

INVESTING IN COMMERCIAL TREE PLANTATIONS IN UGANDA - SOME FREQUENTLY ASKED QUESTIONS

Why Invest in Tree Plantations in Uganda?

There are some very good reasons why people are now investing in tree plantations in Uganda – the main ones being:

- **Climate:** The climatic conditions for growing tree crops are generally excellent, with bi-modal rainfall over a large part of the country and some highly fertile soils too.
- **Growth Rates:** These climatic and edaphic conditions can support very high growth rates of certain commercial tree crops, when managed professionally.
- **Land:** There are large areas of land very suitable for tree plantations in Uganda, both in Central Forest Reserves and also private land.
- **Profit:** If well planned and managed, a commercial plantation operation in Uganda should yield an attractive Rate of Return (RoR) on one's investment. A financial RoR of 14-18% has been predicted in a 2005 study.



2-yr old *Pinus caribaea* var. *hondurensis* in Oruha Central Forest Reserve, near Kyenjojo, western Uganda. The seed was from Australian seed orchards.

- **Demand:** All indications are that demand for timber in Uganda will far exceed supply within 5 years, which is good news for timber growers. The country's mature timber plantations are nearly finished (<2,000ha only) and with replanting only seriously beginning in 2003 (by both private sector and the Government), there is a huge shortfall in supply looming. With Uganda's rapidly growing population and a fast developing economy, there will clearly be a huge demand for timber for general construction, furniture-making, peeler (veneer) logs and transmission poles in Uganda.

Which species are the most suitable to plant?

This depends primarily on the site conditions and the objectives of the planting. The first task is to find out which plantation species are well suited to one's site and then see which of these species best fits the bill with regard to the end product required. By far the main species for timber production in Uganda are *Pinus caribaea* var. *hondurensis* (PCH) and *Eucalyptus grandis*.

On specific sites, other species may also be considered - including *Pinus patula*, *Tectona grandis* (Teak), various *Araucaria* and *Terminalia* species, as well the indigenous Musizi (*Maesopsis eminii*)¹. Some 'minor' species could also be considered but others need testing under Ugandan conditions before they can be recommended for commercial-scale planting².

How long does it take before I can harvest my crop?

This depends on many factors but in particular - the species, the site, the climatic conditions, how you manage the crop and what size of product the market wants. To maximise the financial return, the grower should aim to achieve a product size as soon as. For sawlog (timber) production, the objective is to produce a tree of average diameter at breast height (dbh) of around 35cm, which enables

the sawmiller to achieve reasonable recovery from his mill.

On recommended sites for the main commercial tree species in Uganda, the expected rotations for sawlog production are expected to be:

- *Eucalyptus grandis*: 8-15 years.
- *Pinus caribaea*, *P. oocarpa* & *P. patula*: 18-25 yrs.
- *Maesopsis eminii*: 15-25 yrs.
- *Araucaria* & *Terminalia* spp.: 20-30 yrs.

All these tree crops for timber production will have to be repeatedly thinned during their rotation - and these operations (especially the later thinnings) should yield saleable products. The major income, however, only comes from the final harvest of the crop at rotation age.

Why should anyone want to invest in such a long-term venture?

Individuals and organisations invest in plantation forestry for many different reasons: the prime reason, however, is to make money. Plantation forestry in Uganda offers a good return on investment provided it is carried out well (see next question). Producing high quality sawlogs also offers excellent opportunities for adding value through primary (sawmilling) and secondary processing (manufacturing finished timber products).

The shorter rotations possible with *E. grandis* grown for sawtimber, make it more attractive than pines as an investment but there are drawbacks e.g. *E. grandis* requires good sites and

¹ For more details see *Plantation Guideline No. 5 – Tree Species For Commercial Plantation Development in Uganda and Guideline No. 6 – Site-Species Matching in Uganda*.

² For more details see *Plantation Guideline No. 13 – Other Species For Timber Production in Uganda*.

more intensive management than pines and the timber requires careful processing too.

Governments (and donors in developing countries) often invest in forestry for other reasons – e.g. to take pressure off natural forests (particularly important with Uganda’s rich biodiversity under severe threat), to ensure watersheds are protected, to provide rural employment and importantly to save on the foreign exchange needed to import timber in the absence of a local supply.

Many private tree growers also gain an enormous amount of personal satisfaction from growing trees too: something that is difficult to put a price on. If this love of trees can be combined with making money from the venture, then it is more likely to be sustainable.

