Coppicing

There is a great variety of tree shapes, sizes and architecture in southern Africa. Some have fat stems, others are tall and lean, some are short and squat, and others are relatively unbranched. There are trees that have a sparse canopy and there are some with a dense, heavy canopy. The huge variety of forms is a result of evolutionary pressure. Trees have **adapted to their environment** in many ways. **Adaptations** are features that animals and plants have that allows them to **overcome challenges** and live successfully in their habitats.

What are the biggest challenges for trees?

- Ensuring that future generations survive – this involves pollination, fertilization, seed dispersal and the germination of seeds.
- Coping with a whole range of pests and diseases and herbivores – for example, being eaten by an elephant.
- Coping with fire and storms.
- Competition from other plants for sunlight, water and space.

Trees have evolved many ways of overcoming these challenges, and one of their survival strategies is the ability to **coppice**. Many trees coppice. Coppicing is a survival **response to damage** by which trees produce substantial shoots from adventitious (dormant) buds that remain hidden beneath the bark until such time as the tree is damaged, or the tree starts to age and die. It is thus a form of vegetative survival and renewal.

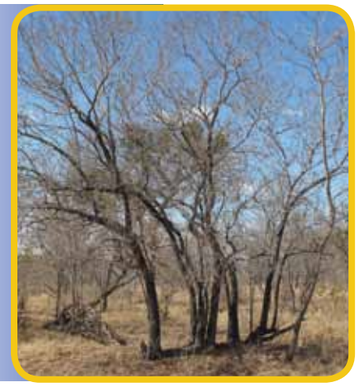
RIGHT: Close up of a Mdoni Waterberry (*Syzygium cordatum)* re-sprouting from its base.

Digging in: Survival

What are the evolutionary pressures that have resulted in so many trees with this amazing ability to coppice? There are clear advantages for coppicing because if trees are damaged (for example, pushed over in a wind storm or in a flood, or by an elephant, or browsed heavily by other herbivores, or burned) then they can re-sprout and maintain their space in a highly competitive environment. One must remember that to germinate, grow and get established trees have to endure a huge number of tough environmental pressures. (Read the article **The long walk to treedom** by Glen Moncrieff, vol. 96(1), 22-23, in the March 2010 issue of *Veld & Flora*.) Once established, trees would not want to vacate their space, and those that tend to coppice with age have the advantage of being able to produce fresh young growth to replace old and decaying woody tissue; and so also keep their space in the community. It thus confers on trees a competitive advantage.

The River Thorn (*Acacia robusta*) shown above, is a survivor that coppices readily. It is a riverine specialist that is knocked over in occasional flash floods.

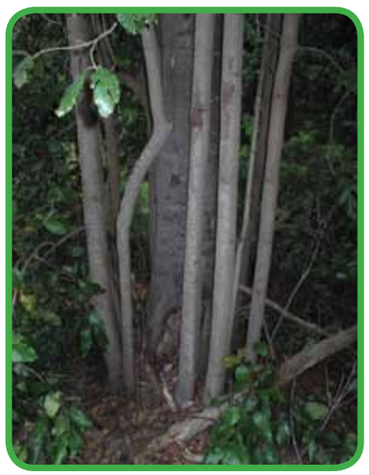
Outwitting fire and grazers: Savanna



In the savannna and bushveld it seems that all trees are capable of coppicing. Examples range from the largest of trees like the African Baobab (*Adansonia digitata*), and Ebony Jackal-berry (*Diospyros mespiliformis*) to the smaller thorn trees (*Acacia*), bushwillows (*Combretum*) and Buffalo-thorn Jujube (*Ziziphus mucronata*), all of which coppice prodigiously. Of course all the shrubs coppice too. The Red Bushwillow (*Combretum apiculatum*) shown left is a vigourous re-sprouter, which is of great advantage in times of drought. Elephants partially knock the trees down and chew the roots to get water. The trees are also subjected to fires and are able to survive thanks to their coppice growth. In fact the whole tree architecture, with its characteristic wand-like branches, is totally adapted to survive such damage. Elephants love the African Marula (*Sclerocarya birrea*) and break off branches to eat the leaves and fruits, tearing off huge chunks of bark and toppling trees to get water from the roots. As a result the tree's ability to coppice is a good survival strategy, as you can see on the right where the new branches growing up from the fallen trunk are clearly visible. Above right is a Knob Thorn (*Acacia nigrescens*) showing recent elephant damage.

