

INSIDE: HEARTWOOD Insert: 12 pages of science, reviews and opinions.

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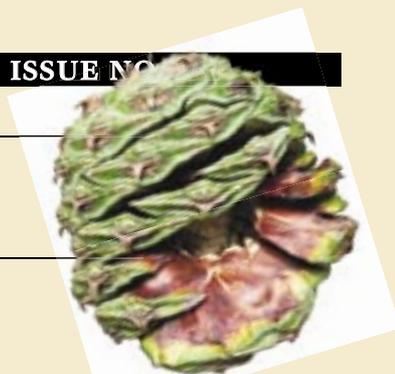


The **Sawlog Production Grant Scheme (SPGS)** is a partnership between the Government of Uganda, the European Union (EU) and the Government of Norway (GoN). In Phase I (2004-09) 10,300ha of timber plantations were supported along with over 400ha by community growers. Phase II (starting Oct. 2009) aims at increasing support to private growers throughout Uganda. **DISCLAIMER: The contents of this publication are the sole responsibility of SPGS and in no way can be taken to reflect the views of the EU or the GoN.**



NURSERY CORNER

by Alex Atuyamba & Celia Nalwadda



1. SEED

SPECIES	ORIGIN	ORG	KGS AVAILABLE	EXPECTED SEEDLINGS PER KG	SALE PRICE PER KG UGX	COMMENTS
<i>Pinus caribaea</i> var. <i>hondurensis</i>	FPQ Australia	UTGA ¹	46	35,000	2,800,000	Contact
	Brazil	NTSC ²	50	30,000	1,300,000	Available
<i>Eucalyptus grandis</i> (Kalitunsi)	Fort Portal	NTSC	60	400,000	90,000	Available
<i>Maesopsis eminii</i> (Musizi)	Masaka (local)	NTSC	2,000	850	50,000	Available
<i>Terminalia superba</i> (Umbrella Tree)	Nandagi, Jinja (local)	NTSC	2,800	13,000	50,000	Available
<i>Pinus patula</i> (weeping pine)	Echuuya, Kabale (local)	NTSC	150	50,000	600,000	Available

¹ Uganda Timber Growers' Association – contact Chairman (0772 435 353), Treasurer (0752 700 744), Secretary (0772 403 120)

² NFA's National Tree Seed Centre – contact David Mununuzi on 0772 466 498. NB. Buyers must always insist on receiving official documentation to ensure the exact origin of the seed from NTSC as they also sell seed that is not permitted under SPGS's rules (e.g. locally collected PCH and *P. oocarpa* from poor quality parent trees).

SEEDLINGS UPDATE

Private Nurseries: see p.19 for details of the private tree nurseries recommended by SPGS.

NTSC has a target of raising the following seedlings for March/April 2010 planting season: PCH (ex-Brazil) - 2.5Million; *E. grandis* (ex-Fort Portal) - 500,000 no.

KAVERA (PLASTIC BAG) UPDATE: on behalf of all private tree growers in Uganda, UTGA submitted an exemption request to the government with regard to the intended kavera ban. It appears that other (non-forestry) users also petitioned for an exemption and now the government is sorting out ways of categorizing different exemptions. An official statement indicating accepted exemptions (and also guidelines) is expected soon. We will keep you posted.

TREE NURSERY OPERATORS MEET

SPGS invited private nursery owners to a special meeting on 4th November 2009, to share ideas about how the sector is going to meet the huge demand for seedlings over the coming few years. This gathering of nursery owners was the first of its kind though it will certainly not be the last. Against the backdrop of what is a fantastic opportunity for those in the business of raising commercial trees, the main issues affecting the industry were discussed in a refreshingly open manner. Clearly by working closely together we can build a stronger base for supporting commercial forestry in Uganda.

With the rapidly growing demand for quality seedling supply here, nursery operators have an excellent business opportunity over the next four years. SPGS has estimated that

the country shall need over 120M seedlings in the next four years, compared to around 50M trees raised over the previous four years. The challenge now is how the existing (or new) nursery operators can expand to meet this huge demand for supply of quality seedlings.

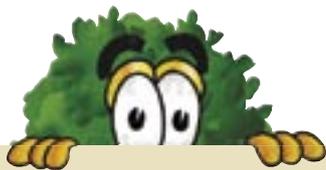
The nursery operators were confident that they had the capacity to meet this demand but they listed two major threats that are likely to hinder their business – namely, the limited supply of improved seed and the proposed polythene ban by the government. Further discussions also revealed that many of them do not have the capital to expand as they might like to. There was also a request for the SPGS to assist them with quality matters by accrediting nurseries that achieve (and maintain) certain standards.

The meeting was told that UTGA could partly be a solution to some of their problems. UTGA has been working closely with SPGS recently on the issue of importing improved seed and is also currently negotiating with the responsible bodies to gain an exemption from the polythene ban (as noted above). SPGS resolved to discuss the accreditation matter with UTGA.

With regard to the lack of capital, it was clear that many smaller nursery operators needed help with developing a business plan, especially if they were to apply to commercial banks for loans. One interesting suggestion was to offer customers a discount for ordering seedlings well in advance and this (provided an advance is paid) greatly helps the cash flow and planning.

Cont'd on p.19

Cover Photo: Ugandan growers learning from the experience of one of the many professional forestry contracting companies in South Africa. This was in one of York Yimber's plantations in Mpululanga, during the SPGS safari in 2009. The crop was 18-yr old *Pinus taeda*, undergoing its 3rd (and final) thinning operation.



MUCH MORE THAN JUST PLANTING TREES

by Paul Jacovelli, SPGS Chief Technical Advisor

In those regions blessed with good rains over the past few months, many people have been busy planting trees. We at SPGS have also been very busy too – making sure that we can offer increased support to these tree growers throughout the country. The great news is that thanks to the generosity and foresight of the European Union (EU) and Government of Norway (GoN), on 4th November 2009 we were able to offer 201 investors contracts for planting over 26,000 hectares (ha) over the next 3 years.

Looking back to 2002/03, when the SPGS was being formulated, I don't think many people would have foreseen that by 2009, Uganda would have almost 20,000 ha of timber plantations established by the private sector. I for one wouldn't have staked my money (or reputation) on it. When you add to this the incredible interest from many more small-medium landowners wanting to invest in tree planting here, Uganda could be self-sufficient in timber by 2020.

Anyway, before I get carried away, let me tell you about what we have been up to. To launch Phase II we decided to call all new clients (as we call our contracted growers) together so that we could interact with them and importantly, inform them of how SPGS works. Two meetings in November '09 covered nearly all the new clients – one held in Kampala (where 168 packed into the Sheraton) and one in Gulu for our new Northern clients (15 attended). The meetings surpassed our expectations; the new clients met all SPGS staff, who were on call to answer questions (see p. 4). We also gave all clients copies of the SPGS *Tree Planting Guidelines* and encouraged them to purchase extra copies for their key field staff.



On 13th Oct. 2009, GoN's Ambassador to Uganda, Bjørg Leite, signed a 4-year agreement with GoU to support SPGS (see p. 15). The joint EU-GoN funding will not just provide financial support for over 30,000 ha but also enable better technical support too, with applied research and practical training top of the agenda (see *Phase II Highlights below*). On 30 Nov. '09, GoN also committed funding to specifically support the building of UTGA's capacity running in parallel to SPGS Phase II.

So the future of commercial forestry certainly looks rosier than for many years in Uganda. There are challenges ahead certainly, but if we can maintain the current momentum for a few more years, we can even start planning to supply our timber-deficient neighbours in the not too distant future. The associated benefits for driving rural development and mitigating climate change are real and will improve the lives of many Ugandans, which is really what SPGS is all about.

SPGS 2009-2013: HIGHLIGHTS

SPGS Phase II is 4-year programme running until 2013. It is certainly ambitious but we believe achievable provided we work together: by 'we' we mean our new clients and communities planting the trees successfully and our many partners needed to support the tree planting. Phase II will focus on the same four key areas as before but we will be able to expand in all areas thanks to the support of the EU and GoN. Below is a summary of the 4-yr programme.

◆ **SUPPORTING COMMERCIAL TIMBER PLANTATIONS:** the planting subsidy has increased (to Ushs850,000 per ha) for small-medium growers (25-500ha); standards have also been raised, especially with regard to environmental and social issues. New support for woodlots (fuelwood plantations) is planned and the pruning and thinning grants have doubled (to Ushs100,000 per ha) to encourage growers to have not only fast growing but also high quality crops.

◆ **IMPROVING SKILLS AND RAISING AWARENESS:** here the project will offer a substantial support service for private

sector growers – by expanding and refining the practical training courses aimed at growers and contractors. The aim is to ensure the introduction and adoption of the most cost-effective (and sustainable) methods of plantation establishment. In close collaboration with UTGA, SPGS will also work harder to 'spread the gospel' to raise awareness not only of the investment opportunity but also the enormous development potential of commercial forestry in Uganda.

◆ **COMMUNITY PLANTING SUPPORT:** we will build on the success of SPGS's community planting initiative which started in 2005. In Phase II, we are planning to supply more than 3 million trees to committed communities around the country. We also have come up with some exciting new strategies for improving our support to these smaller growers (see p.13).

◆ **RESEARCH & UTGA SUPPORT:** with the scale of planting now becoming so large,

the need for applied research to support growers is fast becoming critical. During Phase II we will fund applied research work as prioritized by the COMFORT group (refer *SPGS News No. 21*). We are also committed to building the capacity of UTGA over the coming 4 years so that they will become a sustainable, professional organization.



Green Resources Ltd's Busoga Forest Co. is just one of many private investors seriously planting trees in Uganda today. SPGS's new funding will enable many more growers to be supported throughout Uganda.



We had many questions fired at us at our November new clients' meetings in Kampala and Gulu. Due to space, we cannot print them all but the full set of Q&A are on the SPGS web-site – www.sawlog.ug The questions fall into a number of clear categories and we have below selected a few key Q&A from each of these.

SPGS ADMINISTRATIVE ISSUES (ESPECIALLY FUNDING):

Q. Can I change my contract planting plan? A. Yes, provided you inform us in advance and we agree the changes.

Q. Does SPGS pay for older trees planted before the current contract? No. SPGS can only support clients' trees planted from the Oct/Nov '09 planting season onwards.

Q. What happens if I don't reach my contracted planting targets? Your contract will quickly be reduced to a mutually agreeable (achievable) level and the balance will be reallocated to other growers.

Q. Why does SPGS not finance seed or seedling purchase and maintenance costs? SPGS grant includes the cost of seed/seedlings and maintenance for the first 2 years.

Q. Is the pruning and thinning grant available to everybody and is the grant for separate operations? Yes and yes: the grant is available for all crops that are ready for the operation(s) but applicants must obtain written approval from SPGS before they carry out the operation(s).

Q. If I acquire more land can I claim SPGS support? Maybe: this will depend on a). your performance to date and b). the performance of other clients (as this determines how much grant can be reallocated). Always put it in writing for SPGS to consider.

SILVICULTURE

Q. Is SPGS addressing the huge seed need over the coming few years? The supply of quality seed is going to be the biggest challenge over the next few years and SPGS will give it top priority.

Q. What happens when a nursery supplies us with poor quality seedlings? If you clearly specified the seed origin and seedling quality and they don't deliver, then don't pay them. Nurseries will never improve on quality unless customers put pressure on them in this way.

Q. Are the reports true about the negative effects of pines and eucalypts on the environment? Much of the bad press is based on ill-informed 'pseudo-science' and not on fact. Much research has been done around the

world to prove that when properly planned, commercial tree plantations do not have a negative effect on the environment. SPGS responded to such criticism by writing an article published in the New Vision in Oct.'09 see <http://allafrica.com/stories/200911030066.html>

TRAINING & RESEARCH

Q. What training does SPGS offer? Once the new staff are in place (and conditioned to the 'SPGS way'), we will soon be stepping up the practical training courses which worked so well over the last few years (see p.20 for planned courses early in 2010).

Q. What is SPGS doing about pests and diseases? SPGS will soon be supporting major R&D projects targeted at current and potential threats to the plantations: also an important workshop on pests and diseases is being planned (in conjunction with University of Pretoria's FABI and Makerere University) in April 2010 (see p.20).

INVESTMENT

Q. What rates of return can I expect from my tree crop? This depends on many factors e.g. the yield/growth rate, location, quality and the market price at the time of harvest. An SPGS study in 2005 estimated a RoR of 10-14% with pines, more with eucalypts: the report by LTS International is on www.sawlog.ug

Q. Can I get insurance for my plantation? At present insurance is prohibitively expensive. Growers are advised to rather invest in ways in making one's plantation safer (see Tree Planting Guidelines' Chapter 16).

Q. Do SPGS have guidelines on valuation of plantations for sale purposes? Not right now though this area has already been scheduled for a study in 2010.

NB. **SPGS Frequently Asked Questions** booklet (version 5 no less!) has more detailed answers to most of the questions we are regularly asked by growers and visitors. It is free from SPGS office or download at www.sawlog.ug Additionally the answers to many of the silvicultural questions often asked can be found in the SPGS's **Tree Planting Guidelines** (see p.20). Keep abreast of all SPGS's activities from *SPGS News* and increasingly through our web-site.

FOUR-LEGGED WEED-EATERS



by Johannes Mokwena, Global Woods



Just don't mention mint sauce to them.

Sheep and goats have been used for centuries to provide humans with food and fibre. However, in more recent times, these species of small ruminants are being looked at increasingly for their ability to accomplish a variety of land management objectives, which benefit not only man, but also the environment.

Weed control is undoubtedly one of the most costly activities in managing planted forests as it normally extends over a long period. There are, however, interventions that could help deal with this. One way is through the use of what is termed "prescribed grazing." Prescribed grazing is nothing more than using grazing animals - in this case sheep - to manipulate forage in such a way that we can reduce the cost of weed control. Prescribed grazing can further be used for reduction of the incidence of wildfires and nutrient competition in forest plantations.

Early in 2007 Global-Woods (in Kikonda, near Hoima) undertook a trial with both goats and sheep to ascertain which would suppress the weeds better and also to see their impact on reducing the fuel-load inside a plantation. The results showed that generally sheep are better suited for the job compared to goats, mainly because goats tend to browse, climb on trees and wander around a lot, while sheep are calmer and graze through out.