What rate of return can I expect from tree planting?

A study conducted for the SPGS in mid-2005 by LTS International, investigated the profitability of plantation development in Uganda. The base case for *Pinus caribaea* showed a real Rate of Return (RoR) between 9 and 12%, depending on the growth rates achieved.

When adjusted for inflation at 5-6%, this equates to a 14-18% financial RoR. These calculations assumed a standing log price of US\$ 20/m³ and a range of expected growth rates (though these could be exceeded with the best practices).

The report concluded that these returns were very favourable compared with plantation developments in many countries and would be sufficient to attract investors into the Ugandan forestry sector³.

This study emphasised that the expected RoR depends on the costs of establishment, the productivity of the plantation, the conversion rate of sawmills and the import price of sawn timber. Many of these aspects are under the direct control of planters, especially efficiency, cost control, protection from damage and sound initial planning⁴.

Achieving good prices for the logs will require a competitive market amongst processors and also an efficient processing industry (which would enable the sawmillers to offer a fair price to the growers).

What is the minimum plantation area that is economic?

This depends on a number of variables such as the product, the markets and the location of ones plantation(s). A tree plantation business from a few hectares upwards can be profitable provided it has been grown in the right place (close to market), grown well (good quality and high yielding) and produces the right product (the size and species the market wants).

³ Hardcastle P.D. et al, 2005. *Improving the Investment Environment for Private Sector Plantation Development in Uganda. A study carried out for the SPGS (copies of this study are available from the SPGS).*

⁴ Refer especially *Plantation Guideline No. 3 – Planning for Successful Plantation Development.*

More serious forestry investors, however, normally require substantial areas to achieve economies of scale and to ensure sufficient product to supply a sawmill. Around 4-5,000 ha is usually considered the minimum size, which would be expected to produce at least 50,000 m³/yr (roundwood intake), sufficient for a dedicated, modern sawmill⁵. This size of enterprise is much more likely to justify the recruitment of experienced, professional staff as well as making mechanisation more attractive too.

Smaller investors need to ensure that their plantations are within reasonable distance of such sawmills (NB. we are assuming that within 10-15 years, as the current young crop reaches maturity, that Uganda will have proper sawmills with high recovery and not the highly inefficient Lucas saws currently operating in Uganda's plantation sector - see next question).

What markets are available in Uganda?

The principle markets for commercial forestry plantations in Uganda are sawtimber, peeler (veneer) logs and transmission poles. The specification for sawlogs and veneer is very wide but higher prices will be obtained for evenly grown, straight, round logs of at least 30 cm diameter.

The specification largely depends on the type of logging equipment available and the type of sawmill for processing the logs: the assumption is that by the time the crops currently being planted mature in 15-20 years

time, the processing industry in Uganda will have efficient machinery and processing units.

Sawmillers currently buy their timber standing from the NFA in small coupes. Virtually all sawmilling in Uganda is currently carried out by small, mobile sawmills. Most of these - and especially the Lucas mill - were designed to process large, individual logs, not small plantation grown trees. When such mills cut small logs they are extremely inefficient, often as low as 20% recovery of sawn timber.

Compared with the industry norm of at least 40% recovery from fixed (band and frame) saws, the wastage from these small mobile mills is thus enormous. It is assumed that the primary processing facilities in 15-20 years time in Uganda will be larger, fixed mills, centred around the main plantation areas now being developed by both NFA and private sector - especially Mbarara, Lendu (West Nile), Mubende, Katuugo (Nakason-gola), Kyenjojo/Fort Portal and the Jinja/Mayuge region.

There is currently one established private company in Jinja - Nileply Ltd. - who purchase plantation logs (pines and Eucalypts) suitable for peeling for veneers. Although forced by circumstance to currently accept small logs, their normal minimum diameter log is 30 cm. Better prices can be expected for large, clean (i.e. pruned) logs.

It is a surprising fact that UMEME Ltd. (formerly Uganda Electricity Board) currently import most of their

⁵ *A modern pulpmill requires substantially more area than this but the focus is on sawtimber at present in Uganda.*

large transmission poles from Tanzania and even South Africa. No doubt this will be remedied as Ugandan growers recognise this excellent market opportunity on their doorstep but care must be taken to ensure their strict specifications are met (*Eucalyptus* species provide most of their poles)⁶.

