your strain, achieving consistency in those outcomes. It is all well-and-good to produce some exciting new variation, but the challenge is to reproduce this and indeed to refine it. This is where you put like to like and seek to do so over generations.

Of course, clivias, like people, are not simply a product of their genes. Environmental factors such as lighting, growing medium, and fertilising regime all affect plant development, flower formation and flower colour. Ken emphasised the importance of glucose when it comes to plants growing in artificial mediums such as pine bark. Honey or molasses are being used by many growers with good results. Ken recommends molasses (which can be obtained from produce stores where it is sold for adding to the diet of livestock) at the rate of 2.5-5.0 ml/litre and applied monthly as a foliar spray.

In terms of growing medium, Ken emphasised the crucial importance of maintaining a relatively open, aerated mix. He is not an advocate of using coconut fibre (coir) in a mix as it breaks down too readily and

can lead to a mix becoming sodden, leading in turn to root rot and the onset of disease. Perlite added to a mix improves aeration, while wood chips (hardwood, redgum) and stone chips are also very useful from this perspective. Pine bark is probably the most widely used element in mixes, but care needs to be taken with PH levels, especially when using fertilisers with high nitrogen levels, to ensure mixes do not become too acidic. Dolomite or calcium carbonate can be employed to good effect to counter this potential problem.

Ken stressed the importance of a good growing medium combined with a balanced and consistent fertilising regime. The aim is to ensure that seedlings get off to a strong start; quick early development is vital to plant health. Again, he came back to the value of molasses in this regard, noting at the same time that he had also found molasses to be 'very effective' in controlling mealy bugs.

Allan Tait's article from *Clivia News* follows this page.

Clivia miniata 'Coromandel' X Clivia robusta