For increase the effectiveness of sheep as tools for weed control and fuel load reduction, we devised a rotational system in Kikonda, targeting the plantation areas with heavy fuel load and weeds: each strata was at least three years old. Five strata were marked out for rotational sheep grazing. These strata were either fuel-load reduction areas or areas at the climax of weeding operations. Initially stocking per hectare was set at five sheep for two weeks but with more repetitive grazing it came more evident that the impact is greater when the entire flock is grazed together. The total stratified area is currently 300 ha.

We learnt that:

- If your area has vegetation exceeding one metre, slash it to help the sheep move around.
- Sheep tend to like pruned areas and those with closed canopy, this aids their easy movement and access. There are also a number of challenges that come with keeping sheep:
 - As animals, they occasionally get sick and the vet should normally be on standby for any call or even better arrange to have regular visits either weekly or monthly.
 - Forage becomes scarce during a prolonged dry season.
 - Water points should be located in close proximity to grazing areas to avoid long walking distances.
 - If you are leasing land from NEA a grazing permit or justification for using animals may be required.
 - Males should normally be grazed alone to avoid harassing the females during the active grazing day.
 - Once the canopy has closed, broad-leaved species normally not palatable to sheep tend to colonize the area.

Global-Woods to date boast about 600 sheep which started only with 15 sheep in 2007. Recently the sheep were also tried on young stands of 2 years where they did impressive work. During a tour of Global-Woods' operations in Oct.'09, the Minister of State for Environment, the German Ambassador and members of UTGA's Executive, were enormously impressed by the action of sheep in suppressing weeds. If managed well the sheep can save you two or three slashing operations, hence availing you the extra shillings you need in the early stages of your plantation establishment.

Johannes is a Forester with Global Woods. He studied forestry in South Africa and has worked in Uganda since 2007.

email mokwena@global-woods.com



Johannes measuring a rather impressive PCH stem at Kikonda, with the sheep munching away in the background.



WHY PEOPLE PLANT TREES

by Zainabu Kakungulu, Celia Nalwadda & Thaddeus Businge –SPGS Senior Plantation Officers

During the 4th Nov. 2009 meeting with our new clients, we interviewed a sample to seek their views about what inspired them to take on the business: this is what they had to say:



EVELYN NINSIIMA Evelyn is 26- yr old graduate in Environmental Management and is planting in Mafuga Central Forest Reserve in Kabale District.

Q: So how do you feel that your application has been approved for support?

A: I am really so excited about the offer. This means I will be able to plant more trees and expand my plantation. I have so far planted

150 ha and am planning 200ha in the next 3 years.

Q: What inspired you into doing business in Forestry? As a young woman I would expect you to either be running a jewelry shop or hair salon in town. Why Forestry?

A: Mine is a long and sad story but I derive my inspiration from my father. In the early 90's, my father owned a sawmill in Mafuga and a timber store in Kabale town. Even as a little girl I was his 'business partner'. He mainly supervised the sawmilling in the forest while I, together with my elder brother, ran the timber store during vacation. Business was booming and I am sure he never thought of any other business outside dealing in timber. Our entire livelihood depended on timber. But as fate had it, it wasn't long before the government put a ban on all harvesting, and there we were stranded with power saws but no where to get timber. That marked the end of our once lucrative business. My father was very frustrated, the business closed down, he had to start other businesses from scratch. Suddenly life changed. In 2006, I got to know of the land lease policy by NFA and that there was a tree planting grant from SPGS. I got land from NFA and immediately embarked on my journey of tree planting. My dream is to one time revive my father's once booming sawmill and see my self manage that timber store once more. This time with a more sustainable source of supply of the raw material. The SPGS support was very fundamental in helping me implement my project.

Q: How inspiring!! So what would you estimate your investment to be worth?

A: Am expecting a minimum of 300m³ per hectare at the time of harvest. The minimum going price for a cubic meter of wood is Ushs100,000. So with over 300ha, I am definitely a billionaire in the making. Tree planting has basically been a turning point in my life. I have lately discovered that there are many more opportunities to exploit. Kabale in general is a tourist destination for especially tourists going to Bwindi National Park, the hot springs and to Bunyonyi Crater Lake. My plantation is now the latest on the list of tourist attraction features. I receive about 200 visitors annually, mainly research students and NGO social workers earning me about Ushs 50,000 from each visitor. So am reaping my benefits already. **The sky is the limit for you. I wish you the best of luck.**



ALLAN MUGISHA, Business man and tax practitioner with Ernest and Young.

Q: How did you enter the tree planting business?

A: I am a business man so I'll grab any opportunity of a viable business within my reach. I got to know about the tree planting business through a colleague, Mr. Ponsiano Besesa, who has been into this kind of business for quite some time. He told

me about the SPGS and how I could get some financial and technical assistance for planting trees. With part of the costs of establishment to be covered by SPGS, it sounded a brilliant opportunity for me to venture into the business. The math was adding up and immediately I submitted my application for land to the NFA. I was offered 50ha in Kisombwa CFR in Mubende. I have so far planted about 20ha. I am planning to plant the remaining 30ha, and then another 50ha on my private land in Mbarara.

Q: So how are you finding the business so far?

A: Tougher than I thought it would be, but am determined to make it. There are still a lot of challenges e.g the costs of inputs like herbicides are going up, there's increased demand for labour and so labour is also becoming expensive. The SPGS grant is very timely.

Q: As a tax man, what can you say about valuation and taxation of forest business?

A: I think it's quite early to think about taxation at this stage, but it's important that we think about it anyway. Forestry is a relatively new business in the country and I am sure the tax bodies do not have in place any formulated guidelines for evaluation of plantations. But my advice to the growers is to keep proper records of all financial transactions involved in establishing a plantation. This guides you to at least estimate your expenditure so that if you wanted to sell your plantation at a particular time, you don't sell at a price less than the costs you've incurred.

Allan We wish you good luck and look forward to working with you.



JOHN SEREBE 73 year old retired civil servant and former administrator with Kampala City Council.

Q: Do you realize that you are the "youngest" guy around here today?

A: Laughs!! Oh yes, I have discovered the trick to staying young and energetic. Every 5 hectares I plant, I feel a year younger. That's why I look this young.

P.T.O

Q: So is it the fear of old age that you chose to plant trees so you could be young forever?

A: Well, if that was the case then I bet over 90% of your clients would be older than me. You realize people fear getting old as they get older. Anyway my main reason for planting trees is for commercial purposes and also for the environmental benefits trees provide: looking younger is a bonus from God. Tree planting - though a long term venture - is very profitable. The biggest problem that people have is that they do not think about future generations, they only think about themselves: the next generation can take care of themselves. This kind of thinking is what keeps many of us in the vicious cycle of poverty. So if you want to break this cycle, stop thinking about yourself, think about the next generation to come after you. This is what we call sustainability. I actually derive my inspiration from people like Madhvani and Metha who have built legacies. They may be no more but their legacy still lives. My desire is also to do the same for my children and hope that they will emulate me and do the same for their children as well. Timber business is good business, one can never go wrong.

Q: So how did you know about SPGS?

A: I read an article in the press way back in 2003. Unfortunately then I did not have the required minimum area of 25ha. But because of the interest and determination I had, I've since acquired more land and I've so far planted over 40 acres of good quality *Pinus caribaea*. SPGS technical support has been vital in ensuring the quality of my plantation. I am very proud of it. With the upcoming support from the SPGS, I am looking at expanding the acreage to over 100 acres.

WOODY NEWS



The 'Ghost tree' stumps in London's Trafalgar Square (Nov. 2009).

Ghost Trees

A UK-based artist, Angela Palmer, has gone to extraordinary lengths to publicize the impact of deforestation on climate change. She transported 10 tree stumps (roots and all) to the UK, where they were placed in the middle of London's Trafalgar Square for a week in Nov.'09. They were then taken to Copenhagen to make a dramatic point at the climate change convention. The stumps came from Ghana, which has lost 90% of its rain forests over the last 50 years. [see www.ghostforest.org/]

Teak Sawmill in Tanzania

Kilombero Valley Teak Company (KVTC) has invested US\$8.8m into a modern sawmill and wood processing factory to process wood products locally in Tanzania. The plant will add value to timber coming from KVTC's 7,800 ha teak plantations. KVTC's GM, Riaan van Wyk, commented that "I am happy that we have completed a processing industry in the same area that the timber was sourced". This modern sawmill, drying facility and value adding plant has created 110 jobs in addition to the 700 employed on the plantations [*The East African; Oct. 19-25th '09*].

BID NOTICE

UNDER OPEN DOMESTIC BIDDING

SUBJECT OF PROCUREMENT: Supply and delivery of three (03) station wagon vehicles, one (01) single cabin pick-up vehicle and one (01) double cabin pickup vehicle.

PROCUREMENT REFERENCE NUMBER: SPGS/SUPPLIES/0001/09

1. Sawlog Production Grant Scheme (SPGS) has allocated funds to be used for the Supply and Delivery of three Station Wagon Vehicles, One Pickup Single Cabin Vehicle and One Pickup Double Cabin Vehicle.
2. SPGS now invites sealed bids from eligible bidders for the Supply and Delivery of three Station Wagon Vehicles, One Pickup Single Cabin Vehicle and One Pickup Double Cabin Vehicle.
3. Bidding will be conducted in accordance with the open domestic bidding procedures contained in the Government of Uganda's Public Procurement and Disposal of Public Assets Act, 2003, and are open to all bidders from eligible source countries.
4. Interested eligible bidders may obtain further information from SPGS Headquarters and inspect the bidding documents at the address given below from **09.00 to 17.00** (local time) on working days.
5. A complete set of Bidding Documents (in English) may be purchased by interested bidders on the submission of a written application on the bidder's letterhead from the address below and upon payment of a non-refundable fee of US\$50,000 (Fifty thousand shillings only) cash to SPGS on Plot No 92 Luthuli Avenue, Bugolobi and obtain a receipt. It is upon presentation of this original receipt that the bidders will be issued the bidding documents. No liability will be accepted for loss or late delivery. Bids must be delivered to the address above by **20th January 2010, at 11.00**.
6. All bids must be accompanied by a bid security of **Uganda Shillings 11,000,000= (eleven million only)**. Late bids shall be rejected. Bids will be opened in the presence of the bidders' representatives who choose to attend at the address above on **20th January 2010 at 11:30**.
7. All clarifications in respect of this bid /bid opening, contact the Project Manager, SPGS.



FORESTRY CONTRACTING: EXPERIENCE FROM SOUTH AFRICA

by Charles Odeke (SPGS Plantation Officer) and Paul Jacovelli

Their very name tells you they mean business: Mhlambanyathi, meaning buffalo. Their business is forestry contracting and we were fortunate to have two of the main guys from **Mhlambanyathi Group Ltd** in Uganda for a period in November. **New Forests Company (NFC)** took the initiative after discussions with SPGS going back many months. We both had identified the urgent need to build up the capacity of our local forestry "contractors". The quotation marks tell you a lot because compared with the level of contracting in South African commercial forestry we realize that we really have a long way to go.

But we have to start somewhere and where better than hearing from the horses' mouth about the experiences of starting and managing what is now one of the main silvicultural contracting companies down south. Mafura Nkosi is the Group's CEO. He told us that he had started as a forest labourer in just 1992 and has risen to where he is now – namely, in charge of a company with a turnover of R5,000,000 per month and contracts to plant 5,000 ha in the current rainy season. Mafura was accompanied by Hans van den Berg, an experienced, practical contractor who oversees training in the company.

MHLAMBANYATHI'S GOLDEN RULES

1. Clear focus and direction.
2. Patience: you will not get rich tomorrow!
3. Perseverance: the journey to success has many 'pot-holes' along the way.
4. Cash-flow management.
5. Hard work by everyone in the Co.
6. Training and development: to keep abreast of new standards.
7. Push people to achieve: everyone in the team must do their part.
8. Recognition.
9. Respect for other stakeholders.

The SPGS had the SA contractors for two days before they went to review NFC's contracting operations. We made sure that we maximized the use of their time by requesting them to meet the 23 Ugandan contractors, who were attending the SPGS training course on *Business Management Skills* (the course was facilitated by Xavier Akampulira from Makerere University Business School). As the duo narrated their contracting experience, participants were particularly interested to hear the 9 Golden Rules that Mhlambanyathi has adopted (see text box). Rule 4 was emphasized as the 'king' of other rules without which everything else collapses.

"Our problem has really been on handling of business cash" lamented Fred Ahimbisibwe, a contractor for Quality Forestry Services Ltd. After discussing matters concerning financial discipline, many of the participants realized the importance of separating personal issues from those of the business. Regarding record keeping, Paul Ochom, a nursery contractor could not hide his joy: "with this knowledge, I can now keep proper records" he said. Akala Eric, the contractor for JC Forestry Ltd in Gulu added "at the very minimum I should now have a cash book to help track my cash flows".

The Mhlambanyathi group visited two local contractors - Brenda Mwebaze in Mpigi and Okurut Steven in Nakasongola - to get a better understanding of where we are (see photos opposite). They also visited numerous contractors working for NFC. SPGS hosted a roundup session

in Kampala before Mafura and Hans jetted back down South. They presented their main findings to an invited group of around 20 people and it certainly sparked some excellent discussion.



South African contractors - Hans (left) and Mafura – advising Heart of Gold Tree Ltd's Brenda Mwebaze. Brenda is establishing and managing a crop for Alvera Ngoga in Mpigi.

First we must clearly define standards so that quality and quantity are clear to everybody. A work study exercise is badly needed they said, in order to understand and improve productivity. Clear contracts are essential too, so that both parties are protected and these must include relevant legislation too. Contractors must also have a business plan that covers them for working throughout the year. They noted an urgent need for better training and supervision: "if you want to grow your business, grow your people" they told us.

SPGS will certainly take up this sound advice in the near future and work towards better supporting contractor development here in Uganda. We would like to thank New Forest Company for their support in this initiative and Mafura and Hans for their excellent advice.