By-products from the growers' main timber growing operation will be pulpwood or chips, fuelwood material and (in the case of *E. grandis* especially), building and fencing poles: most of these materials will come from the thinning of the main crops. In time there may be specific markets for biomass for energy production.

At present there is no market for small diameter material (for pulp or chipping) in Uganda, though a few companies are seriously looking into this. There is a pulpmill in western Kenya - nr. Nakuru <100kms from Uganda's border, though their specifications are not known.

There exists already a thriving local market for building poles, which nearly all are *E. grandis*. Building and fencing poles can be anything from two years old upwards. The demand is primarily from the urban centres and thus plantations in remote areas (or those with difficult access) will be at a serious disadvantage, having to bear high transport costs. A treatment plant, however, would add significant value to fence posts and there are some such plants operating in Kampala.

⁶ Refer Plantation Guideline No 10 – Growing *Eucalyptus* For Timber and Large Poles.

The market for fuelwood is also significant, though it is a local market, supplying individuals and rural wood-using industries, especially brick-making. The main Ugandan plantation species - pines and *E. grandis* - are also not the best firewood - pines being light and resinous (hence they spit) and *E. grandis* being light and fast burning (i.e. not very dense).

There may also be markets for some non-timber products from plantations e.g. the bark from *Prunus africanum* (an extract of which is used for the treatment of prostrate cancer)⁷; essential oils from certain *Eucalyptus* species⁸ or resin tapping from PCH⁹ - but in most of the cases either the markets are not well developed or the desired species do not perform well in Ugandan plantation situations.

In summary: before embarking on a major investment in plantation forestry it is crucial to consider the target market - especially the specifications in terms of species, size and quality - and also the distance to market, which can make or break a forestry business.

⁷ Although there has been considerable recent interest in *Prunus africanum* amongst potential investors in Uganda, it is untested in plantations in Uganda and has proved difficult in other countries.

⁸ Refer Paper by Jacovelli PA, 2002. Cultivation and Production of *Eucalyptus* in Africa: With Special Reference To Leaf Oils. In Coppen J. (Ed.) Medicinal & Aromatic Plants – Industrial Profiles Vol. 22 – *Eucalyptus*. available from the author: email - paulj@nfa.org.ug

⁹ The resin yields turpentine and rosin (used in paper and adhesive manufacture). Refer Coppen JJW, 1995. Prospects for New Gum Naval Stores Production in Sub-Saharan Africa. Natural Resources Institute (UK) (summary available from SPGS).

Which export markets might be worth targeting?

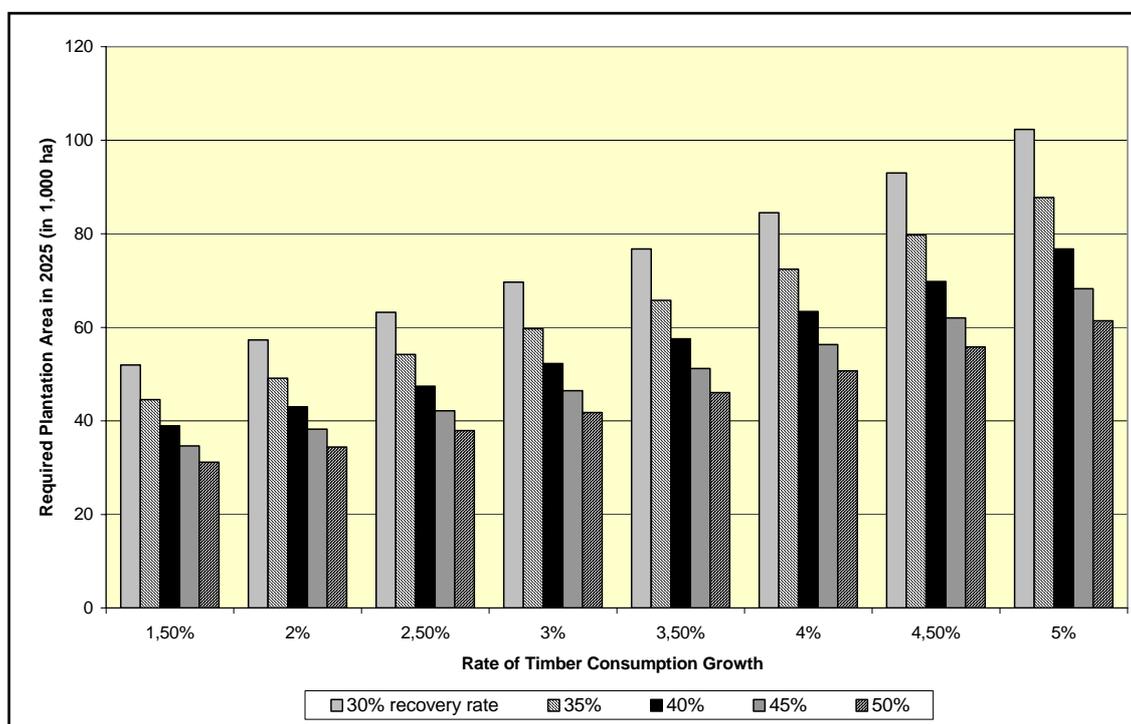
At this early stage of commercial plantation development in Uganda, most investors (including the NFA) are targeting the domestic sawtimber market, which is well known and will be desperately short of suppliers in a few years time. There are, however, many markets overseas that could be supplied from Uganda plantation grown timber. Although landlocked, Uganda has the advantage of very high potential yields and if managed well, its timber products could compete well with those from many other countries. Rapidly expanding potential markets also exist in neighbouring Rwanda and Kenya, which could be easily supplied from Ugandan plantations.

