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Our Breeding of Endemic Southern African Plants

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Summary

The development of a successful plant breeding program targeting South African native plants is described. *Aloe* was the major plant improved for ornamental use but additional genera including *Agapanthus* have also been highly successful.

INTRODUCTION

My journey started in 1973. As a teenager I found a passion for aloes, and whilst studying Botany at university I realised that the different species sometimes naturally hybridised in the wild. I thought that if I did the selection of the parents myself, I could do a better job.

Our rich diversity of amazing Southern African plants has always been improved in the Northern Hemisphere, generally rendering them less suitable for our warm sunny climate. I decided to change that, as it's OUR proud heritage and we can do better because we know and have access to the broader gene pool.

Starting with nothing, it was a long, tedious road, but today I have a breeding company called De Wet Plant Breeders which is based at The ALOE FARM and CND Nursery in South Africa (**Fig. 1**). De Wet Plant Breeders aims to improve mainly Southern African ornamental plants that are heat and drought resistant. I also have an extremely capable junior partner, Quinton Bean, and our cultivars have received numerous awards worldwide - undoubtedly the best known is the prestigious 'Plant of the year 2023' at the Chelsea International Flower Show in the UK.

Figure 1. Andy at The ALOE FARM, in one of the display gardens filled with De Wet cultivars.

Ornamental plant breeding is a slow, expensive process which starts with studying a potential genus and then growing and collecting suitable specimens to work with. After a few years of tedious hand pollination, you may achieve some success (and lots of failure!), but you could end up with a gene pool that can serve as basis to build your breeding upon. It is important to keep a record of your hybrids so that you know the hidden characteristics of each seedling. Even if you select the best parents, you never know exactly what you're going to get. All the progenies differ slightly from each other, and the recessive and dominant characteristics are at first generally unknown to you. Successful plant breeding is a scientific numbers game (**Fig. 2**).

We currently work on approximately 22 different selected genera. With only *Agapanthus*, we do an average of 12,000 seedlings annually from selected, hand pollinated parents (**Fig. 3**). They are then grown in the best possible conditions in order to bring them to flower as soon as possible, so that we can evaluate and select the best and then discard the majority to create space for the next batch. We destroy the rejects because we have to protect our genetics, selling them would give the opposition shortcuts into our expensive work.

Figure 2. Colourful drought and heat-resistant gardens filled with De Wet aloe cultivars.

Figure 3. New hybrid *Agapanthus* seedlings, grown from selected hand pollinated parents, each pot containing a different combination. This is typical of one season's work and the parentage of each combination is kept on tags that will always stay with the plants.

Plant breeding is fascinating work, because we continuously raise seedlings and each one harbours promise of great expectations.

The real fun begins when they start flowering! This is when we get lots of surprises, and then there are often individual plants which exceed expectations or open up new avenues to follow. Quinton and I do all the selections ourselves. On first flowers we normally pick a soft selection, which is the "best" 3-4%. Mistakes are unavoidable, but this is where our experience and instinct matter. These selected few then get tested further, usually potted up and left to flower again when they are more mature plants. The selection is very strict and the final product must fit several criteria.

There is no such thing as a perfect plant and a good plant breeder is never satisfied - that is what keeps us going! The search for the proverbial "holy grail" is never ending. One can only release a plant to the horticultural community if it is distinctly better and different to anything that came before it. On the level at which we are breeding today, it very often happens that a plant can have only one really outstanding characteristic, but it's not good enough if it isn't balanced out with overall excellence. Our massive compost heaps are littered with plants that have some amazingly unique characteristics.

A new cultivar must satisfy the consumer, people are always wanting something new and better, that is the nature of mankind….and womankind! But most importantly, we breed for the growers, like the distinguished members of IPPS. We have only succeeded when we supply the market with a new release that has outstanding new features, is easy to grow, flowers in record time and is disease and heat resistant. Most importantly, it must appeal to the retailers and consumers. A perfect example of this is *Agapanthus* 'Blackjack' - apart from fitting the above criteria, its uniqueness has created a buzz worldwide (**Figs. 4 to 7**).

Figure 4. *Agapanthus* 'Blackjack' winner of the prestigious “Plant of the Year 2023” at the Chelsea International Flower Show in the UK.

Figure 5. De Wet Plant Breeders, Quinton Bean and Andy de Wet, celebrating the Chelsea win.

Figure 6. Some mature *Agapanthus* from our diverse trailing section. It is often very difficult to select which one to release.

Figure 7. *Agapanthus* 'Fireworks', won a third at The Chelsea International Flower Show, popular for its distinctive drooping bicolor flowers and being extremely floriferous.

De Wet Plant Breeders try to release as few cultivars as possible, in order to create memorable plants and not to confuse the industry and public with meaningless multitudes. There is no room for sentiment in plant breeding, but sometimes during the selection process, we stumble on plants that may not fit the commercial requirements but are just too good to destroy. This happens especially with aloes. Fortunately, we have The ALOE FARM with ever-expanding gardens that are continuously fed with the best new and unique aloe plants in the world! Visitors from many countries and all over South Africa visit us annually during our winter Aloe Festival season.