PHOTO GALLERY I - LEARNING FROM RSA'S FORESTRY CONTRACTORS



→ Mhlambanyathi Group's Mafura Nkosi giving some practical advice to M&S Forestry's Stephen Okurut. Stephen is doing some establishment on contract for Apolot Mary in Kasagala CFR, Nakasongola.



← The South Africans were very impressed with the standards of establishment at Alvera Ngoga's plantation. Their main advice to Ugandan contractors, however, was on planning, budgeting and productivity matters.



→ Hans and Mafura advising Stephen and his Supervisor in field.





There was a good crowd at the Ministry of Finance on 13th October, 2009, to witness the signing of the Government of Norway's support to SPGS Phase II. Signing here are the Norwegian Ambassador Bjørg Leite (left) and GoU's Minister of Finance, Hon. Syda Bumba (seated, centre). Looking on (right) is GoU's Minister of State for Water, Hon. Jennifer Namuyangu and a gaggle of press people.



We spotted this beautiful bird of prey quietly scanning the horizon for rodents in Kasagala CFR, Nakasongola. The bird was perched on the only standing (just!) tree for miles around and it shows how valuable it could be to leave a few around when clearing land for new planting. By the way, we at SPGS are foresters not ornithologists, and we would appreciate any reader who knows what bird this is (see the zoomed-in photo). Some sort of Eagle we think (which is probably like saying 'some sort of eucalypt?' to a forester!).



EUCALYPTUS GRANDIS IN UGANDA

Brian Kingston



An impressive *Eucalyptus grandis* stem in Fort Portal, where the species grows extremely well (photo: P. Jacovelli).

1. THE SPECIES, ITS NATURAL; ENVIRONMENT & DISTRIBUTION

The first specimens of *Eucalyptus* known to the scientists of the western world were collected in 1770 by the botanist Joseph Banks and his assistant, Daniel Carl Solander, on the shores of Botany Bay on the east coast of Australia, during the first voyage of Captain James Cook to the Pacific Ocean.

Some of the most impressive and important forest trees of the east coast of Australia are

included in the "eastern blue gums", which include *Eucalyptus grandis* Hill ex Maiden, belonging to the family *Myrtaceae*. It has been variously called Rose gum, Flooded gum and Toolur in its native habitat and known as eucalyptus, *Eucalyptus grandis*, *Eucalyptus saligna* and Kalitunsi in Uganda. The species growing in Uganda was at one time commonly accepted as *E. saligna* or possibly a hybrid of *E. grandis* X *E. saligna*, however, it is now generally accepted as being *E. grandis*.

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- ... And Lots of Reviews

In its natural habitat this species reaches a height of over 45 metres, up to 55 m of which the clean trunk is of excellent form and up to two thirds of the total height with a rather open spreading crown. The trunk has a grey-brown, fibrous stocking of bark confined to the lower few metres and persisting as fairly regular small plates for 2-3 m, otherwise shed in long strips to leave a smooth powdered surface which is white, slaty grey or green in colour. The inflo-rescences are carried in axillary umbels on flattened stalks, each with 7-12 flowers with individual stalks being short or absent. Buds are pear-shaped, with bluntly pointed opercula 1.0 X 0.5 cm and usually with a white waxy coating. The fruits are also pear-shaped, slightly contracted at the rim, rather thin, being about 0.7 X 0.6 centimetres on short or very short stalks. The disc is narrow and depressed, valves thin, slightly projecting beyond the rim but incurved.

Seeds are very small, about 632 000 viable seeds per kilogram. Seedlings are 1-2 cm in height surmounted by two kidney shaped cotyledons up to 5 mm wide and 3 mm long. Juvenile leaves are produced alternately for 3 or 4 pairs then alternate, they are shortly stalked, oblong lanceolate, 3.0-6.0 X 1.0-2.5 cm, thin and slightly wavy. Adult leaves are alternate, stalked, lanceolate, slightly wavy, with a long point, 13.0-20.0 X 2.0-3.5 cm. These leaves are a glossy dark green above, paler below, thin and hanging both obliquely and horizontal. Veination is moderately conspicuous and regular, at 45°-55° to the midrib, and the intramarginal vein is distinct.

E. grandis is largely confined to a humid coastal strip on the eastern side of Australia from northern New South Wales into southern Queensland with two outlier occurrences in central and northern Queensland. The main occurrence lies between 26°-32°S from 0-300m altitude with the outliers at latitude 22°S below 300m in central Queensland and 17°S in northern Queensland at an altitude of 900m. In the southern part of its range it is found on river flats, creek banks and the lower slopes of deep fertile valleys and, especially in south eastern Queensland, it may occur in the edge of rain forest. In the more northern occurrences it ascends to tablelands. It prefers moist well drained deep loamy soils of alluvial or volcanic origin.



Fig. 1. Distribution of *E. grandis* in Australia.

This species grows in a climate which is mainly sub-tropical in a zone of summer rainfall with high humidities prevailing throughout the year. Annual rainfall is in the range 1000-1750 mm, falling on 75-100 days, with a dry season of 3 months which is rarely severe, having a mean monthly precipitation of 25 mm or more during this period, and annual evaporation of approximately 1000-1500 mm. Temperatures range from a mean minimum of 5-6°C to a mean maximum of 29-32°C with several frosts occurring away from the coast. *E. grandis* has proved readily adaptable to zones of uniform rainfall and of more severe drought conditions than those of its natural range.

2. INTRODUCTION AND DISTRIBUTION OF *E. GRANDIS* IN UGANDA

Uganda is a land without fossil fuel resources and depends to a large extent on the availability of wood as a source of energy for the majority of its domestic needs and some of its commercial activities¹. In the early days of the Uganda Protectorate's



Eucalyptus grandis growing in its native habitat in Queensland, Australia (photo: P.Jacovelli).

history little cause for alarm was foreseen or expressed that the supply of natural bush fuel was not sufficient for all possible contingencies. This state of affairs was not to last. The introduction of cotton, with its ancillary ginneries, the extension of the railway system from Kenya, each requiring woodfuel as a source of energy, the clearing of natural bush for the land for cotton crops, soon gave rise to a well-founded suspicion that some other source of wood fuel would have to be sought. Over a long period the situation was no doubt aggravated by the increased birth rate and declining death rate resulting from better medical services and facilities which gave rise in turn to land pressure not known formerly and a further clearing of the indigenous trees for food plots (Leggat, 1952).

In the annual reports of the then Scientific and Forestry Department for the year 1904-5 the following statement appears:-

"The time has now arrived to pay attention to afforestation. At present wood is the fuel of the country, and the development of industries, formation of railways, addition of steamers, all mean more fuel and timber, and the diminution of forest areas unless preventive measures are adopted."

The first specific mention of fuel plantations in Uganda appears in the annual report of the Botanical, Forestry and Scientific Department (1913) when recommendations were put forward and sanctioned that the further reservation of land was desirable to ensure the fuel supplies to the railway. In these areas it was intended that the growth of the indigenous species of trees would be

encouraged and it was also proposed that fast growing exotic tree species would be introduced for fuel purposes. Apart from raising exotics and ornamental indigenous species for township planting little further was done until 1915 when the Department started on a number of plantation projects and trials. These included an attempt to replant an area near Mutai in Busoga that had been cleared for railway fuel. *E. microcorys* possibly dating from this period was felled for sawmilling trials during 1959 in the Mutai forest reserve so it is possible that *E. saligna* or *E. grandis* was also planted during the same period.

Not until 1916 was there any intensive or planned planting carried out although during the period 1912-1916 various species of eucalypts had been introduced. The earliest introductions of seed were from Kenya, Nyasaland (now Malawi), New South Wales and South Africa, and it is probable that the present "race" of *E. grandis* comprises a mixture of all four "provenances", seed having been collected locally for many years since individuals within a single crop frequently exhibit marked differences in general appearance and even botanical characteristics. In 1915 the first importation of *E. saligna* seed is recorded and the seedlings produced from this seed planted in the Botanic Gardens at Entebbe, but the species appears to have been subsequently neglected in favour of other eucalypts, particularly *E. camaldulensis*, *E. robusta* and *E. tereticornis*.

By 1918, following the successful fuel plantings in Busoga, fuel planting also

¹This article was written well before Uganda struck oil in the Albertine Rift ca.2007.

started at Kampala and Entebbe. In 1921 Professor Troup, C.I.E., Professor of Forestry in the University of Oxford, visited Uganda and submitted a report to the Government which amongst a number of recommendations stressed the need for the preparation of management plans and for planting schemes. No further mention of *E. saligna* is made until the annual report of 1923 when it was planted in the Government Hill plantations at Entebbe although several *E. saligna* trees had been reported to have been planted in the felled areas of Nambigirwa forest. From 1926 onwards the various Local Governments began to take an interest in exotics as a form of fuel supply for rural and village areas and during the period 1926-1929 plantations were extended considerably with eucalypts, the seed of which had been obtained from roadside trees. It was probably during this period that Chiefs enforced the planting of a given number of trees per garden with corporal punishment for those individuals who neglected to plant or maintain the planted trees.

With the object of "the greatest good to the greatest number", planting proceeded apace under state control from 1926 onwards. It must be noted, however, that these efforts were mainly directed by administrative officers rather than technical officers, as the latter had yet to be brought up to full strength, and much of the peasant planting had been done under specific instructions through the Chiefs as had been done with other cash crops, notably coffee (Kiboko coffee). These operations resulted in plantations of mixed *Eucalyptus* species, which have in many cases given good yields of poles and fuel, but may not be entirely desirable from a forestry point of view. In the Buganda and Eastern Provinces, however, it was the rule to plant the accepted and favoured Uganda *E. saligna* under the direct control of trained Forestry Officers. As a result of these administrative actions where soil and elevation were suitable small rural *Eucalyptus* plantations were established at all Chief's headquarters, while the urban development of plantations was mainly the concern of the Forest Department.

For the first time a definite forest policy was set out in 1928 by J. W. Nicholson I.F.S., who had been appointed to advise the Uganda (and Kenya) Governments on their forests. This policy set out the need to meet such of the demands of the population as could not be met by individual and local administrative efforts, and to advise individuals and local native administrations in all matters appertaining to arboriculture or forestry. Consistent with these the State forests of Uganda were to manage to give the best

financial returns on the capital invested. A revision and amplification of this policy took place in 1948 but qualified it by directing that the satisfaction of the forest products needs of the people of Uganda must take precedence over export or purely financial considerations.

By 1929 *E. saligna* was the main *Eucalyptus* species being planted and in the annual report of that year is the first mention of its site requirements:-

"The main species planted were eucalypts, E. saligna (Blue gum of New South Wales) on moist land and E. robusta (Swamp mahogany) on wet land and swamps."



An old canoe builder who worked in the Entebbe plantations at the time of their establishment.

In this year the first working plan for the Namanve fuel plantations near Kampala was drafted and in the next two years further plans for the Kalume and Mpanga plantations near Kampala were completed. Little further was done until after the 1939-45 war, largely due to a lack of staff and the difficulty of planning far ahead during a war. During the period 1945-48 working plans were prepared for a considerable number of fuel and pole plantations. This effort continued and was completed in 1962 when the working plans for the Acholi and Lango fuel plantations were published. Up to 1974 all of these working plans were kept up to date by extension of their period of validity, issuance of a revised and updated plan, or preparation of a new plan.

With the adoption of the Development Plan for Uganda, 1946, and the recruitment of additional forestry executive staff, the

planting of Eucalypts received a further impetus along well planned lines, and its future development was defined as follows:-

"The requirements of fuel and building poles cannot be met from the main forest areas, but are best provided by plantations established in various parts of the Protectorate. The tree most suitable for this purpose is the eucalyptus, which is cut on a rotation of eight years. Experience with eucalyptus has shown that receipts in the ninth year more than cover the cost incurred during the preceding eight years. The trees are then coppiced and yield a steady revenue of about 3% per annum on the original capital expenditure. It is intended to develop these fuel and pole plantations at the rate of 440 acres (178 hectares) a year for eight years, the plantations being situated near Kampala, Fort Portal, Hoima, Arua and Masindi." (Worthington, 1946).

Pole and fuel planting continued to expand throughout the war years and by the end of that period nearly all the major centres were well served with plantations. Since then little new planting was done by the Protectorate Government but African Local Governments continued to establish plantations to serve rural communities. The main species planted have been *Eucalyptus* species and *Cassia siamea*. At first Red Gums (*E. rostrata* and *E. tereticornis*) and the Swamp Gum (*E. robusta*) were favoured but eventually *E. saligna* (*E. grandis*) predominated.

Prior to this statement of policy there had been planting close to Kampala since 1927 and the opinion held at that time, apparently, was that the better land should be reserved for agriculture and the wet or even swamp sites were suitable for *Eucalyptus*, which resulted in the choice of a planting area on marginal soils and papyrus swamps. With extensive artificial drainage and other aids, establishment was eventually achieved on this difficult site and by 1951 there were 960 hectares of *E. robusta*, 424 hectares of *E. saligna* and 12 hectares of the indigenous *Markhamia platycalix*. The *E. robusta* was planted in the swamps, which subsequently, in many cases, dried out sufficiently for this species to be replaced by the faster growing *E. saligna*. Much of this planting was carried out with seedlings raised from eucalypt seed imported from Australia. With the difficult establishment conditions and extensive drainage systems needed these plantations were expensive to establish and there is little doubt that to obtain the maximum financial return from a eucalypt plantation it must be established on the most suitable site available.

These plantations were established with the object of forming "a permanent source of

commercial fuel", Brasnett (1943).

Apart from sporadic attempts by Missions to establish plantations, it was a long time before private enterprises realized the dangers of the diminishing natural bush fuel supplies and the advantages of having their own exotic fuel plantations close to their commercial operations. Kakira Sugar Works in Busoga District was one of the first enterprises to realize both financial and utilitarian advantages of owning and controlling their own eucalypt plantations and as a result they began planting operations at Nsube Forest Reserve in 1944 with a 50 acre block (20.2 hectares) and by 1947 had established 393 hectares of very good *E. saligna* plantation.