Will I need Certification?

Those investors who are looking at exporting timber (or timber products) from Uganda will almost certainly have to obtain independent certification to prove that the wood came from sustainable operations. The best known of these is the Forest Stewardship Council (FSC), which insists on very high standards of management (including environmental and social issues) before it gives its seal of approval¹⁰.

What is the timber supply-demand scenario?

It has been estimated that a total plantation area of 40-100,000 ha is required just to meet just Uganda's domestic timber requirement by 2025 (see figure below)¹¹.



Source: Kallweit, 2005.

¹⁰ Refer Plantation Guideline No. 30 – Forest Certification: Key Issues and Implications For Uganda.

¹¹ Refer Kallweit K, 2005. Reducing the Uncertainty for Forest Investors in Uganda: Value Chain Assessment for Timber & Timber Products. Study carried out for SPGS by Unique Forestry Consultants (available from SPGS).

The table highlights the importance of recovery in the mill too. A study for the NFA in mid-2005 used a figure of 67,000ha as a guide. This is based on current consumption estimates of sawntimber of 270,000m³/yr and using growth consumption figures of 1.5-5.0%/yr.

The figure below clearly shows the seriousness of the current (and future) supply side with a huge deficit in supply looming within the next 5 years when all the mature (>25yrs) age class has been harvested.

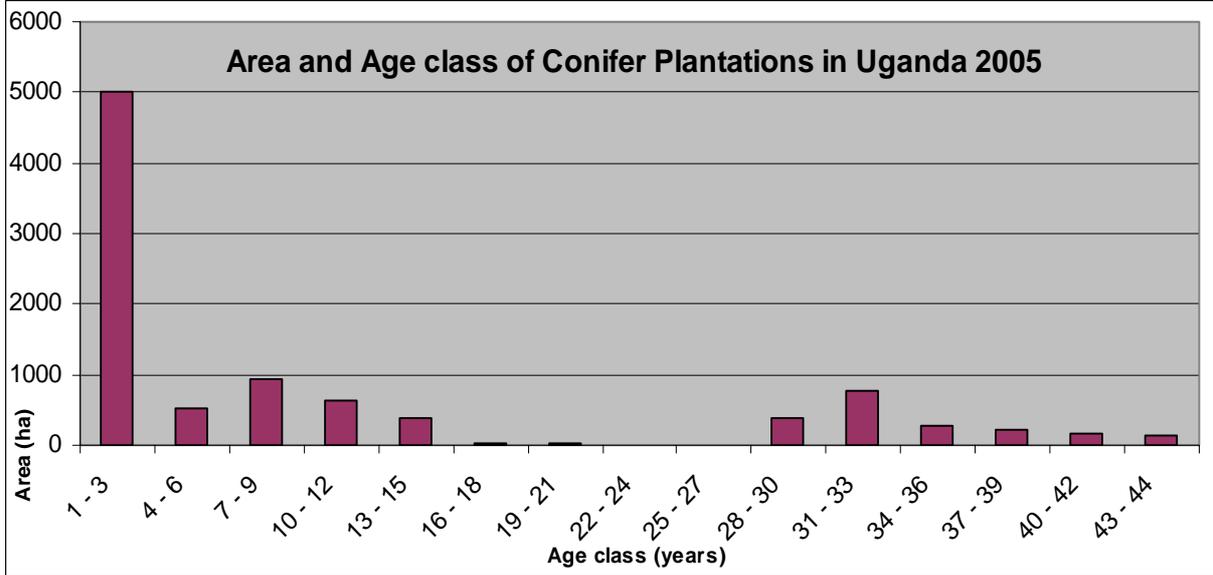
This scenario is largely due to the failure of the Forest Department to replant its (largely softwood) plantations as they have been harvested since the mid-1990's and also the lack of support for private sector involvement in commercial planting too. The mature (and in many cases over-mature) plantations of >25 years are being sold standing by the NFA for harvesting over the next 5-8 years, after which there is a massive shortfall in supply before the

