

Species Trials

This area is part of a network of 14 tree improvement sites across the southern highlands to expand the diversity and improve the quality of planting material for long-term resilience and competitiveness of the Tanzanian forestry sector. These sites are set up with many private and public partners to scientifically assess the growth of a wide variety of pine, eucalyptus, *Corymbia* and clonal hybrid eucalypts. Over 50 species/subspecies and 100 families are being tested and are all relevant to local wood markets.

Although too early to guide investment decisions, 15-month measurements are beginning to reveal which varieties with potential for commercial deployment:

- *Eucalyptus urophylla*, *E. badjensis*, *E. nitens* and *E. benthamii* were top ranked for growth (the latter three cold tolerant), although stem form was not so impressive in *E. badjensis*. Stem form was superior for *E. cloeziana* (while ranking low for height growth) and *E. grandis*.
- In terms of eucalyptus clonal hybrids, four of the five top ranked clones were all *E. grandis* x *E. nitens* (GHN6, GHN2, GHN5, and GHN1).
- *Pinus tecunumanii* (lower elevation) and *P. maximinoi* were the two top ranked pine species (significantly better than all other species and with 100% survival), followed by *P. patula*.

The Forestry Development Trust was established in 2013 as an independent Tanzanian institution with a long term vision for development of the commercial forestry sector. FDT is running a programme made up of three components:

1. Tree Improvement and Research
2. Tree Grower Services
3. Markets and Policy

More information and resources can be found at www.forestry-trust.org



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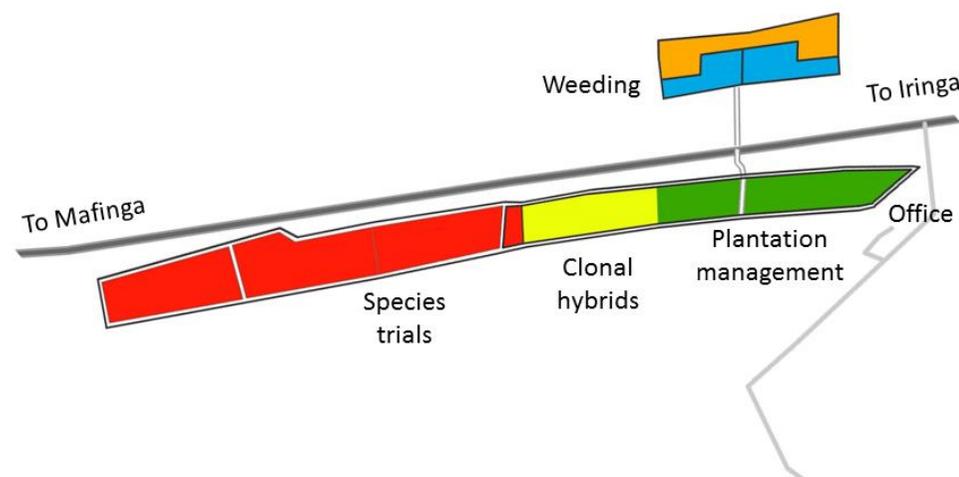
Kisolanza plantation demonstration site

Welcome to the Kisolanza plantation demonstration site, established in 2014 by the Forestry Development Trust in collaboration with Kisolanza Farm. This dynamic training resource is an important landmark in the southern highlands to showcase productivity gains from good planting materials, plantation establishment and management. It is also part of an extensive network of tree improvement sites.

The strategic location on the Mbeya-Iringa highway enables a range of forestry stakeholders to easily access the various learning areas on offer, including tree growers of all scales, traders, policy makers, educators, prospective investors and opinion leaders. The site is also used for organised training and networking events.

Kisolanza plantation demonstration site has five learning areas: plantation management, plantation maintenance, coppice management, clonal hybrids and species trials. The following sections outlines their purpose and early results.

Fig. 1: Map of Kisolanza demonstration site



Plantation management

This area demonstrates the growth potential of improved *Eucalyptus grandis* under optimal management including thorough land preparation, fertiliser application for early growth, full weed and termite control.

In terms of fertiliser application, a positive correlation between fertiliser levels and growth was most pronounced during the first year as the trees outcompete weeds.