Individual enterprise was encouraged by the distribution of eucalypt seedlings to farmers by local governments. The results from this varied greatly from district to district, there seems little doubt that any lack of enthusiasm for peasant planting would disappear with an ever increasing fuel and pole shortage. In West Nile District, for example, where rural populations had long had to be satisfied with the local grasses as a fuel, propaganda and education was expected to play a large part in this programme.

Uganda is a land of lakes with associated swampy valleys, ideal as breeding grounds for the malarial mosquito, and no account of the economy of the *Eucalyptus* would be complete without mention of its use in conjunction with anti-malarial works. In 1929 extensive afforestation of papyrus and other swamps at Tororo and Soroti was implemented with *E. robusta*, the Tororo plantations were also established with the additional objective of supplying the railway with fuel. On the whole these plantations have been expensive to establish and in many instances only partial success has been achieved. A noticeable feature of many of these plantations is that drainage channels were seldom extended beyond the limits of the plantation boundaries and consequently drainage water from the plantations backed up at its exit point causing flooding and frustrating the efforts of establishment in those areas. Indeed, it soon became apparent that the communities medical health objectives would clash with those of forestry when felling and extraction operations raised the water table and brought back a return of the malarial conditions. Average yields from these plantations have been low and swamp planting can not be considered an economic proposition despite the replacement of the *E. robusta* with the higher yielding *E. saligna* where changing site conditions made this feasible. It has been stated that "from the forestry viewpoint, anti-malarial plantations

are a very distinct liability and not an asset" (Forest Department, 1949).

The establishment of eucalypt plantations followed very closely the demand for woodfuel supplies by various industries. During and immediately after the 1939-45 war the East African Railways were the largest consumers of woodfuel and by 1952 all mainline locomotives had been converted to oil burning, woodfuel being used only on the western Uganda extension, although most of these supplies came from bushfuel, but this demand ceased in 1955. By 1950 most of the ginneries, jaggery factories and coffee processing plants had converted from woodfuel to oil. With the construction of the Owen Falls hydroelectric power station at Jinja in 1953 most industries converted to electricity and as a result created a specialised demand for transmission poles from eucalypt plantations. The sugar and tobacco curing industries have remained the major industrial users of plantation wood fuel.

To be continued (NB. The references will appear in final report, which will be available on SPGS's web-site when completed). – Ed.

About the Author: *Brian Kingston* joined the Ugandan Forest Dept. (UFD) in 1958 and retired in 1974 ("I was the last one out" – he tells us). During this period he served all over the country and finally as Senior Working Plan Officer in Entebbe. Brian authored many UFD Technical Notes, Management Plans and Site Classification studies. During his last few years in Uganda, he started writing up all the research information he had at the time on *Eucalyptus grandis*. His report is seeing the light of day for the first time here in SPGS's HeartWood. We are grateful to Brian for this fantastic contribution to the 'new wave' of tree planting currently underway here in Uganda. It certainly makes fascinating reading and much is still relevant today.

Addressing the challenges of a changing environment through a breeding programme for pine hybrids: A note on reported survival in *P. tecunumammii* provenances and hybrid development.

Cyndi Snedden & Karen Eatwell

The Council for Scientific and Industrial Research (CSIR) Forestry research team is collaborating with stakeholders in the forestry sector to develop novel pine hybrid germplasm that will address the challenges of a changing environment. The hybrid breeding programme aims to exploit the opportunities and challenges of hybrid breeding to develop pine hybrid germplasm that is well suited to grower sites, has improved survival and disease tolerance and produces a high quality product. The development and breeding of pine hybrids has been identified as a priority of a consortium known as the Pine Platform breeding collaboration. The Pine Platform members have recognised the potential of hybrids to deal with the challenges pine growers face – notably those of severe disease threats (e.g., *Fusarium*), climate change, increased fire risk events, pests (insects such as Sirex, and baboon for example), a stagnant and even shrinking forestry land base and demand for timber of specific wood quality.

The demand for the *P. elliottii* x *P. caribaea* hybrid is growing due mainly to its high survival in field, superior performance over pure *P. elliottii* as demonstrated in field trials and the combination of the rapid growth rate of the *P. caribaea* with acceptable wood properties (wood density comparable to *P. elliottii* and resin streaks potentially reduced compared with *P. caribaea*) (Snedden *et al.*, 2003; Kietzka, 2002; Stanger *et al.*, 1999, Snedden *et al.*, 1998; Malan, 1995; Van der Sijde and Slabbert, 1980; Van der Sijde and Roelofsen, 1985). However, there are a number of other pure species that the CSIR and York Timbers have identified and initiated breeding with that may have potential in hybrid combination, particularly for areas where *P. patula* is currently planted. Many of these are highly experimental but background investigation on the parent species growth and wood properties, disease tolerance, climate niche and adaptability suggest that there will be potential in hybridising a variety of species (Snedden *et al.*, 2007).

The implementation of a pine hybrid breeding strategy by the Pine Platform is associated

with and underpinned by ongoing research on the pure species and hybrid performance, genetics, wood properties and fecundity. The challenge of improving survival is at the forefront of the breeding research and is being addressed through a multifaceted approach. While there can be no doubt of the role and influence that silvicultural practices have on survival, the pine breeding programmes are in a key position to impact on improving the survival of pine trees in the field through the provision of genetically improved material that is well suited to the planting environment.

P. tecunumanii is a potentially important hybrid partner and there is some evidence in the literature to indicate that low elevation *P. tecunumanii* sources have higher survival compared with high elevation sources. The provenances of *P. tecunumanii* are divided into two groups according to their native environment. The high elevation sources occur from 1500 to 2900 m altitude and the low elevation sources from 450 to 1500 m (Dvorak et al. 2009b). CAMCORE identified the following low elevation provenances to be best performers in their studies: Villa Santa, Honduras, San Rafael del Norte and Yucul, Nicaragua (Dvorak et al. 2000 cited in Dvorak et al. 2009b). Provenances that have performed well in South Africa are Culmi, Yucul, Villa Santa and San Rafael (Nel et al. 2006).

The following advantages have been identified for *P. tecunumanii*:

- has good drought resistance (better than *P. patula*) in the years following establishment, (Hodge and Dvorak 1999; Dvorak et al. 2000; Snedden et al. 2007)
- higher productivity than *P. patula* in areas where there are not frequent frosts (Hodge and Dvorak 1999; Dvorak et al. 2000; Snedden et al. 2007)
- higher productivity than *P. elliottii* at lower latitude, warmer and drier sites in the highlands of southern Africa (Dvorak et al., 2000, Snedden et al. 2007),
- evidence of higher wood density than *P. patula* in South Africa (Snedden et al. 2007),
- more resistant to *Sphaeropsis sapinae* in Southern Brazil,
- has moderate to high tolerance of pitch canker (*Fusarium subglutinans* f. sp. *pini*) in screening tests of seedlings (Hodge and Dvorak 1999; Dvorak et al. 2000; Snedden et al. 2007),
- easy to propagate by seedling cuttings (Hodge and Dvorak 1999), and

- hybridises with a number of other closed-cone pines and some temperate pines (Hodge and Dvorak 1999).

In South Africa, early growth on most sites planted was promising and certain provenances and families grew up to 20% faster than the commercial controls of *P. patula* and *P. elliottii* (Dvorak and Donahue, 1992 cited in Parfitt, 1994). *P. tecunumanii* has been identified as a potential hybrid partner and successful hybrids have been made in South Africa between *P. tecunumanii* and *P. elliottii*, *P. taeda* and *P. patula* (Snedden



Pine hybrid 'mother' plants (*P. patula* x *P. tecunumanii*) are being increasingly used in commercial forestry: this is in York Timbers' nursery, RSA (photo: P. Jacovelli).

et al. 2007). Early results from a trial (CSIR trial 1010803PF0019 at Weza plantation) with these hybrids and the pure species in South Africa show that the *P. patula* x *P. tecunumanii* hybrids perform well in terms of volume when compared to the pure species parents and other pine hybrids (ranked 6th out of 30) (Snedden et al. 2007). Nel et al., 2006 have also reported the good potential of *P. patula* x *P. tecunumanii* hybrid in South Africa.

Seedlings from seed of *P. tecunumanii* low elevation sources below 1500 m have been found to have high resistance to pitch canker compared to only a moderate resistance in seedlings from high elevation seed sources above 1500 m (Hodge and Dvorak, 2007). In

a study by Hodge and Dvorak (2000) where 23 species (covering different geographical races) were screened for resistance to pitch canker, it was found that low elevation *P. tecunumanii* and other closed cone species (*P. oocarpa* and *P. jaliscana*) had very high resistance to infection. The percentage live stems of low elevation *P. tecunumanii* can be as high as 88 % compared to less resistant species such as *P. patula* with only 15% live stems (85% stem kill) and high elevation *P. tecunumanii* with 41% live stems (Hodge and Dvorak 2000). Hodge and Dvorak (2000) found those taxa that had the highest levels of resistance included *P. oocarpa*, *P. jaliscana* and *P. tecunumanii* (low elevation) with percentage live stems ranging from 88% to 97% and high frequencies of undamaged trees ranging from 80% to 92%. The low elevation *P. tecunumanii* provenances included in the study by Hodge and Dvorak (2000) were Culmi and Locomapa, Honduras and San Rafael del Norte, Nicaragua. Similar results for the variation in pitch canker resistance were found by Dvorak et al. (2009a) for low elevation *P. tecunumanii* compared to high elevation and other species such as *P. patula*. According to Dvorak et al. (2009a) the low elevation *P. tecunumanii* provenances of Sacul Arriba, San Esteban, Villa Santa, Yucul, Cerro la Joya and La Rinconada are all considered as resistant to pitch canker relative to their species means.

This evidence from the literature supports the claim that low elevation *P. tecunumanii* sources have higher survival compared with high elevation sources and this is an important consideration for the breeding of hybrids with this species.

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About the Authors: *Cyndi Snedden* is senior scientist in the Tree Improvement research at CSIR. Cyndi studied B. Sc. Forestry at Stellenbosch University and M.Sc. Genetics at Pretoria University. She has been involved with pine and eucalypt breeding at CSIR since 1996 and is passionate about the development of improved trees that will meet the challenges facing plantation forestry and the environment. **When we read this last sentence, how could we not publish the article? – Ed.**

Karen Eatwell has worked at CSIR since 2001 also working on pines and eucalypt breeding. She has a B.Sc. Agric and M.Sc. Genetics from Pretoria University.

CSIR stands for the Council for Scientific Research. Its Head Office is in Pretoria, RSA. CSIR receives 40% of its funding direct from government and has to generate the rest through contracts with both public and private sector. We are grateful to CSIR's Dr. Felicity (better known as Flic") Blakeway for this article.

SUPER ABSORBENT POLYMERS¹

Lawrence Orikiriza, Hillary Agaba, Mnason Tweheyo, Gerald Eilu, John Kabasda & Aloys Hüttermann.

Introduction

Water is the most important soil physical factor that affects plant growth and quantification of such growth (e.g. height,

biomass) is relevant for the understanding of the plant-water relationship. Roots conduct water, nutrients, provide mechanical support to plants and are the primary sensors of

water stress. Roots are dependent on shoots for carbohydrates as shoots depend on roots for water and nutrients. Optimum growth of plants depends on an efficient balance in the functions of roots and shoots. A developed root system determines plant growth and survival in any soil type because rapid root development enhances lateral and vertical access of water in the layers of soil. The use of hydrophilic polymer (hydrogel) amendments is one known method of supplying additional water to plants (e.g. by increasing the stored water in the root zone for use by the plant.

Hydrogels maintain a conductive soil environment that facilitates water and nutrient absorption for plant root and shoot growth in periods of water stress. The highly cross-linked polyacrylamide hydrogels (Super Absorbent Polymers (SAPs)) that can absorb and hold up to 400 times their weight of water aid tree establishment in various media including degraded and polluted soils where water retention and root development are reduced.

Hydrogels have been shown to favour good tree root development and improve root



Applying AquaSoil (a commonly used polymer) at planting in RSA. Most commercial forestry companies apply the product routinely at planting (photo: P. Jacovelli).

¹ This is an abridged version of the paper submitted: the full paper (with references) is available from SPGS on request.

growth during water stress conditions. It has been shown that hydrogels also increase root growth under saline conditions. Experiments on the effects of hydrogels on plant growth indicate increased shoot biomass in terms of root collar diameter, height and number of leaves under water stress conditions. It was found for the Hot-Dry Valleys in Yunnan, China, that several tree species had higher growth in hydrogel amended soils. Increased root growth of *Photinia fraseri* plants in hydrogel amended media was shown during irrigation. Increases in growth were also reported in citrus seedlings grown in well watered hydrogel amended sand soil. Hydrogel induced plant growth under water stress conditions in sand, sandy loam and loam soils has been demonstrated for several tree species.

However, the effects of SAPs on the biomass of a wide range of tree species in soils and different particle sizes has not yet been comprehensively studied under non-water stress conditions. In this study, the effects of different levels of hydrogels on the root and shoot biomass of nine different tree species growing on five different tropical soils under non-water stress conditions has been investigated.

Materials and Methods

Seedlings of four month old *E. grandis* (Blue gum), *E. citriodora* (Lemon scented gum), *P. caribaea* (Caribbean pine) and *Araucaria cunninghamii* (Hoop pine), three month old *Grevillea robusta* (Silk oak), five month old *Melia volkensii* (Melia), *Azadirachta indica* (Indian neem), *Maesopsis eminii* (Musizi) and *Terminalia superba* (Limba) were used. These species were selected based on their availability, fast growth, environmental and commercial value, both on farms and large scale forest plantations. The seedlings were obtained from the tree nurseries of the National Forestry Authority and National Forestry Resources Research Institute in Uganda.

Five soil types; sand, sandy loam, loam, silt loam and clay were used. The soils were mixed with three levels of Luquasorb hydrogel (manufactured by BASF SE, Germany) in a randomized factorial design with 15 treatment combinations. The three hydrogel levels used were; no hydrogel added (control), 0.2% w/w hydrogel and 0.4% w/w hydrogel.

For each species, 15 seedlings of each of the three amendments were harvested at the end of the 8 week period and separated into roots, stems, leaves and twigs. The data was analyzed using analysis of variance (ANOVA).