younger plantations come on stream (see table below).

Whilst this situation is worrying for the country as a whole, it does represent a great opportunity for investors in the commercial tree planting sector in Uganda.

Will the NFA compete directly with the private sector?

The market demand (as highlighted in the previous section) is predicted to be so large that there should be ample room for both the state (NFA) and the private sector. It is likely that the NFA will invest substantially in plantation development (it is on target to have planted ca. 3,000ha in its first two years - to mid-2006 - and is currently investigating options for financing up to 30,000ha over a 10-yr period). It is, however, a clear policy objective of the NFA (and enshrined in the 2003 National Forestry & Tree Planting Act) to support private sector development.



What does it cost to establish a plantation?

The SPGS has calculated that *on average* it costs Ushs 1,200,000 (*ca.*US\$650) per hectare to establish a commercial tree crop in Uganda¹². This cost has been based on the establishment costs up to ‘canopy closure’, which is normally around 3 years with PCH (using improved seed) and 1 year with well-grown *E. grandis* in Uganda. The costs can vary markedly depending on:

- The level of planning and timing of land preparation and establishment operations;
- the nature of the land being prepared (e.g. slope and existing vegetation);
- the level of supervision and training of labour;
- weed control before and immediately after planting;
- the quality of the seed and seedlings.
- the timing of planting and beating up.

Where can I obtain additional advice from?

The main sources of advice are the National Forestry Authority (NFA) and the SPGS. Contact details are:

NFA: tel. 031 264 035/6

web www.nfa.org.ug

SPGS: tel. (via NFA) or 078 673 899

web: www.sawlog.ug

The NFA/SPGS Plantation Guideline series are useful, practical publications to assist those involved with commercial planting in Uganda. Many are in colour and completed ones are available from both NFA and SPGS offices as well as in digital form

(that can be down-loaded and printed) from the SPGS’s web-site. There are also a few useful books on tropical plantation forestry which are recommended, namely:

- Evans J & J Turnbull, 2004. *Plantation Forestry in the Tropics* (3rd Edn.). Oxford University Press.
- Lamprecht H, 1989. *Silviculture in the Tropics*. GTZ (Germany)¹³.
- The South African Institute of Forestry, 2000. *South African Forestry Handbook* (2 vols.).

Is there any financial assistance available?

Plantation forestry is a long-term and somewhat risky – venture, which is why commercial banks are not keen to support it. Although rotations can be reduced by adopting intensive silvicultural practices (such as improved seed, heavy early thinning and - where sites are suitable - planting faster growing Eucalypts instead of pines) and the risks reduced by good management (see page 12), forestry still struggles to compete with many other ‘safer’ business investments.

To encourage the private sector to become engaged in commercial tree planting, the EC-funded Forest Resources Management and Conservation Programme (FRMCP) offers grants of Ushs 600,000 per hectare through their Sawlog Production Grant Scheme (SPGS)¹⁴. Although the SPGS is currently fully subscribed, there are indications that it may be continued beyond its current end date (Dec 2006).

¹² Refer *Plantation Guideline No. 4 – Productivity and Costs of Plantation Development in Uganda*.

¹³ *Out of print*.

¹⁴ For more details see *Plantation Guideline No. 2 (v.2) – SPGS – Frequently Asked Questions*.

What other incentives are there for private investors in tree planting in Uganda?

There are a number of promising signs for private investors in plantations in Uganda - the main one being the interest expressed in continuing the SPGS subsidy for private planters. During late 2005/early 2006, the SPGS is thus being reviewed to see how it could be improved should it continue beyond 2006. The aspects being looked at include:

- The minimum standards required to claim the grant.
- The need to encourage planters to prune and thin their plantations.
- The need to provide continued technical support to growers.