This area also highlights the consideration of spacing, thinning and pruning regimes in relation to different target markets given varying effects on growth (utility and construction poles, sawn wood, fuel wood).

Tree volumes respond to spacing regimes and favourable MAI is seen after 31 months of 26-35 m³/ha, as compared with industry average of 15 m³/ha.

Site capture occurred within just two growing seasons, with optimal growth and reduced costs thereafter.

In October 2016, all trees were pruned to 2m while various intensities of selective thinning were applied for demonstration and learning. First thinnings will be sold to the construction pole market.

Fig. 2: Effect of fertiliser on average tree volume of *E grandis* after 31 months

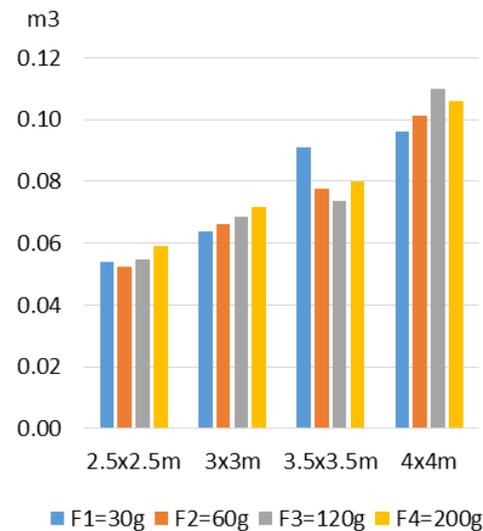
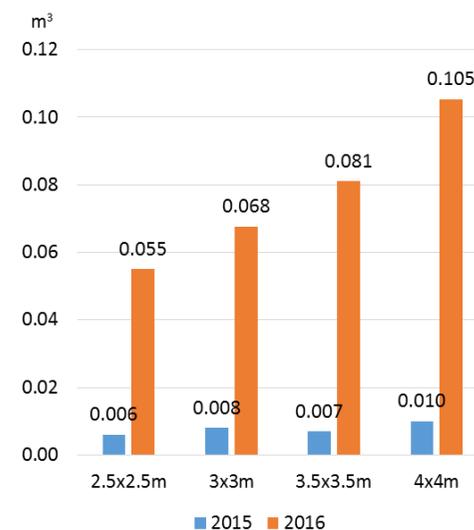


Fig. 3: Effect of spacing on average tree volume of *E grandis* after 16 and 31 mths



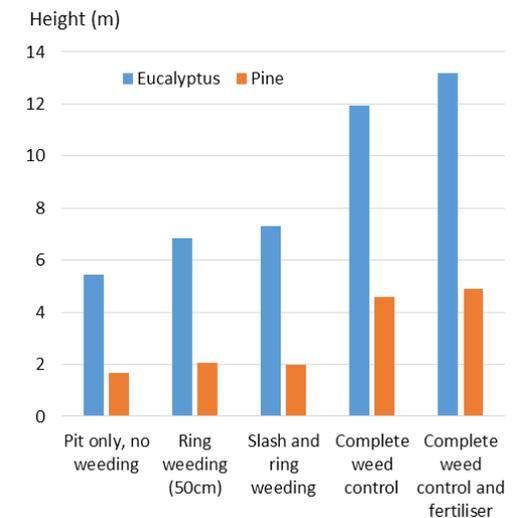
Plantation weeding

This area highlights the importance of weeding on tree survival and growth. Eucalyptus is highly sensitive to competition; un-weeded plantations can expect 96% mortality.

Results after 31 months show how complete weeding more than doubles growth of pine and eucalyptus.

In general, the productivity of tree growers of all scales is affected by poor maintenance. Growers should only plant an area that can be maintained weed-free until site capture.

Fig. 4: Effect of weeding regimes on pine and *E grandis* after 31 months



Clonal hybrids

This area shows the growth potential of six clonal hybrid eucalypts under good management, and specifically highlights the need to consider target market (e.g. poles versus pulp) when selecting planting material and making silviculture decisions. Inappropriate site-species and site-market matching has affected some industrial plantations in the southern highlands.

GC582 and GC584 are well-suited for the pulp and paper or wood energy markets, with high stocking volumes despite poor tree form.

Fig. 5: Average stocking density of *E grandis* and hybrid clones after 31 months

