



# SHAPED BY SUFFERING

The Eastern Cape has produced some of the most enduring and successful garden plants in the world.

by Ernst van Jaarsveld, Kirstenbosch

Gardens originated in the Northern Hemisphere when humans started cultivating plants that provided nourishment, medicines, clothing and building material. Gradually gardening for aesthetic appeal emerged and today gardening is the most popular hobby worldwide. There are no fixed rules, people grow what they like and enjoy, and gardeners are always ready for a new challenge. But in general it is the plants from abusive backgrounds that have become the most enduring and popular garden plants.

## Disturbing practices

Gardening is very disturbing to plants. Disturbances include the cultivation of soil, planting, transplanting, pruning and trimming, adding compost and fertilizers, creating ponds, paths and other structures, breaking these down, and cutting and disturbing roots. Invasive plants from neighbouring territories have to be regularly weeded out, necessitating a regular disturbance of the soil. The very act of cultivating the soil benefits the emergence of pioneer plants - usually known to us as weeds. (New gardening techniques

using mulches have helped somewhat.) Other disturbances come from the activities of dogs and cats, and domestic animals as well as trampling from humans, especially from children.

To survive in a garden, plants have to be 'garden-fit'. Many plants (for example, fynbos species like ericas, proteas and buchus) have a

very sensitive root system which does not like any disturbance, as they originate in areas where they did not have to adapt to trampling or grazing disturbances. Some plants however, grow easily in any garden, and are able to tolerate human handling, neglect and ill treatment better than others. 'Garden-fit' plants that spring to mind are spekboom (*Portulacaria afra*), *Pelargonium*, hen-and-chickens (*Chlorophytum comosum*), kerkei (*Crassula portulacacea*), kransaalwyn (*Aloe arborescens*), and *Plumbago*. The secret of their success is their ability to tolerate disturbances, which naturally would be grazing or trampling animals, droughts, frost or poor soil. This ability equips them to withstand the rigours of growing in a garden. So if you blame yourself for the death of your erica, relax, it died for other reasons.



Above. The marsh rose *Orothamnus zeyheri*, admired by all but not suitable for the garden. Top. The thicket vegetation of the Eastern Cape, cradle of the world's most popular 'garden-fit' plants. Photos: E. Van Jaarsveld.

## Garden-fit plants from the Eastern Cape

In my series of articles\* on 'veld gardening' (now consolidated into a book, *Wonderful waterwise gardening*), I emphasized how to garden effectively with



indigenous plants adapted to a specific ecological region in South Africa. Obviously, a plant would prefer to grow in its own region, but there are some indigenous plants that thrive in gardens throughout the world. If a plant thrives in gardens within its ecological region I call it 'locally garden-fit', and if it thrives in each area, I give it a good 'overall garden-fitness' score. Most plants with a high 'overall garden-fitness' score originate in the Eastern Cape, which can be conferred with the title of 'Cradle of the world's most adaptable garden plants'. Plants from this region have had a major horticultural impact on the world. On the annual Dutch garden and floral market at Alsemeer, plants are rated according to their sales (reflecting their popularity) and many South African plants are high up on the scale. *Pelargonium* cultivars have been rated for many years as the tops, and colourful pelargoniums grace the balconies of buildings and gardens in cities throughout northern hemisphere. Other popular houseplants from South African include the spider plant or hen-and-chickens *Chlorophytum comosum*, forest lily *Clivia miniata* and many of our herbaceous, succulent and bulbous plants.

Plants from the Eastern Cape are easy to grow, adaptable, hybridize easily and can take rough handling. They are remarkably **tolerant of disturbance**, having evolved side by side with grazing animals. In their habitat, grazing and trampling is a major driving force (just as fire is the driving force for adaptations in fynbos, grassland and bushveld). In the fertile soils of the Eastern Cape, many plant species are highly nutritious and in great demand for grazing. This thicket vegetation used to carry dense populations of larger and smaller mammals (including domesticated animals). Evolutionary responses to grazing pressure resulted in thorns, bitter sap (a chemical defence) or camouflage!