Results and Discussion

Effectiveness of Hydrogel Levels

Incorporation of either 0.4 or 0.2% hydrogel significantly increased the biomass of roots, stems, leaves and twigs of nine tree species (*E. grandis*, *E. citriodora*, *P. caribaea*, *Araucaria cunninghamii*, *Grevillea robusta*, *Melia volkensii*, *Azadirachta indica*, *Maesopsis eminii* and *Terminalia superba*) in sand, sandy loam, loam, clay and seven tree species (except *M. eminii* and *T. superba*) in silt loam soils, respectively more than the control. The effect of hydrogels on biomass growth was not only influenced by the differences in properties of the hydrogel levels, but also tree species specific soil requirements for their growth. Such hydrogel induced growth has been reported so far only for citrus seedlings grown in well watered sand soil.

Comparing the hydrogel levels, 0.4% displayed the best growth effects in sand, sandy loam and loam soils for *E. grandis*, *E. citriodora*, *G. robusta*, *M. eminii* and *T. superba* more than 0.2% hydrogel. 0.2% hydrogel showed the best growth effects for *Azadirachta indica* in sandy loam, *P. caribaea* and *T. superba* in silt loam. Each of the hydrogel levels displayed best growth effects in four tree species potted in clay soil.

Economic Considerations

In afforestations, between 20 and 40 g of hydrogel is given per tree into the plant hole. With a tree number of 1600, this amounts to 32 – 64 kg per ha. One kilogram of hydrogel will cost between \$2-4 depending on the country where it is sold. The cost of the machinery for the application of hydrogels during the planting of trees is low. In our field experiments we had no trouble in converting conventional planting machines in such a way that the desired amount of hydrogel was applied to the plant holes. Thus, the maximal price per hectare would be about \$250.

If one compares this value with the typical costs for afforestations around the world (Austria: 3500 \$/ha, Canada: 1750 \$/ha, China: 90 \$/ha), a hydrogel induced twofold growth increase would raise the internal rate of return considerably (Australia: from -6.6 to -3.8%, Canada: 5.1 to 15.5%, China: 41 to 65% (authors calculation)). Thus, it is very profitable to also apply hydrogels in afforestation where the survival of the planted trees is not a major problem.

In conclusion, hydrogel amendment clearly increased the biomass of the nine tree species potted in the five soil types. This effect should be exploited both in tree seedling production in the nursery and in afforestation.

Acknowledgements

The authors thank the KAAD (Katholischer Akademischer Ausländer Dienst, Bonn, Germany), the BASF SE, Chemical Company, Ludwigshafen, Germany and Makerere University Graduate School for funding this study. Special thanks is also given to the anonymous reviewers.

SPGS also thank Mnason Tweheyo for permission to publish this article. Mnason is a Professor at Makerere University's Faculty of Forestry: he is also an enthusiastic SPGS client and tree planter.

E. tereticornis and Lessons From India

Evan D. Shield

Introduction

There is some dispute about its authorship, but there is no dispute about the meaning of the saying that "Nothing is certain but death and taxes". I think that powerful declaration of uncertainty has relevance to the plantation-based forest sector, especially in terms of product policy (for example, what to plant and for which market).

Immediately, it should be noted that current markets are of relatively little value as indicators of product policy for a plantation newly established today. The volatility of markets - especially over a rotation length of 10 or 20 year - is assurance of that. Moreover, it seems inevitable that technological developments must continue to truncate product life-cycles. Thus, products in demand today may become increasingly irrelevant within the time frames mentioned. Certainly, I have witnessed such changes in the 50 + years since I began my career in this sector. In an Australian - and, therefore, a eucalypt - context, perhaps there are no better examples of rapid change than the dramatic reductions in eucalypt lumber usage for:

- fruit cases (a market now strongly dominated by paperboard and polystyrene) ;
- concrete form-work (a market now strongly dominated by steel, LVL and plywood) ;
- house-framing (a market now strongly dominated by mechanically stress-graded pine lumber).

Of course, no less dramatic has been the almost universal acceptance of eucalypt pulpwood over the same time span. Together with longer-established demand for fuel, demand for eucalypt fibre has promoted

establishment of a global plantation estate now likely to exceed 20 million hectares.

The Appeal of Natural Durability

Despite the lack of certainty, I have developed and continue to maintain an increasingly strong conviction that durable hardwoods have a secure future. This is because:

(a) treatment of wood (roundwood and/or lumber) with preservative chemicals seems to be encountering increasing social and even political resistance. This is especially true when children may come in contact with that wood or that wood is associated with supplies of human food or drink. Indeed, it may be possible that - in some markets at least and under some certification schemes - designation of a food or drink as organic is impossible if its production is associated with wood treated with preservative chemicals;

(b) increasingly, evidence is accumulating that treatment of wood with preservative chemicals is not as effective as was previously believed. For example, in treated plantation roundwood of *E. grandis*, heartwood is impermeable to Copper Chrome Arsenate (CCA) preservative at normal application pressures. In use, this roundwood almost inevitably develops deep radial splits which expose the untreated heartwood to fungal infestation, most likely as a result of spores being carried into the crevices by rain-water. Moreover, based on South African experience, it is now established that urea fertilizer has the effect of negating the anti-fungal efficacy of CCA preservative. In each case, expensive, pre-mature replacement of post or pole becomes necessary;

(c) it appears that global markets for outdoor structures are promising. There is a wide range of product types within the outdoor structures portfolio, with decking the more dominant one⁵. For reasons very similar to those detailed above, use of naturally durable roundwood and/or lumber seems preferable to preservative-treated materials. This is especially true when that natural durability is verified by a reputable standards system as being of the highest classification;

(d) concerns that global warming is causing or will cause damaging rises in sea-levels has prompted renewed building of containment structures, especially in Western Europe. This has created a substantial demand for piles from species with a high heartwood durability rating in a marine environment, a very demanding requirement.

(e) within developing economies, there is a huge unsatisfied demand for basic services. One of these is supply of electricity for domestic and smaller-scale use (for example, powering pumps for small-field irrigation). In

these circumstances, it is not unreasonable to anticipate demands for transmission poles and cross-arms to grow to the extent that their intercontinental trade becomes routine. Again, I believe that the in-service superiority of poles and lumber of species with naturally durable heartwood will prevail, even against a lower cost alternative.

While uncertainty must apply again, the following table - extracted from Australian Standard 5604-2005 - gives some indication of the natural heartwood durability potential of those Eucalypt species which might be considered as candidates for regional plantation projects built around a durable hardwood product policy. Uncertainty arises because of the substantial danger in any assumption that heartwood from younger plantations trees will achieve the same classifications as that from substantially older native forest trees on which this Australian Standard is based.

Table 1: Natural Heartwood Durability Classification for Selected Eucalypt Species with Plantation Potential According to Australian Standard 5604-2005

Species	Natural Durability of Heartwood		Marine Borer Resistance of Heartwood (in Southern waters of Australia)
	In-Ground	Above-Ground	
<i>cloeziana</i>	Class 1.	Class 1.	Not recorded
<i>microcorys</i>	Class 1.	Class 1.	Class 3.
<i>propinqua / punctata</i>	Class 1.	Class 1.	Class 2.
<i>tereticornis</i>	Class 1.	Class 1.	Class 2.
<i>camaldulensis</i>	Class 2.	Class 1.	Class 2.
<i>citriodora / maculata</i>	Class 2.	Class 1.	Class 4.
<i>pilularis</i>	Class 2.	Class 1.	Class 3.
<i>resinifera / pellita</i>	Class 2.	Class 1.	Class 2.

Eucalyptus tereticornis – a Class 1 Heartwood durability hardwood with strong potential.

I think that Table 1 indicates the substantial potential of *E. tereticornis*. The species is a common one throughout this region and, notwithstanding the absence of genetic improvement and of even rudimentary silvicultural management, it can be demonstrated not only to prosper but also to under-write a significant level of rural activity.

Within a “trees-on-farms” concept, *E. tereticornis* can make a substantially greater contribution than the important one already held. For this to be achieved, three integrated activities appear necessary: (a) a program of genetic improvement with clonal propagation as an unambiguous objective; (b) a radical regime of silvicultural management for sawlog production incorporating improved pasture co-cropping and (c) a market development program to seek out higher-value opportunities for roundwood and lumber of *E. tereticornis*.

With the web-site of Pragati Biotechnologies (www.eucalyptusclones.com) providing the inspiration, I decided that even only the first of these activities demanded my visiting India. The fact that this web-site and, additionally, many literature sources made reference to Indian small-holders integrating cultivation of eucalypts with several other food or fodder crops was also an important motivation.

According to <http://git-forestrv-blog.blogspot.com/2008/09/eucalyptus-global-map-2008-cultivated.html>, in 2008, India had close to 4 million ha of eucalypt plantation (giving that country global leadership) and several sources indicated that *E. tereticornis* (or Mysore Gum as it is known there) was strongly dominant with a very wide geographic distribution. Moreover, *E. camaldulensis* was also common, while, in the South, *E. grandis* and *E. globulus* were present in commercial plantations. However,

according to one estimate, the two “colorado” species and their hybrids may constitute as high a proportion of the total eucalypt plantation area as 90%.

India

This is a large and, to me, a fascinating country: a vibrant democracy with over 1,000 million people and, now that it has been largely released from the long-term strictures of political and bureaucratic controls, a booming economy (even in these depressing times). However, it is also a hot country and, seasonally, very dry. Climatic data would indicate the majority of the country to be reasonably well-watered. However, the seasonality of rainfall results in many parts of the country being no better than semi-arid. For example, each year, Bhopal has a period of eight months (October-May) during which no individual month has a mean rainfall of greater than 20 mm. In other words, 92% of the MAP occurs in four summer months (June-September) when the South West monsoon is active.

Eucalypts emigrated to India soon after European settlement in Australia. One report suggests it may have been as early as 1790 when, it is claimed seed of 16 species were received from the then infant colony at Sydney Cove. Perhaps as many as 170 species have been introduced since. However, given the seasonal aridity of much of the country, it is not surprising that the “colorados” are now so strongly dominant.

Shifts in public policy and the private sector's insatiable wood demands resulted in a turbulent environment for the forest sector in the past. In particular, in the 1980s, India experienced what was perhaps the most strident of anti-eucalypt campaigns. Analysis of that situation - by Indians and foreigners alike - seems to permit the conclusion that the fault lay not with the eucalypts per se, but rather with the strategic and methodological framework within which their planting was promoted. Certainly, in the current environment, agitation against the eucalypts appears to have subsided.

The National Forest Policy, promulgated in 1988, not only imposes remarkably severe limitations on wood harvests within public forests, but also "enjoins wood-based industrial units to meet their future raw material requirements through developing partnerships with farmers". A strong incentive for industry to conform is the fact that India has statutory limitations on the size of agricultural land-holdings.

It is difficult to escape the impression that, without clonal propagation, there would have been no prospects for success in this new approach to expanding the plantation sector in India. Only clones appear able to achieve the growth rates necessary to provide sufficient incentive to farmers to participate in these partnerships. According to Piare Lal, the "average productivity of commercial clones is about 20 - 25m³ ha⁻¹ yr⁻¹ and many farmers have achieved 50m³ ha⁻¹ yr⁻¹". Unstated here is the probability that higher growth rates require irrigated sites.

While it is only proper to recognize the substantial progress made with clonal propagation and hybridization of the "colorados" in India, it is also important to acknowledge that highly impressive research efforts are also directed at improving the (chemical) pulping properties of *E. tereticornis* and its hybrids. In particular, the new laboratories of ITC limited on the out-skirts of the city of Hyderabad have a most impressive range of relevant projects, no apparent shortage of modern, high-technology equipment, expert staffing and promising - however, preliminary - results.

As yet, silvicultural management of the clonal plantations of *E. tereticornis* has not received significant attention. The trait of self-pruning is an integral part of the selection process. However, artificial pruning is not practised. Similarly, while establishment spacings are

chosen with the requirements of the co-crop taken to account, no thinning intervention is undertaken to promote diameter growth. For pulpwood product policies applied to irrigated plantations, some clonal and/or hybrid *E. tereticornis* plantations may be harvested under rotations as short as three years. However, longer rotation lengths are accepted for other product policies such as that concerned with the production of small sawlogs. There is almost universal co-



E. tereticornis growing in Queensland, Australia. Such impressive specimens provide a good source of breeding material (photo: P. Jacovelli).

cropping practice. In Punjab state, wheat was seen to be the dominant co-crop. However, others - particularly pulses, mustard and citrus - were common there.

The Indian forest sector appears to be well-served by research institutes. Apparently, public policy at a national level favours autonomous institutes. For example, in Coimbatore (Tamil Nadu), the national efforts in tree improvement are performed by the Institute of Forest Genetics and Tree Breeding, while Jhansi (Uttar Pradesh) is the home to the National Research Institute for Agroforestry.

In Punjab, where there is only limited influence by pulpwood companies, it is common for farmers to sell wood on an open-market system. This system depends on wood depots located at intervals along major highways. These depots - each

equipped with a weigh-bridge - represent markets where both buyers and sellers operate.

Conclusion

India has a long history of public-sector forest research. Within the framework of the National Forest Policy and the establishment of autonomous forest research institutes - both relatively recent developments - forest research now has a stronger focus on the plantation sector. In addition, the private sector can claim, properly, to have made substantial contributions. This is particularly the case in the context of developments in clonal forestry with the "Colorados". While large corporations - for example, ITC Limited - have made major contributions, substantially smaller companies - particularly Pragati Biotechnologies - have played important roles in ensuring wide geographic availability of clonal materials.

It seems reasonable to claim that, by providing the basis for a revolution in plantation economics, research-based clonal propagation has created new horizons for eucalypts in India. It will be most interesting to see if continued progress permits the industry to attain greater levels of self-sufficiency in their pulpwood raw material supplies. Similarly, greater levels of eucalypt sawlog / peeler production and utilization would be welcome developments.

Certainly, I consider India must be regarded as a prime source of improved "Colorado" germplasm for any plantation project in this region with either species. Utilizing the opportunity to access such germplasm from India would accelerate progress in such a project substantially. Additionally, India offers many lessons in co-cropping, the principles of which seem to have far wider applicability.