Taking advantage: Humans

Humans have used the ability of many shrubs and trees to coppice to our advantage. In *Curtisia*, if intentionally damaged, the resulting coppice makes excellent spear shafts – hence the common name 'assegai', and the Zulu-speaking people have been exploiting this for centuries. There are many other examples. In England, farmers once used coppicing species to establish living hedgerows, and plantations of gums are often managed for coppice growth because they produce more poles per hectare than is possible from one tree.



Surviving into old age: FOREST

In forest good examples of coppicing trees are African Wild Peach (*Kiggelaria africana*), Forest lemonwood (*Xymalos monospora*), African Assegai (*Curtisia dentata*) and Black Stinkwood (*Ocotea bullata*). In fact in our South Africa forests almost all the trees are capable of coppicing – certainly when young, but some are able to coppice as an age survival strategy. Notable exceptions are the yellowwoods which don't coppice, but there is always one exception that proves the rule – the Breede River Yellowwood (*Podocarpus elongatus*), which is not a forest species but rather a riverine and rocky outcrop specialist in the fynbos (see box below). Old African Wild Peach (*Kiggelaria africana*) trees, shown above, usually have many young coppice shoots, and when the old stem dies, only one of these coppice shoots becomes the next trunk. Forest Lemonwoods (*Xymalos monospora),* shown left, on the other hand, often have a few trunks, as when the original single-trunked tree dies it is replaced by two to five coppice shoots that all become big trunks.

A low coppice zone: Fynbos

In South Africa, one region, very rich in plant species, is characterized by the fact that many of the shrubs and small trees present do not coppice. In fact a characteristic of this biome, the Fynbos Biome, is that many of the woody plants are 'obligative re-seeders' after they are killed by fire. This means that they only survive by producing seeds and cannot coppice or re-sprout. This is the reverse of our savanna and forest biomes.

Re-sprouters also have seeds, but young plants are rare as survival is mostly by re-sprouting. So whereas 95-100% of the shrubs in grasslands and savannas (and forests) are re-sprouters, only about 30% of fynbos species are re-sprouters, the rest (about 70%) being obligate re-seeders.

The Breede River Yellowwood (*Podocarpus elongatus*), above, is one of our four species of yellowwood and the only one with the capacity to coppice or re-sprout. A Western Cape endemic, it prefers to grow along rivers in fynbos where it is subject to episodic flooding. When the trees are knocked down in floods, the ability to re-grow ensures its place on the river bank.

Read more

Discover more about our trees in these articles in back issues of *Veld & Flora*.

The long walk to treedom by Glen Moncrieff, vol. 96(1), 22-23, March 2010.
Why do grasslands have no trees? by Julia Wakeling, vol. 96(1), 24-25 March 2010.
How we lost the African acacias, vol 98(1), 26 March 2012.

Text and photographs (unless directly credited) by Eugene Moll.
Download these articles at http://LABpages.blogspot.com.
Please note that we are still using the name *Acacia* although in the future it will be changed to *Vachelia* or *Senegalia*.

What does that mean?

Coppicing The production of substantial shoots from adventitious buds that remain hidden beneath the bark until such time as the tree is damaged basally, or the tree starts to age and die. It is a form of vegetative survival and renewal.

Tree A substantial woody plant with a single stem, usually unbranched for a metre or two, and more than 3-4 m tall. **Shrub** A woody plant that is many stemmed from the base.
(In South Africa our National List of Trees includes shrubs and woody climbers or lianas).

Trees come in all shapes and sizes. **FAR LEFT**: Umbrella Thorn (*Acacia tortilis*). **RIGHT**: The Namibian Kobas (*Cyphostemma currorii*). Photo: George Preschern.