Some plants even exploit this abuse. Many rely on disturbance in order to vegetatively reproduce. The spekboom (*Portulacaria afra*) sacrifices its branches to grazing mammals, but when the branches are dropped they re-root quickly, forming new plants. *Gasteria* and *Adromischus* leaves are brittle and readily detach when grazed or touched, but the leaves or fragments that fall rapidly re-sprout, often in the protective arms of thorny plants



The world's most popular garden plant, the pelargonium, graces the streets of Europe. It originated in the Eastern Cape. Photo: E. Van Jaarsveld.

such as *Carissa haematocarpa* where only smaller grazers (the leopard tortoise, dassies, bushpigs or porcupines) can reach them. Pregnant onions (*Ornithogalum longibracteatum*) and the cliff fire lily (*Cyrtanthus montanus*) have loose bulblets that re-sprout after disturbance. Leopard tortoises are very fond of *Ornithogalum*, *Crassula* and *Adromischus*. The hen-and-chickens, *Chlorophytum comosum*, forms plantlets on a long inflorescence, that rapidly root and form dense mats. *Plectranthus madagascariensis* and *P. verticillatus* are also mat-forming and re-root rapidly after being trampled. Mother-in-law's tongue, *Sansevieria aethiopica* has fibrous leathery leaves that are browsed by rhinos. The stem and subterranean stolons are brittle, allowing the leaves break off easily, leaving the stolons behind to re-sprout. (*Gasteria* and *Adromischus* in contrast have brittle leaves that are adapted to browsing by tortoises.) Have you tried to uproot a *Sansevieria* by pulling it?

The plant breaks off but the stolons remain behind. *Sansevieria* leaf fragments will rapidly root when left in the ground and form plantlets. They are one of our most adaptable garden plants.

Most of these plants have a degree of succulence so that if they become detached from the mother plant, they can survive on stored water and food. That is why they transplant so easily and grow so happily when thrown on the rubbish heap! I have seen cycad stems dumped on a rubbish heap starting to re-sprout after a few years. *Aloe arborescens*, *A. ferox*, *A. africana*, and many other aloes can be chopped up and thrown in a corner and will even start flowering and put out new roots a year later, in spite of lying sideways. Similarly, the spekboom (*Portulacaria afra*), thicket spursage (*Plectranthus madagascariensis*), ivy-leaved pelargonium (*Pelargonium peltatum*), red pelargonium (*P. inquinans*) and the zonal pelargonium (*P. zonale*) make good,





Left. Pregnant onions, *Ornithogalum longibracteatum*, have brittle bulblets along the stem. When grazed by tortoises, bulblets fall to the ground and grow. Above. A leaf fragment of the ox tongue, *Gasteria*, that fell to the ground has rooted and formed many plantlets – one of the ways in which a plant exploits abuse and grazing.

Opposite page, above left. Haworthias are popular tortoise food. *Haworthia cymbiformis* is stoloniferous and simply re-sprouts if grazed by the leopard tortoise. Below left. A young leopard tortoise, *Testudo pardalis*. Right. Rhinos graze the mother-in-law's tongue, *Sansevieria aethiopica*. The leaves are firm and fibrous, but brittle at the base of the plant, so they break off at ground level, leaving the subterranean stolons behind. Photos: E. Van Jaarsveld.

‘A botanical garden in this region is a must!’

easy to grow garden subjects. My collecting experience from the Eastern Cape corroborates this. Plants collected were just placed in paper packets without any nursing, and after a few days brought back and potted: all of them perfectly surviving my abuse.

Rainfall in the Eastern Cape is unpredictable and can occur at any time of the year. Long droughts and flooding are fairly common occurrences. The plants are **tolerant of drought but can cope with too much water**: conditions that often occur in our garden where plants are often under- or over-watered. These Eastern Cape plants can take it! (The Eastern Cape succulents are the only non-local succulents that thrive at Kirstenbosch. They are planted in the eastern flank of the conservatory exposed to the full blast of winter rainfall and yet they grow, flower and reproduce!)

The Eastern Cape is situated along the margin of the subtropics and its plants are **tolerant of low winter temperatures as well as extreme heat**: a range of 7-40 °C. That is why pelargoniums are easily grown in Europe, and also in hot dry climates. In contrast, ‘Aarons rod’ or wonder plant *Tinospora fragosa* of the bushveld is a great survivor of disturbance, but heat and summer rainfall are critical for its survival. Another example is the

baobab (*Adansonia digitata*).

Many garden-fit plants are relatively **tolerant of insect pests**. Have you ever seen a spekboom or mother-in-law's tongue (*Sansevieria*) being eaten by caterpillars, aphids or grasshoppers? I have grown various forms of spekboom for years and they are the most insect-free of all succulent plants! They offer themselves to larger animals but deter insect grazers. *Agapanthus*, hen-and-chickens, *Ledebouria socialis* and *Plectranthus madagascariensis* might have the odd specialist pest, but on the whole, they are insect-free, a quality that makes them ideal for the garden.

Some plants only perform in sunshine, others only in shade. Many Eastern Cape plants are **tolerant of sun and shade**. When elephant grazing removes their shade-cover they have to suddenly get used to a high light intensity until the branches grow back and provide shade again. This is the reason why *Agapanthus* can tolerate shade. It flowers best in sun but can be grown in shade as well. Many *Plectranthus* will also tolerate full sun although they prefer shade.