About the Author:

Evan Shield is an independent consultant, specializing in Eucalyptus management, utilization and marketing. An Australian by birth, he now resides in Argentina, having worked many years in Papua New Guinea and Australia. He is a vocal supporter of heavy, early thinning regimes to encourage 'free growth' in eucalypt plantations (see SPGS News No. 18).

DON'T KEEP IT TO YOURSELF!

Why not share your knowledge with other readers? We know that many of you out there - whether you are foresters, scientists, farmers or just interested in trees - have useful knowledge that could contribute to the cause.

It could be a research article, an observation from your tree-growing experience or something interesting you read. It doesn't have to be from Uganda either, as we have a growing number of readers overseas (or over borders anyway!) and we know there is much to learn from other countries with better developed forestry industries.

Many countries are looking at what is happening here in Uganda, especially with the impressive results being achieved by private tree growers. Remember what we always say at our SPGS growers' field meetings:

“Learn from each other’s experiences: there is no need to make the same mistakes as the past.”

Send your items (including digital photos wherever possible) to us at info@sawlog.ug or drop it into SPGS's Kampala office (see contact details on back page of *SPGS News*).

Don't forget to include a few lines about yourself too.

Working together we can do so much more.

REVIEWS

To Stimulate The Grey Matter...

Pine Clonal Forestry

The latest *International Forestry Review* Vol. 11 (3) has a very interesting article on pine clonal forestry in Southern USA – a region that has about 8% of the world's pine plantations (around 13m ha). Two choice quotes neatly sum up the importance the authors place on plantations and research:



“The need to grow larger amounts of wood fibre on smaller areas of land will become evident in the coming decades as population growth and human consumption continues to rise”.

“Tree breeding programmes are essential for the success of plantation forestry, for meeting the demand for wood, and for reducing harvest pressures on vast area of natural forests”.

The paper details the development of their pine clonal programme (largely based on loblolly pine, *P. taeda*), and discusses its implications in terms of economics and environmental issues. Clones cost 3-4 times a seedling but can achieve productivity gains of up to 50% in wood volume. Also discussed is the importance of good research and planning, especially testing the clones scientifically and ensuring a reasonably broad genetic base to reduce the risks of pests and diseases. The role of plantations in climate change is also noted, since fast

growing (and well adapted) cloned trees should grow faster than trees derived from conventional seed: they thus store more carbon over their lifespan.

Incidentally, the accompanying Commonwealth Forestry Association Newsletter carries a front page article on the SPGS's *Tree Planting Guidelines* as well as a very favourable review by FAO's Jim Carle. We encourage readers to join CFA by contacting Celia Nalwadda, who happens to be CFA's Youth Officer as well as SPGS Senior Plantation Officer: email celian@sawlog.ug

AIDS impact on Forestry and Renewable Energy

Southern Forests (vol. 71 (1) April 2009) has two articles that stood out: *“The prevalence of HIV and AIDS in forestry contracting businesses in South Africa”* by PM Basson *et al* and. It was estimated in 2007 that the number of forestry contractors in RSA was 32,000. With a HIV infection rate of 34% (in 2004/05, when the study was carried out), the first paper highlights the seriousness of HIV/AIDS on human resource productivity in the sub-sector. The authors stress that with such data on the prevalence rate, it is possible to anticipate the effects of HIV/AIDS in planning mitigation interventions to sustain the quality of life and maintain required levels of productivity (through a shift from labour to capital).

The other relevant article was *“Renewable energy: the potential opportunities and obligations of plantation forestry”* by B Talbot & PA Ackerman. This paper is very timely, as the global demand for biomass-based renewable energy places increasing pressure on land (and on tree plantation too in many countries). The authors highlight that over 2 billion people are dependent on woodfuel and with only a fraction of this is harvested sustainably, the need for highly productive plantation forestry is greater than ever. The authors discuss the implications for the South African forestry industry – from environmental, social and economic viewpoints. Thought provoking stuff indeed!

Charcoal in Tanzania

A 2009 report by the World Bank entitled – *“Environmental crisis or sustainable development opportunity? Transforming the charcoal sector in Tanzania”* – is timely, especially as charcoal production is one of the main drivers of deforestation in the whole of the East African region. The facts make sobering reading: 90% of Tanzania's energy needs are met from woodfuels. Dar es Salaam uses 500,000 T charcoal per year, which is around half of Tanzania's annual consumption. The bulk of the charcoal comes from unregulated harvesting of woodlands (up to 200 kms from the capital) and this is the crux of the problem, since charcoal-makers generally do not pay for the raw material and evade most licence and levy payments. The report notes that *“significant changes need to be introduced to regularize and legalize the current informal sector”*. Their recommendations sound perfectly reasonable - e.g. ensuring local authorities retain and reinvest revenues collected from the trade; introducing fiscal incentives that reward sustainable production of charcoal; drawing up (and implementing) harvesting plans and promoting fuelwood plantations and the use of fuel-efficient stoves. As so often, however, the problem comes in implementing such wide-ranging proposals. The complete reform of such an informal (although large) sector requires not just policy changes but a major commitment by the local and central government – something which the region has not seen to date. The report does, however, try to put a positive spin on matters by stressing the employment and income benefits such an overhaul could bring to the country. However difficult it may be, for the sake of the livelihoods of millions of poor people in the region, *‘something must be done’* (your reviewers' words) and this report is an excellent place to start a serious debate amongst those who can influence such matters. The report is available online from <http://forestconnect.ning.com/>

Sustainable Energy

The bargain of 2009 (book-wise at least) must be **Sustainable Energy – Without the Hot Air** by D. MacKay. Not only is it a hugely stimulating read but it is free. MacKay's book is dedicated "to those who will not have the benefit of two billion years' accumulated energy reserves" and starts off with a great quotation from renowned author James Lovelock:

"We live at a time when emotions and feelings count more than truth, and there is a vast ignorance of science".

Readers should not be put off by the fact that Mackay focuses largely on the UK's energy situation, since there is a vast amount that is highly relevant to everyone concerned about the depletion of fossil fuels and climate change. The author is clearly one of those rare creatures indeed, namely, a scientist who knows how to communicate with the general public. "We need numbers not adjectives" he says "and the numbers must be comprehensible, comparable and memorable". The book is written in plain English and is full of surprises too: here are just a few of his examples:

- In terms of energy saving, all the energy saved in switching off one's phone charger for one day is used up in one second of car-driving.
- To provide just 25% of UK's energy consumption by growing crops would require 75% of the country to be covered with biomass plantations.
- Roof-mounted, micro wind-turbines are an utter waste of resources but roof-mounted solar water heaters are a no brainer i.e. they really do work (even in the UK!).

Mackay goes on to explore various strategies for eliminating the gap between consumption and renewable production. Interestingly, he says that "any plan that doesn't make use of nuclear power or 'clean coal' has to make up the energy balance using renewable power bought in from other countries: the most promising is concentrating solar power in deserts". Amidst the minefield of confusing advice on sustainable energy, this publication is a breath of fresh air. The author is Professor of Natural Philosophy at the University of Cambridge and the book is available

free online at www.withouthotair.com

In the next *HeartWood* Review section, two brand new publications that certainly sound highly relevant to our commercial forestry development in Uganda, will be extensively reviewed: namely **Encouraging Industrial Forest Plantations in the Tropics** by ITTO (International Tropical Timber Organization) and **Planted Forests: Uses, Impacts and Sustainability** by Prof. Julian Evans. Kindly bring other publications to our attention so that we can review them for our growing (and increasingly knowledgeable, we have to



say!) readership.

SCIENCE FROM OXFORD

Professor Jeff Burley (until recently Head of the Oxford Forestry Institute) very kindly had donated many publications to the SPGS for safe keeping. These will soon be housed in our rapidly expanding library in our front office. On a first quick look through, the following titles stood out as being particularly relevant to what we are doing today in Uganda:

- ❖ Procedures for Monitoring Tree Growth & Site Change by P.G. Adlard.
- ❖ Provenance Variation in *P. caribaea*, *P. oocarpa* & *P. tecunumanii* by J. Birks & R. Barnes.
- ❖ Structure & Growth of Small Enterprises in the Forest Sector in S & E Africa by J. Arnold *et al.*
- ❖ Problems of Public Forestry & the Socio-Economic Implications of Privatisation by W. Hurditch.
- ❖ Biotechnology in Forest Tree Improvement by R. Haines.
- ❖ Diseases of Forest Trees Widely

Planted as Exotics in the Tropics & S. Hemisphere: Part I – Hardwoods; Part II – Pines by C. Gibson.

- ❖ Pulp & Wood Densitometric Properties of *P. caribaea* from Fiji by J. Burley & E. Palmer.
- ❖ Growing Stock Levels & Productivity Conclusions from Thinning & Spacing Trials in Young *P. patula* Stands in Southern Tanzania by P. Adlard.
- ❖ Small & Medium Forest Enterprise (discussion papers) from Uganda, Guyana, India, Brazil, China and South Africa – published by IIED.
- ❖ International Forestry Review – issues from the last 10 years.

We are very grateful to Prof. Burley for his generosity and hope these (and other) donations will encourage the new generation of Ugandan foresters to ensure that the tree planting going on today is based on a sound scientific footing. Visitors are welcome to access our library, though books will not be allowed off the premises.

HeartWood

COMING IN ISSUE 4:

📖 **The Benefits of Tree Plantations.**

📖 ***E. grandis* in Uganda (Pt II)**

📖 **Termites**



P.O Box 5244 Kampala.
Plot 92 Luthuli Avenue, Bugolobi, Kampala.
Tel. 0312 265 332/3.
Fax. 0312-265 334.
Email info@sawlog.ug
www.sawlog.ug

PHOTO GALLERY III



↑ Ugandan Forestry Contractors posing with SPGS's Project Manager, Allan Amumpe (2nd from rt) following the completion of their Small Business Management (SPGS Training course) in Nov. 2009. Madira Davidson (NED (U) on the extreme left took the book prize for the best score in the test. Well done to him!



← No, we are not advertising pine-flavoured pizzas but this photo (courtesy of William Davidson) shows brilliantly the enormous impact of late (or no) thinning in pines. Just look at how the growth slows down as competition sets in - after yr 6 here. This section is from an 11-yr old *P. patula* from the Tanzanian Southern Highlands. Thinning on time (whether there is a market or not for the thinned stems) is crucial for growing big trees in the shortest possible time period – which is, after all, what all commercial growers here should be keen on doing.

→ When we visited with the South African contractors, it was great to see someone taking our advice. This is Robert Nabanyumya's 6-yr old PCH crop in Kasagala CFR, Nakasongola. He had just undertaken a 1st thinning (to waste) but the remaining crop will greatly benefit from the space provided. Being Chairman of UTGA, however, Robert is now particularly keen to find markets for early thinning material and SPGS have agreed to fund a study early in 2010 on this very matter.



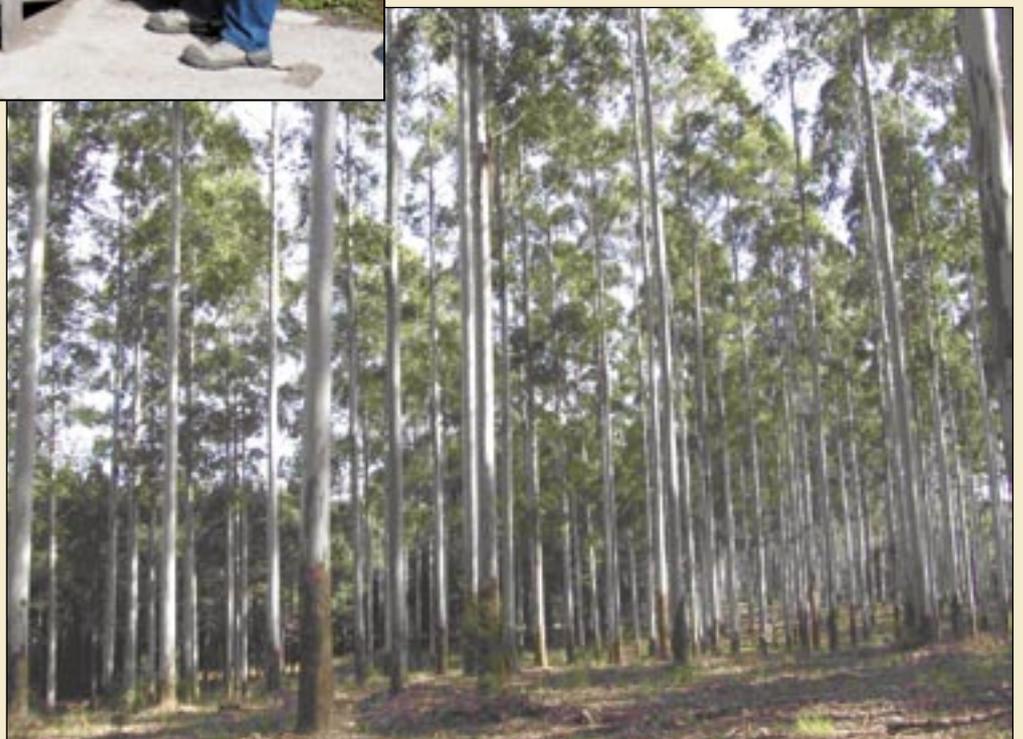


Members of Muzira Cooperative Society posing in front of their impressive pine plantation high up in the Bushenyi hills. SPGS's Charles Odeke is on the far right along with the ever-present community dog.



← *UTGA will be ably supported over the next 4 years by experienced Norwegian foresters from NORSKOG. On an advance visit in July 2009, SPGS's Paul Jacovelli went to check out their garden furniture designs. Campbell Day (NORSKOG, left), Oystein Aasaaren (NORSKOG, seated) and Jan Erik Studsrød (NORAD).*

→ *On the right sites and with good management (especially heavy, early thinnings), Eucalyptus grandis can produce a fine sawlog and pole crop – as this photo shows well. This is a 15-yr old crop at Rivera in Uruguay, with some trees measuring up to 57 cm dbh. Photo courtesy of Evan Shield (NB. see his article in the current HeartWood section).*



A New Direction for Community Support



by Charles Odeke, SPGS Plantation Officer

3.2 million seedlings to be planted by communities in 4 years! Yeah, or did I mean - Yes We Can? With the existing community seedlings demand of over 5 million seedlings submitted to SPGS plus the successful results from the previous community support, it is possible to expand community support but this time in a more focused manner – basing on SPGS commercial planting clusters. Over the past two months, new ideas regarding how best to provide SPGS community support to intended beneficiaries have been flourishing. We will be sharing these ideas with you only after quick flash-back.