Plant breeding works very much like the music and film industry, we create a unique product that becomes patented as our intellectual property. We only start getting a return for our efforts when our products are sold in the stores and royalties are calculated and shared with our agent. That is why the protection of our intellectual property is paramount to the success of our endeavours.

We generally do not sell directly to retailers, but regularly send clean samples for testing and reproduction purposes to trusted associates. We are represented by Plantipp, who are excellent agents worldwide and communicate, distribute, and monitor the wholesalers who grow our plants under license. It sounds extremely lucrative, but once we've identified a new release it takes 7-8 years before the supply

chain is satisfied and saturated to the point where the plant starts selling in the stores. Plant breeders must have deep pockets, or as in our case, stay poor and patient for a long time. I have been told this is not a good business plan …. but it's a lot of fun and we're establishing a lasting legacy.

The goals in our breeding are varied and not always profit orientated. One important goal is conservation - by making hybrids of popular but endangered species like *Aloe peglerae* (and several others), we have created similar looking hybrids that grow and flower better. The aim here is to alleviate the illegal collection pressure on the natural plant population.

Figure 8. A new cultivar should surpass all previous similar plants in its overall appearance. To be a good cultivar, many characteristics like vigour, diseases and heat resistance, are also essential.

Often there are unusual, attractive characteristics in an obscure species that need to be enhanced, e.g. from *Aloe perrierii* we created *Aloe* 'Marilyn'. Alternatively, there is the easy growing and architectural *Aloe* 'Samson' - it's a practical lookalike of the extremely difficult and very slow growing but popular Aloe dichotoma.

Another target is the landscape industry. Plants like *Aloe* 'Hedgehog' and *Aloe* 'Peri Peri' (and several others) have proved to fulfil that need. It is however difficult to get landscape architects and garden designers to change their habits.

Mostly, however, we breed to satisfy the nursery industry with ornamental plants that will become available in local retail stores.

The practicality of use is also very important in a cultivar. The size and neatness must make handling, packing and transportation as easy and cost effective as possible, without any damage to the plants.

An important aspect which we always keep in mind during the breeding and selection process, is the environmental impact of our creations. A successful new plant must be tough in many situations - easy to grow and resistant to most plant diseases, but also add to the surrounding environment by attracting and feeding beneficial insects and birds. Fortunately, it's sometimes an automatic thing - when a cultivar flowers more prolifically and for longer periods, it will also generate more nectar and pollen for our fellow creatures. The ALOE FARM is very popular with nature lovers, and we also have a very active Facebook group, BIRDS OF THE ALOE FARM.

Our Southern African flora has the potential to take an even bigger place in world gardens, but it has to be improved by enhancing the colours, number of flowers produced and lengthening the flowering season. Good examples of this are *Agapanthus* 'Buccaneer', *Aloe* 'Rocket', and *Aloe* 'Starstruck', and a plant like the smaller *Aloe* 'Goldfish' will flower randomly throughout the year.

Finding the correct name for new cultivars is very important as a bad name can sink a good plant. A name like Blackjack is perfect as it's short, strong, descriptive and easy to remember. Two of my favourite aloes are named Charles and Sannie after my parents, and as a tribute to our family's love for them, there is one of each planted on their grave….and they flower beautifully every winter.

Our international *Agapanthus* cultivar distribution was kickstarted by *Agapanthus* 'Twister' which was widely accepted worldwide. We have set the new benchmark for the genus *Agapanthus* because our cultivars have much more attractive flowers and longer flowering seasons than traditional agapanthus. Good examples of this are *Agapanthus* 'Poppin' Purple', 'Bingo White' (Syn. 'Ever White'), 'Buccaneer' (Syn. 'Poppin' Star'), and many other award-winning varieties. We also have a breeding programme for cut flower *Agapanthus*.

Some breeding programmes have come to a dead end, like *Albuca* that seemed to have such promise at first. The negative characteristics just wouldn't go away, so we dropped our *Albuca* breeding programme after ten years of dedicated work. A fantastic, improved *Plumbago* which we created is just too slow growing to ever put out to the market.

However, we have many beautiful *Gazania*, *Osteospermum*, *Dietes*, *Plectranthus*, *Salvia*, day lilies, *Bulbine*, *Kalanchoe*, *Arctotis*, *Tecomaria*, *Cotyledon*, *Coleus* and many other exciting hybrids that we have either released or have them slowly moving through our extensive secret pipeline (**Fig. 9**).

Figure 9. *Gazania* 'Suncarpet', a new De Wet *Gazania* cultivar, unique large flowers on short, neat stems. It's a improvement as it's heat and drought tolerant, sterile. Being self-cleaning, keeps the plants looking fresh, which means it reduces the amount of labour involved by growers and retailers.