The Eastern Cape is the only region in South Africa where most of the biomes and vegetation regions merge - afro-temperate forest, Nama Karoo, fynbos, grassland, thicket, savannah and fragments of

succulent Karoo. The only vegetation unique to the region is the thicket biome. You often find a curious plant combination - a *Euphorbia* next to a *Podocarpus falcatus*, or a tufted mesemb like the rare endemic *Orthopterum coegana* next to an epiphytic orchid like *Polystachya pubescens*. There is a great range of soils, and plants are **tolerant of a wide soil range**, from the very fertile valleys where the thickets occur to the mineral-poor quartzitic sandstone soil regions. Consequently, they can grow in gardens with differing soil-types.

Lastly, Eastern Cape plants are **tolerant of competition**, as they are able to grow in dense plant communities, sharing their habitat with many other plants.

#### Why fynbos plants are not garden-fit

We all admire the marsh rose *Orothamnus* and if it was easy to cultivate we would all have it in our garden! Why does an *Erica* die if we just walk around it or cultivate the soil below it? Again the reason lies within their native habitat. Just as the fertile soils of the Eastern Cape and all the factors discussed above have produced plants with high overall garden fitness, the mineral poor soils of the fynbos produced plants with a low food value that did not attract grazing mammals. Instead, fynbos plants have become





adapted to frequent fires, and this is the reason they make poor garden subjects. However, fynbos plants from lowland, strandveld and riverine regions perform better than mountain fynbos plants, as again, they have adapted to disturbances other than fire. Think of the mesembs, fynbos bulbs and *Freylinia* for example, and the ease with which they grow. Molerats play a vital role in the sandy soils of the strandveld and coastal fynbos regions and plants such as Bokbaaivygies *Dorotheanthus*, vetkousies *Carpanthea*, *Trachyandra* and many of the bulbs are adapted to molerat predation. They are also adapted to a winter rainfall climate, and do not perform to their optimum in summer rainfall conditions. Restios are fairly adaptable – more so than many other fynbos species.

Generally fynbos has low overall garden fitness. They are difficult to cultivate and propagate, and cannot tolerate general garden disturbances.

#### Garden-fit plants elsewhere in South Africa

Bushveld plants are generally easy to grow in the bushveld. They need dry summers, cool night temperatures and wet winters, and they cannot tolerate frost and low temperatures, factors that exclude them from growing well in most

other garden types (i.e. the highveld, fynbos, strandveld, forest and Karoo regions). Think of the attractive impala lily *Adenium multiflorum*: it would certainly die if planted in poor soil and exposed to wet winters and would need to be grown in a container and taken indoors during winter.

Plants from the succulent and Nama Karoo regions are easily propagated and grown but do not thrive in areas with a high rainfall. They die from fungal diseases and competition from other fast-growing garden species. They have a high local garden-fitness but low overall garden-fitness and require protection. We have grown Karoo plants at Kirstenbosch with difficulty in well-drained soil on the Mathew's rockery. The cooler conditions prevent many from flowering and in the end they die. That is why the Botanical Society Conservatory was built so that plants from all over South Africa can be grown in a controlled climate.

Plants from the afro-temperate and lowland forest regions have a fairly high overall garden fitness. They have adapted to disturbances on the forest floor and can take rough handling. *Plectranthus*, forest floor succulents, *Dietes*, *Scadoxus*, *Clivia*, *Dracaena* and *Rhoicissus* are other plants with a high overall garden fitness.

Some plants originating in grassland also have a fairly high overall garden fitness and are grown widely today. With a history of adaptation to a combination of grazing, fire and frost, many of the highveld bulbs and herbaceous plants are popular garden subjects. These include *Kniphofia*, *Agapanthus*, *Gladiolus*, *Scilla*, *Rhodohypoxis* and *Osteospermum*.

#### The best recipe

The Eastern Cape has the best recipe for producing plants that can survive in gardens anywhere in the world: a semi-arid climate, unpredictable rainfall, disturbances from trampling and grazing animals, variable soil and light conditions, and mild to hot temperatures. We can safely predict that the chances of finding other international horticultural hits from the Eastern Cape is greater than anywhere else in South Africa. The Eastern Cape flora should be protected as a valuable cradle of world garden and house plants. A botanical garden in this region is a must! 🌿

\* See *Veld & Flora* 82(2) June 1996 through to 85(3) September 1999. Many of these back issues are still available from the Publications Manager at the Botanical Society, Private Bag X10, Claremont, 7735. Tel (021) 797 2090, fax (021) 797 2376, e-mail [hotsocsa@gem.co.za](mailto:hotsocsa@gem.co.za).