In the Sept/October'09 season, 10 communities including three new ones (Nongo and Nsawo in Luwero and Masaka and Kisagala from Kibaale district) were supplied with 100,000 tree seedlings. This now brings the total number of seedlings supplied to 40 communities to date to about 800,000. Hoping all seedlings were planted and that at least 80% have survived, we would be glad to say 500ha have so far been planted. The quality of some of the community plantations will surprise many of you as it has us at SPGS. Trees are well looked after and are growing very well as seen on the photo opposite.

So what will be new in our community support in Phase II of SPGS? Previously we waited and then responded to applications for seedlings support. This approach resulted into supporting scattered communities as opposed to having them focused around SPGS clients. With the lean SPGS team, communities did not really get the amount of help they deserved. More so, community leaders and SPGS clients were not fully involved in assisting these communities plant their trees well.

In the Phase II, therefore, the targeted communities will be mostly those planting around SPGS's main clients. This is primarily meant to improve the relationship between the commercial tree growers and the local community. You will agree with me that some of the clients are planting trees on areas where they are not well known by the local community. The local community also needs to know and appreciate the kind of business that is being developed in their area! Giving trees to the local community to plant themselves is one way the two players will work together and appreciate each other.

Communities to be selected for SPGS support will thus be based largely on location, within the SPGS clusters (see FAQ v5 for map). A minimum of 20 members per village and the formal organisation of the community (CBOs) are preferred. In this approach, both the clients and community leaders are expected to have increased involvement in assisting communities grow their trees better. In this case, leaders of community planters will be identified and trained in basic organisation skills, how to manage a small business enterprise and extension work. In order to ease learning, tree planting skills, demonstration plots will be established and maintained within community planters.

There will also be need to reduce seedling transportation distance to minimise the associated stress and losses. Seedlings for approved communities will therefore be produced from selected nurseries in the clusters nearest to them. Inter-community, exchange visits will be periodically organised to enable community members to share experiences and learn

from the success or failures of others. Now you can already see that in order to implement the above described community activities, serious coordination effort from the SPGS will surely be needed. For that matter, one Plantation Officer (yours truly) is now fully dedicated to coordinate SPGS community tree planting activities. I will end here for the time being, but I welcome any ideas from you related to how the community tree planting initiative can best be done.

Email charleso@sawlog.ug or tel. 0312 265 332/3.



SPGS's Charles and Paul with community planters in Luwero.

Did You Know?

The Mau Forest Complex in Kenya, at 400,000 ha is the single largest block of closed canopy forest in East Africa. It encompasses vital catchment areas including the Mara River, which flows eventually into Lake Victoria. The Mau has been heavily encroached and in a politically charged environment, evictions started in Nov. '09. It is estimated that rehabilitation will cost KSh38b, which covers the compensation, tree planting and fencing. www.mongabay.com/

"In the era of global warming, forests are a fundamental requirement for the balance between Carbon emission and Carbon absorption" [Prof. Swaminathan speaking at the World Forestry Congress in Argentina, Oct. '09]

"The HQ of global biodiversity are the tropical rain forests. Although they cover only around 6% of the land surface, their terrestrial and aquatic habitats contain over half of the known species of organisms" [Edward O. Wilson, Biologist and author, 1929 -]

Brazil is the leader in green power, with 40% of its cars being run on bioethanol from sugar cane and 70% of its electricity sourced from hydropower.



Marches on...

by Robert Nabanyumya (UTGA Chairman)

“How do I join UTGA? I need some seedlings now - can UTGA help me? I wish to have more information about tree planting”. These are just some of the questions that were fired at me at the Nov. 4th SPGS clients’ meeting at Kampala’s Sheraton Hotel. As most of the over 150 members at the meeting were new clients to the SPGS, a lot of information sharing was necessary and more interaction is still required. For the benefit of the new clients, therefore, I explained that UTGA was founded in 2006 to bring together tree growers for collective action. The initial critical issues were lobbying and advocacy for favorable financing and also sharing experiences on tree growing.

Now UTGA is an autonomous body working towards improvement and development of a commercial forestry industry powered by the private sector. UTGA exists for the promotion of a profitable, efficient and high profile Ugandan commercial forestry industry.

Benefits to Members

At the meeting, the Chairman highlighted activities, benefits, challenges and opportunities of the UTGA membership. Most notable was that UTGA negotiated the SPGS subsidy to 850,000 per ha (for 25-500ha – where most of the clients lie) from the initial Ushs 600,000. Other immediate benefits are:

- ◆ Land – acquisition and security of tenure – especially those planting on CFR land.
- ◆ Marketing – e.g. identifying markets for our members’ products – e.g. the thinnings.
- ◆ Inputs – seed (not easy to source quality seed individually).
- ◆ Research – the commercial sector is just starting and we need to influence research priorities.
- ◆ Possible access to low interest credit and financing;
- ◆ Information sharing.

How do you join UTGA?

Two easy steps: fill an application form (available from UTGA or SPGS offices) and pay your membership and subscription fees – as follows:

Grower Category	Membership Fee* (Ushs)	Subscription Fee (Ushs)
< 25 ha	200,000	200,000
25-500 ha	400,000	300,000
>500 ha	600,000	500,000

* Payable once only

UTGA Strategic Partnerships

UTGA has rapidly moved on to develop strategic partnerships with institutions that support commercial forestry; notable among them are with SPGS, NORSKOG (see next section), Makerere University Faculty of Forestry and Nature Conservation (MUFFNC) and the Ugandan Carbon Bureau (UCB). The MUFFNC partnership has already produced fruits and a plot of land has been secured at the University where UTGA will have a home and a resource centre to provide for all our members.

Royal Netherlands Embassy to support institutional strengthening of the association. This will be through a partnership between UTGA and NORSKOG, a Norwegian forestry association with over 100 years of supporting private tree growers. This collaboration will enable UTGA to tap into NORSKOG’s great experience in timber markets and value addition. The Norwegian funding to UTGA was signed and sealed on 30th Nov. 2009. The aim is for UTGA to become a stand alone and sustainable organisation within four years and for UTGA members to become capable partners for further development of the forestry sector and forest industries in Uganda. This is certainly great news and will compliment our association with Forestry South Africa.



Robert (centre) entertaining the crowd at UTGA’s new office-opening party in October 2009.

An MoU is being developed with the Faculty to enable the development of the site with an ultra modern building to house UTGA. Isn’t that great? In the meantime, Uganda Carbon Bureau has already signed an MOU with UTGA to help enable members to link to the Carbon market. Who wouldn’t want to sell air?

Who or what is NORSKOG? UTGA has just accessed funding from the Government of Norway through the

UTGA keeps growing. UTGA’s Secretary, Hon. Sheila Kawamara Mishambi, is now a board member of the NFA. Congratulations to Sheila who will be able to push private sector concerns to the board. UTGA’s Chairman took opportunity at the clients meeting to thank the founder members of the association – notably Richard Bakojja, Ponsiano

Besesa; Allan Amumpe and Brenda Mwebaze - for the foresight they had in founding such an important investment vehicle for timber growers. With UTGA’s membership now having planted in excess of 15,000ha in the last five years, UTGA is clearly moving to greater heights. Congratulations to our members and to those who haven’t joined yet – what are you waiting for? Head down today to the new UTGA office located at Plot 42 Luthuli Rise, Bugolobi – “Middle East” (opposite Bamboo Nest), (see contact details p.2).

“GYAMERA GYENE”

This Lusoga saying translates “they grew themselves” and it was quoted by the Minister of Finance, Hon. Syda Bumba. The Hon. Minister was referring to many Ugandans’ attitude towards trees. Of course, attitudes are changing as the wood shortages start to impact on everyone although the trees are still disappearing at an alarming rate. The occasion was the signing of a four-year financial agreement between the Governments of Uganda and Norway, which took place in the grand Boardroom of at the Ministry of Finance on the 13th October 2009. Other notable people present were Ambassador Bjørg Leite (Royal Norwegian Embassy), Mr Jose Soler Head of Cooperation from the European Union (EU) and Minister of State for Water, Hon. Jennifer Namuyangu (the latter was representing Hon. Maria Mutagamba, the Minister of Water and Environment).

Along with the EU’s support (€10m or Ushs28b), the GoN’s NOK36m (around Ushs 11b) will enable SPGS to support not just many thousands of hectares of new tree planting but will create huge rural employment and attract massive additional investment into the sector. Both the Minister of Finance and the Norwegian Ambassador also stressed that the funding will contribute in a major way to Uganda’s efforts to tackling climate change.

It was a short but focussed meeting with many press personnel in attendance and it marked another significant step towards building a commercial forest industry in Uganda. The Hon. Bumba said that the signing was “good news for the people of Uganda” and also that it was “an opportune time for intervention” with the early warning

signs of climate change now affecting the region – namely, protracted droughts, reduced lake levels and irregular rainfall patterns. It was most encouraging to hear the Minister go on to say that the first phase of SPGS had changed people’s attitudes towards commercial forestry and had also created many jobs around the country.



Norways’ Ambassador to Uganda, Bjørg Leite, exchanging signed agreements for financial support to SPGS (2009-2013) with Hon. Minister of Finance, Hon. Syda Bumba.

Ambassador Leite said that Norway had supported forestry in Uganda since the early 1960’s and was happy to continue this collaboration. Despite Norway not being in the EU, it is a close partner and neighbour and thus climate change is a common concern. Mr Soler noted that the EU was honoured to work with the governments of Uganda and Norway as partners in SPGS, especially as the project was successfully mobilizing the private sector in tree planting.

Hon. Namuyangu noted that SPGS is not only contributing to conserving the environment but is creating an industry in the country. “We will ensure that the money is used well and will support the project to achieve its targets” Hon. Namuyangu stated. Holding a copy of SPGS’s recently published *Tree Planting Guidelines* aloft, the Minister proudly used it as example of the GoU’s contribution towards promoting tree planting in Uganda. A satisfying end to a satisfying meeting we all thought.

WHAT YOU THINK OF US



SPGS News is now sent electronically to some 200 overseas contacts who are interested to follow the progress of tree planting in Uganda and we thought we would share with readers some recent feedback.

“This is the best newsletter I receive from a large number of organizations. The writing is good and informative while the pictures are great and illustrative. Congratulations to everyone who contributes to it” Prof. Jeff Burley (ex-Head of Oxford Forestry Institute).

“SPGS is filling a great need for relevant and solid information about forestry operations that is spread to foresters, forest owners, farmers and others in a big number. I am very glad that Norway has come on board with funding SPGS activities. Supporting forest development through SPGS is in my opinion one of the best options regarding quality forest development in Uganda” Karl Solberg (Norway).

“Your newsletter is always the most enjoyable read to me and my colleagues in South Africa. We value the information and stories and we particularly like the quality of the writing that goes into it and the mind-boggling MAIs on your trees that we battle so much to get in our environment because of rainfall and other factors”. Themba Vilane (Mondi SA).

*“Many thanks for this. Can you pass on to the whole team what a brilliant publication you have all produced in **Tree Planting Guidelines for Uganda**. I attach my review of it which I hope will appear in the *International Forestry Review*”. Prof. Julian Evans (author of *Plantation Forestry in the Tropics*).*

Ed’s note: I can categorically state that no money changed hands to compile this article! To keep up the standard, however, we need more contributions from you readers. Please send articles, news items and photos to info@sawlog.ug



COPENHAGEN – Hopes Are High, But Will Forestry Get Support?

Bill Farmer (Chairman, Uganda Carbon Bureau)

As many thousands gather in Copenhagen in December 2009, hopes are high for a global agreement on reducing man-made emissions of greenhouse gases to head off the dire consequences of global warming – but there is no certainty that a deal will be reached between the developed and developing world. At the heart of the negotiations lies the simple issue that climate change is being caused by emissions from the industrialised countries and the rest of the world is demanding that the polluters should pay for sorting out this mess, as a precondition for a global agreement to keep CO₂ levels in check. If the developed countries make that commitment, then the major developing countries have said that they are willing to take 'nationally appropriate actions' to limit their emissions. The world's scientists have a mass of convincing information – but what happens in Copenhagen will depend on political will and an outbreak of global unity to address the biggest issue that the human race has had to face.

If radical reductions in greenhouse gas emissions are not made, the expectation is that average land temperature increases across the planet will be 5.5 °C above pre-industrial levels by 2100. These are astounding temperature rises, and have extraordinary implications for humanity, so just imagine what Uganda's forestry sector will have to cope with in future. Site matching of species will now have to start taking into account future temperature and moisture conditions, well outside anything that Ugandan foresters have had to cope with before.

In Copenhagen forestry is going to be on stage in several ways. A broad agreement has emerged since the Bali climate meeting in 2007 that ways should be found to create financial incentives for tree owners to keep their trees standing. This has evolved into the bewildering range of ideas that is collectively known as REDD (Reduced Emissions from Deforestation and forest Degradation). To

work out how this could be implemented, there has been encouragement (but so far very little money) for 'Early Action' projects. UCB has been working with Margaret Kyenkya on her Abalinda Ebihangwa project next to Bugoma Central Forest Reserve on one of these first learning projects. These REDD projects involve extensive consultations with the communities around the threatened forests to understand the 'drivers of destruction', and to devise ways of brokering win-win relationships with forest owners.



In Copenhagen it is expected that agreement in principle will be reached on incorporating REDD projects into the UN's Clean Development Mechanism – which is the tortuous structure through which UN standard carbon credits can be earned. At the moment, credits can only be created using the Voluntary Carbon Standard (which is what we are doing for Abalinda Ebihangwa), but there are very few projects to guide us on how to structure such schemes. Hence the need for us to group together expertise from Makerere, ICRAF and other consultants to pioneer REDD in Uganda. The CDM itself is being lined up to become more supportive of projects in Africa (such as tree planting enterprises), but to date it has been a big disappointment, and there is a long way to go before it is as user-friendly as it should be. This is not going to change much at Copenhagen, where the focus is mostly on what happens after 2012 when the present Kyoto Protocol (from which the CDM is derived) expires.