Other incentives for private growers include the formation (Nov. 2005) of a private tree growers association (formal name not yet announced) who will give members a more powerful voice in the sector and the SPGS's ongoing lobbying of Government over the unfair fiscal treatment of forestry. Regular updates on these issues will be posted on the SPGS's web-site - www.sawlog.ug

Is there Carbon money available?

There has certainly been a lot of talk over the past few years about funds being made available for plantations. The Clean Development Mechanism (CDM) agreed at Kyoto in 1997, paved the way for developed countries to meet their emission reduction targets by generating 'carbon credits' from tree planting projects in developing countries. It has taken a

long time (and lots of meetings and talking of course) to get to the stage where funds are starting to materialise but the signs are promising at long last.

In 2005, the NFA signed contract with the World Bank's BioCarbon Fund to establish 1,600ha of new plantation in Rhoho CFR, nr. Mbarara. This project should be a useful lesson for others. Whilst the scale this project might be beyond many potential investors, there has also been a lot of recent interest in the possibility of accepting small-scale 'bundled' projects forestry plantations under CDM. These are projects that are expected to result in net greenhouse gas removals of <8,000 T Carbon per year and developed by low-income communities or individuals.

2005 has seen an explosion of Carbon credits being traded in Europe and the SPGS is actively investigating the possibility of bundling a number of potential private growers together to attract additional funding. Updates will appear in the SPGS's bimonthly Newsletters.

Where can I recruit skilled managerial/supervisory staff?

There are many local forestry graduates (from Makerere University) and diploma-holders (from Nyabyeya Forestry College) looking for work in Uganda. There are also a number of capable ex-Forest Department staff, who didn't manage to get employed by the NFA. It must be remembered, however, that very few people (students and foresters alike) have experience of the type of commercial

plantation forestry being advocated - and increasingly practiced - in the country.

Where can I find skilled contractors?

Many people ask us this question and we normally have to reply that there are very few around and they will usually have to recruit and train their own staff. Commercial forestry is in its infancy in Uganda, since virtually no large-scale plantations were established for almost a 30-year period until around 2002/03. Consequently there is a major shortage of skills relating to plantation forestry. The situation is changing, however, as people are being increasingly exposed to the 'culture' of a much more intensive management regime.

Where can I train my workers?

Most of the training is 'on the job', which means that serious planters must have an experienced manager or supervisor. The supervisors must be exposed to the techniques of modern silviculture and (in the case of the SPGS) the required standards.

The NFA/SPGS run a series of training courses aimed at commercial tree planters. The following courses are run periodically:

- Plantation Planning and Establishment (5 days).
- Plantation Maintenance (4 days).
- Fire Protection (2 days).
- Nursery Management (3 days).

The latest information on the above courses can be found in the SPGS's Newsletter and at www.sawlog.ug

The NFA's Private Forest Promotion Centre also run periodic training courses targeted at smaller tree planters, NGOs and community workers etc. Contact the NFA for further details.

Do I have to start my own nursery?

A few years ago, commercial tree planters in Uganda had no choice but to develop their own nurseries to supply seedlings. This situation has now changed with the NFA and a growing number of private people too, rapidly developing good quality nurseries. The decision to start one's own nursery will often depend on the location and scale of the investor's planned development.

Over the last few years, the SPGS has persuaded many private tree planters to buy their seedlings from recommended nurseries (both NFA and private sector - see next question) and to concentrate their resources on improving plantation establishment rather than seedling production.

Where can I buy good quality tree seed or seedlings from?

Seed of the main commercial species (pines and eucalypts) can normally be purchased from the NFA's National Tree Seed Centre (NTSC) or can be imported directly from overseas suppliers, provided the importer meets the requirements of the Ministry of Agriculture (an Import Permit from the importer and a Phytosanitary Certificate from the supplier will normally be required). For all commercial planting and

particularly with pines and eucalypts, it is important to buy only genetically improved seed – preferably from clonal seed orchards. Commercial quantities of tree seedlings can be bought from the following recommended nurseries¹⁵:

NFA nurseries:

The National Tree Seed Centre,
(Namanve); Katugo; Mbarara; Mubende;
Lendu and Kyenjojo.

Private nurseries:

Busoga Forestry Co., Bukaleba CFR,
Mayuge; Global Woods, Kikonda CFR,
Hoima; Kamusiime Association, Rutondo,
Bushenyi.

