

***Faidherbia albida* (Syn. *Acacia albida*, Family: Fabaceae – Mimosoideae)**

Introduction to planting trees in dry regions

In very dry regions, planting trees has not only been shown to increase soil fertility and therefore crop yields, but also to increase the level of the underground water table, sometimes by several metres. Trees also act as a wind break, which in dry regions is very important because they prevent crop seeds being blown away. The most effective way to reforest is to erect a fence and do nothing! Then a variety of indigenous trees simply sprout and grow of their own accord.

Botanical information for *Faidherbia*

Faidherbia albida is one of the largest thorn trees, reaching up to 30 m in height, with spreading branches and a wide, rounded crown. The roots can grow up to 40 m deep. The fruits are bright orange to red-brown. It is leguminous.

Ecology and distribution

F. albida grows in semi-arid zones, on the banks of seasonal and perennial rivers and streams, on sandy alluvial soils and on flat land. It thrives in climates characterized by long summers, or a dry season with long days. It tolerates seasonal waterlogging and salinity but cannot withstand heavy clayey soils.

It is native to many African countries from Sudan to South Africa. Altitude: -270-2700 m, mean annual temp.: 18-30 deg. C, mean annual rainfall: 250-1000 mm Soil type: Coarse-textured well-drained alluvial soils.

Benefits of *Faidherbia*

1. Improvement of soil fertility

A wonderful tree for increasing soil fertility! If you look at the grass, maize, sorghum or millet growing under a *Faidherbia* tree, you see that it grows by far the best under the tree – and the nearer to the tree you come, the better the crop thrives. With eucalyptus, exactly the opposite is true.

It has been shown in research conducted in Malawi that the yield of maize under the canopy of *Faidherbia* is 25 to 50% higher than in the surrounding area. Research in Senegal showed an increase in the yield of groundnuts was over 40%, and of millet an amazing 152%!

This same research showed that, when *Faidherbia* trees are planted at intervals of 14 metres in both directions, the soil shows a very significant increase in carbon, nitrogen, calcium, magnesium, potassium and phosphorus – all the nutrients and more found in commercial fertilisers!

2. The tree has leaves in the dry season but not in the rainy season!

At the start of the rainy season the tree drops its nutrient-rich leaves onto the ground, thus providing light and good soil conditions for growth. Then in the dry season the tree has a dense canopy of leaves, which provide welcome shade.

3. Other benefits

The seeds can be eaten in the dry season. The leaves and young branches provide fodder for livestock and the pods for goats. The branches provide fuelwood and poles. The tree produces flowers at the end of the rains, which is good for bees which have little pollen available at this time.



This photo was taken in a dry year with erratic rainfall in Gwembe Valley South, Zambia. It shows maize thriving under a *Faidherbia albida* tree, whereas it had failed in the open spaces beyond the spread of the tree's canopy. On the far right of the picture is another *F. albida* tree under which sorghum or millet is successfully growing.

Photo and info: Bob Mann

Cultivation

Before sowing, scratch the very hard seeds with a sharp knife and soak in water overnight. It is good to sow the seeds of this tree exactly where the tree is required – because the tree has a long, deep tap root and does not like to be transplanted. The recommended spacing is 10 metres by 5 metres. This ensures an adequate density of surviving trees. Put three seeds in each place together with a bit of good soil. As the trees begin to grow, cover them with thorn branches – otherwise cattle and goats will feast on them.

Alternatively sow the seeds in open ended containers measuring 20 cm in height by 15 cm diameter in order to ensure the long tap root grows straight. The containers should be on platforms above the ground. A platform of size 1 x 1 metre will support 150 seedlings in containers of this size. The roots stop growing as soon as they make air contact upon reaching the bottom of the container. Then fine lateral roots develop in the containers. The seedlings should be planted out in wet soil during the rains not more than 10 weeks after sowing. This has been named an “air nursery”.

The first season’s growth of these trees is better when planted with low crops such as soya beans and groundnuts rather than with a tall plant like maize.

As the trees grow and mature, they should be thinned out according to the following table:

| Tree canopy radius | Recommended tree spacing | Recommended tree density |
|--------------------|--------------------------|----------------------------|
| 3 metres | 10 x 5 metres | 200 trees per hectare (ha) |
| 5 metres | 10 x 10 metres | 100 trees per hectare (ha) |
| 8 metres | 10 x 20 metres | 50 trees per hectare (ha) |
| 10 metres | 20 x 20 metres | 25 trees per hectare (ha) |

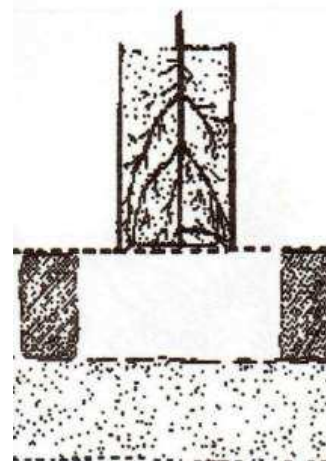
Faidherbia may also be planted at intervals in hedges planted along contour lines, e.g. in hedges of vetiver grass (which has very deep roots and is ideal for stopping soil erosion on steep slopes). In order to encourage the trees to develop a wide and high crown the lower branches should be pruned to give a clean trunk.

Stories regarding cultivation

1. Report from a farmer in Sinazongwe District , Gwembe Valley South, southern Zambia: After his goats and sheep have been eating the dry ripe pods which fall down under mature *Faidherbia albida* trees on his farm, at night he puts them in a livestock pen built on a raised platform made of straight tree branches side by side. During the night the droppings fall between these branches to the ground below from where he collects the dry droppings, puts them in basket, and then broadcasts the droppings out over his land in those fields where he wants to have more *Faidherbia albida* trees growing. The chewed-up pods release the hard seeds on passing through the animals digestive system, receive sufficient acid action to make the seed skin porous, and when excreted in droppings the seeds are then in an ideal condition once they are exposed to soil and moisture.
2. A commercial farmer with a cattle ranch on the Tonga Plateau in Zambia planted seed directly into the field in the manner described above at the required spacing and the seeds germinated well. There was, however, some loss of planted seed when rats dug up the seed to eat. To counter this problem, the farmer used a natural ecological method; he put perches on adjacent indigenous trees to attract owls to the area to hunt the rats!

Reference: Malawi Agroforestry Extension Project (MAFE), “Landcare Practices in Malawi”, March 2002.

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A *Faidherbia* seedling in an “air nursery” – showing the tap root that stopped growing, and the lateral roots which did grow.