With all seedling orders, it is strongly advised to order at least six months in advance and to pay a deposit (usually at least 30%) to secure your order. NB. In all cases, commercial planters are strongly advised to request details of the seed origin of the tree seedlings to ensure they are getting the best available quality (also only specific seed provenances are accepted under the terms of the SPGS).

Can I buy clonal *Eucalyptus* plants in Uganda?

Clonal *Eucalyptus* plants have generally taken over from seedlings in many countries where eucalypts are planted on a large scale. They are mostly hybrids rather than pure species – especially GUs (*E. grandis* x *E. urophylla*) and GCs (*E. grandis* x *E. camaldulensis*). Whilst these hybrids are widely planted in Central

Africa (Congo Brazzaville), in South Africa and more recently in Kenya, in Uganda they are only in the initial testing phase. Since around 2002, FORRI¹⁶ have established a series of trials since around the country, testing a number of hybrid GU and GC clones (courtesy of Mondi South Africa) over a range of sites.

Whilst a number of these clones are showing great promise, it is still too early to confidently recommend which clones are suited to which sites here (and clones are much more site specific than the pure species). Currently there is no commercial production of these hybrid Eucalypt clones in Uganda though with the greatly increased interest in commercial planting over the next few years, it is expected that this situation will change soon. It also must be remembered that these clones have largely not been tested for their sawn timber properties, as the main market in South Africa is pulp.

Is it true that these *Eucalyptus* clones are mature in just 2 years?

Not quite ... although it does depend on how one defines ‘mature’ of course! Despite very fast growth rates on the right sites and with the best silvicultural practices, the clones will only be suitable for poles and firewood at 2 years. They will probably take at least 8-10 years to reach sawlog size (similar to *E. grandis*).

¹⁵ Note that the nurseries recommended are those which have reached at least reasonable standards of seedling production: there is, however, no independent accreditation of Uganda’s nurseries to date.

¹⁶ Forest Research Institute (part of the National Agricultural Research Organisation, NARO).

What are the risks involved?

Obviously with any long-term venture, there are many things that can happen between planting and harvesting the crop. However, with careful planning, adequate investment and good management, these risks can be greatly reduced. The key issues are as follows:

- Plan and budget well in advance of planting the first tree.
- Good silviculture - especially correct species choice and frequent weeding in the 1st year - ensures a healthy crop, better able to cope with the vagaries of climate and also the threat of pests and diseases¹⁷.
- Ensure the crop is established well: the first year is critical and determines whether high yields will be attained in later years.
- Do not compromise quality: use only quality plants from a recommended seed sources and ensure good weed control immediately before and after planting to achieve good stocking and fast growth.
- Ensure adequate protection from browsing animals: a guard might be necessary for the first few years.
- Ensure protection from fires by having a planned (and maintained) network of firebreaks and access roads. Frequent weeding will also reduce the fire risk¹⁸.
- Ensure the workers are looked after - especially paid on time (other incentives can be housing, food, transport and protective clothing).
- Foster good relations with neighbouring communities.
- Even though the demand for certain timber products may change over the years, there will always be a market for good quality timber so always aim for quality.

¹⁷ Refer Plantation Guideline No. 19 – Common Pests & Diseases of Tree Plantations in Uganda.

¹⁸ Refer Plantation Guideline No. 18 – Fire Protection.

Can I insure my plantation?

There is no insurance company in Uganda that will currently insure tree plantations, primarily due to this being a new and unknown field for them to become involved in. Experience in Southern Africa has showed that many plantation companies opt to invest in protecting themselves - particularly through good fire protection measures and building up a permanent, motivated workforce.

Can I obtain a license to plant trees in Central Forest Reserves?

For many years, numerous CFRs around Uganda were set aside for plantation development but very few were developed (at least for the purposes intended). Some CFRs have already been allocated and are now being planted, particularly since the SPGS started offering planting grants in 2003. Contact the NFA for the latest information.

Where are the best tree growing areas in Uganda?

Many parts of Uganda are suitable for commercial tree crops although the very hot, dry regions are unlikely to support profitable plantations. The highest yields will be obtained with *E. grandis* in the volcanic soils in the wet, cooler areas of the West although *P. caribaea* will also grow very well in some hotter, drier areas¹⁹.

¹⁹ Refer Plantation Guideline No. 6 – Matching Tree Species with Sites in Uganda.