Nonetheless, there is now considerable support from groups such as the 'UN's Informal Working Group on Interim Finance for REDD' which has suggested that if at least \$4 billion were made available each year between 2010 and 2015 for 'results based incentives' and

capability building, complementing other REDD efforts, a 25 per cent reduction in annual global deforestation rates could be achievable by 2015. In addition to such funds (that will have to be paid for by developed countries) there is also support to stimulate further private sector involvement in tree planting and forest protection, and for a forest carbon market mechanism to be created as part of the post-2012 climate change agreement.² But all of this will take time to agree, and then more time to implement.

There have been many calls for a Stabilisation Fund to be established to pay for the ongoing ecosystem service of carbon sequestration that is provided by forests. Once deforestation rates are reduced, long-term financial incentives are required to enable countries to reach a stable or growing level of forest cover. Ideas on how this could work will be presented in Copenhagen, but don't plan on being able to access such a fund anytime soon.

Meanwhile other interesting developments such as the role that biochar (basically nuggets of charcoal) can play in improving soil fertility and in storing carbon in the soil, will again be featured in Copenhagen. We will hear about the lobbying efforts of biochar supporters for the inclusion of biochar as a future CDM technique for sequestering carbon. Biochar projects are already underway in Kenya, and we will be meeting representatives of Carbon Gold to discuss the extension of their work to Uganda.

We also have meetings scheduled to take forward the exercise for UTGA members to access the carbon markets. This is already generating interest in potential financial partners, and the networking opportunities in Copenhagen should allow us to have some good face to face meetings. Now this is something that should move at a speed that will bring a smile UTGA members. More on this once we return from Copenhagen.

www.ugandacarbon.org

¹This is the latest prediction from the UK's leading climate change agency, the Met Office's Hadley Centre

²The International Commission on Land Use Change and Ecosystems' forest policy proposals (October 2009) support this dual approach and for the creation of a Stabilisation Fund to be established to pay for the ongoing ecosystem service of carbon sequestration provided by forests.

SCIENCE FICTION OR FACT?



Scientists in the UK have come up with some interesting (if rather whacky sounding) ideas to help in the fight against global warming. Geo-engineering technologies such as artificial trees, reflective buildings, sending mirrors into space to reflect away sunlight and even huge tubes of algae on the sides of buildings could absorb significant amounts of a country's CO₂ emissions.

According to a recent report by the Institute of Mechanical Engineers, geo-engineering is not an encompassing solution to global warming; it is no 'silver bullet', but it could be another potential component



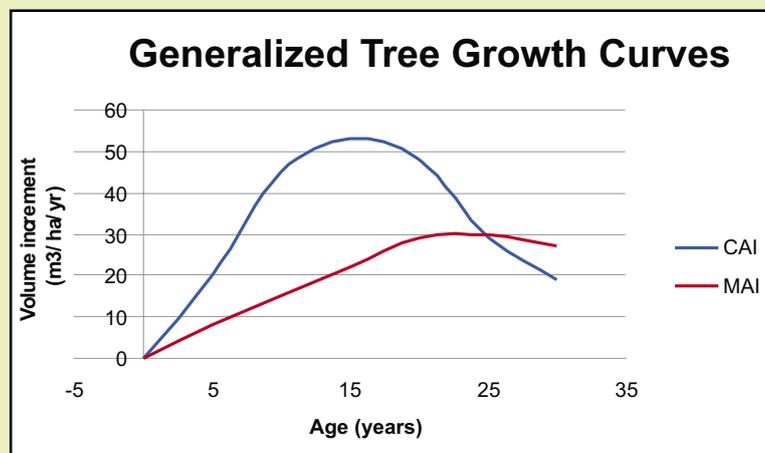
in our approach to climate change that could provide the world with extra time to decarbonise the global economy.

Research is being undertaken into building machines which, like trees, can remove CO₂ from the atmosphere. This occurs when air passes through the device (the tree) and CO₂ sticks to a sorbent material (the leaves). The CO₂ is then removed and buried underground in the same way as conventional carbon capture and storage (CCS).

www.guardian.co.uk see also www.imeche.org/ for the full report.

COMPETITION – SPGS News (25)

Not many know your MAIs from your CAIs judging from the response to the question posed in SPGS News 25. Pat Hardcastle's doodling in the mud was, of course, showing the growth pattern of trees, which we have drawn digitally in the figure here.



The rotation of maximum volume production is when the annual growth increment (Current Annual Increment – CAI) of the stand falls to the level of the Mean Annual Increment (MAI). Thus the point of intersection of the two lines is the peak MAI and this is the point of maximum volume production. In the example shown here this would be 25 years. In reality, other factors often influence the rotation age, for example, especially market issues or other financial considerations.

We had only three correct answers and two of these were ineligible! **Ian Powell** (the British consultant from IDLGroup who reviewed the SPGS late 2008) and **Christer Hermansson** (former Head of Natural Resources at the EC Delegation in Uganda, now in Brussels' EU HQ) both sent in correct answers but the prize has to go to **Otim Moses**.

Moses is a Forester with Global Woods in Hoima. Having joined as a Trainee in 2006, Moses was offered a full-time job with Global in 2007 and has not looked back since! He is in

charge of nursery, thinning and pruning operations as well as looking after the company's computers. Global has already planted 1,600 ha since 2004 in Kikonda Forest Reserve and Moses tells us that their target is an impressive 1,000 ha per year from 2010. We hope that Moses finds time to read his prize of the **SPGS Tree Planting Guidelines** in his busy schedule.



Otim Moses

NEW COMPETITION

Tell us the answer to the following questions (all but one of which can be found somewhere in this SPGS News, so don't complain that they are too difficult – though we suspect No. 5 might stump many of you!):

1. What is the species (Latin) name for loblolly pine?
2. What does CCA stand for?
3. Who was awarded the Nobel Peace Prize in 2004?
4. How many seedlings are expected per kg of Musizi (*Maesopsis eminii*) seed?
5. From what Genus is the large cone pictured on p.2?

Three prizes are up for grabs: 1st out of the hat will receive a copy of Julian Evans' *Plantation Forestry in the Tropics* book (worth Ushs150,000), whilst the next two correct answers will receive copies of the SPGS's *Tree Planting Guidelines for Uganda* (priceless). Send your answers to info@sawlog.ug (or deliver to our office) by the end of Jan. 2010.



WANGARI MATHAAI

- One Women's Story

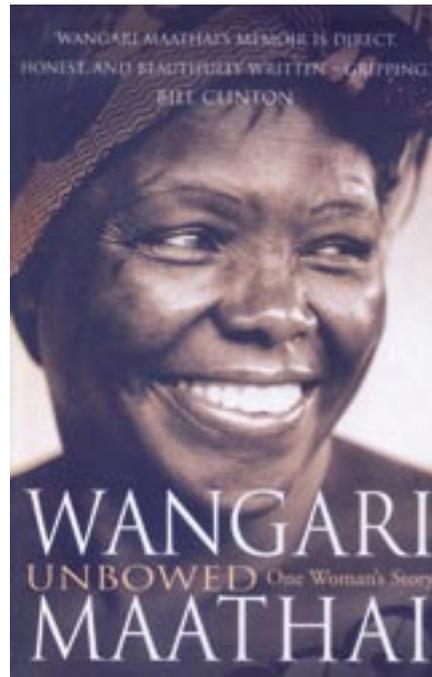
Wangari was born in 1940 in Ithite, a small village in the central highlands of Kenya and was raised in a traditional humble Kikuyu family. She grew up just as any other young African village girl: she ate wild berries, collected firewood, fetched water and played. She was educated in the missionary catholic schools in Kenya. Determined to make it against all odds, she emerged as one of the best students at the time. This earned her a scholarship to study in the US where she pursued a degree and graduated in Biology in 1965. She later became the first woman in East and Central Africa to get a PhD.

In 1965, Wangari received a letter from back home in Kenya offering her a job at the Nairobi University as a research assistant to the Professor of zoology. With great enthusiasm and passion to share her new acquired knowledge, she presented herself to her new boss. Little did she know that her job had already been offered to some one else. Neither an apology nor any explanations was given for this. She later found out that the Professor chose to offer the job to someone from his ethnic tribe. That was her first encounter with corruption and discrimination. This was just the beginning. She later encountered other forms of discrimination – gender-based, tribal, political etc. and was against this background that Wangari took up the struggle to battle against discrimination of any kind. She strongly fought for women's rights through organizations such the National Council of Women of Women of Kenya (NCWK). Later she joined politics and was very instrumental in the fight for Kenya's democracy from the dictatorship rule of Kenya's post-colonial governments.

Wangari was also involved with a number of civic organizations, including the Environment Liaison Centre. As a board member for this organization she attended the "Global Conference on the Environment" meeting in Stockholm in 1972. She writes: "This Stockholm Conference helped raise my awareness of the

realities of environmental degradation in Africa. For me a biologist who had grown up in a rural area where our daily lives depended on the health of the environment, the issues raised were not completely strange".

Her concern for the environment was reinforced during her research about the health and productivity of domestic animals. While in the rural area collecting data, she noticed how rivers running down the hills were silted with soil. "That is soil erosion" she thought to herself. Most of the land that had been covered by forest had been replaced with tea or coffee. In her home village, there was a particular fig tree with a stream



flowing right next to it. This tree was considered so sacred that no one would dare to cut it down lest the gods curse you. To her disappointment the fig tree she was in awe as a child was no more. The new land owner perceived the tree to be a nuisance because it took up too much space so he felled it to make room to grow tea. She then understood the connection between the fig tree and the stream, because when the tree was cut down, the stream was no more.

She also observed that the cows were skinny; there was little grass to eat. The people too looked undernourished and

poor. The women in the organization (NCWK) always raised problems of water, energy (fuelwood) and poor nutrition. It couldn't be any clearer that environmental degradation was already taking its toll on Kenya. The connection between environmental degradation and the causes such as deforestation were self evident. "Something has to be done and now is the time to act" she thought to herself – "why not plant trees?" Trees would provide the fire wood to the women and protect watersheds against erosion. This is how the popular **Green Belt Movement** was born. The 5th June, 1977 was World Environment Day and the Green Belt Movement planted the first seven trees in Kamukunji Park. This was in honor of seven people from different ethnic groups all of whom were community leaders in the 19th and 20th centuries. From this day on, the organization has planted millions of trees in Kenya and provided thousands of jobs for many youths and women in rural areas by raising seedlings in nurseries.

Along with her struggle for protection of the environment, Wangari never gave up the struggle for peace and democratic governance in Kenya. After over 20 years of struggle and setbacks, persecutions, jailing and other forms of intimidation, in December 2002, democracy was ushered in Kenya with the fall of the then ruling party, KANU under the leadership of Daniel Arap Moi (RIP). In 2003, Wangari was appointed the Minister of Environment in the new government.

Wangari was awarded the prestigious Nobel Peace Prize in 2004. In this inspirational book **Unbowed**, her message to the world is: "those of us who witness the degraded state of the environment and the suffering that comes with it can not afford to be complacent. We continue to be restless. If we really carry the burden, we are driven to action. We can not tire or give up. We owe it to the present and future generations of all species to rise up and walk."

Reviewed by Zainabu Kakungulu. *Unbowed* is available from all good bookshops.

SPGS RECOMMENDED PRIVATE TREE NURSERIES



Below is the latest list of SPGS recommended private tree nurseries. Remember that SPGS bears no responsibility for quality or any other services provided by these nurseries. You - the customer - must satisfy yourself that you are getting the right quality of seedling required. Advance bookings are strongly recommended along with a deposit up-front (30% as a guide); this enables the nursery to plan ahead to procure the seed and raise the trees in good time.

Beware! Do not order or buy from a nursery that cannot show you proof of the right quality seed: some 175 kgs of

Brazilian PCH seed was stolen from the NTSC recently and we don't know where this has gone but in all probability it will have miraculously multiplied itself many times over. Over the last few years, we have received numerous reports of pine seed being sold as Brazilian or Australian origin but which has clearly been adulterated with poor quality pine seed. Unfortunately this is only obvious after sowing and sometimes only after planting out when the form and variable growth of the trees betrays its origin. Meanwhile the unsuspecting grower has wasted a lot of money establishing a crop that will never repay the investment.

No	Nursery	District	SPGS Cluster	Contact	Tel
1	Uganda Gatsby Trust clonal nurseries	Mbale Fort Portal Mukono	- Mubende Albertine	Moses Murrami Samson Epilili Simon Ogwal	0772-595545 0782-153659 0752-644995
2	Busoga Forest Co.	Mayuge	Victoria	Teddy Nsambu Nyamaizi	0772-471164
3	Kikonda-SUB	Kiboga	Albertine	Shedrack Kajura	0772-384024
4	Uganda Forestry Suppliers	Kampala	Central	Eric Waiswa Katabazi Judius	0772-487198 0702-438745
5	Kamusiime Memorial Assoc.	Bushenyi	South West	Jonathan Mwebaze	0772-589659
6	Core Woods	Hoima	Albertine	Fred Babweteera	0772-466336
7	Norwegian AG	Lira	Northern	Alfred Macapili	0772-615132
8	Fred Ahimbisibwe	Luwero	Central	Fred Ahimbisibwe	0772-392175
9	UMOJA Farmers	Kakiri-Wakiso	Victoria	Jocelyn Rugunda	0712- 429922
10	TREGD Cob (U) Ltd	Kampala	Central	Paul Ochom	0782-529133
11	E and P Investments Ltd	Kampala	Central	Elvis Fred Mulimba	0772-412 949
12	BESEPO Tree Nurseries	Mubende	Mubende	Jean Vianney A Besesa	0772-905153 0772-501974
13	M & S Forestry Services	Mukono	Central	Apolot Mary	0774-139084
14	Faith and Jolly	Kampala	Central	Joly Mbabazi	0774-519252

FEATURED NURSERY



← *Jean Vianney Besesa's nursery in Mubende: here being visited during SPGS clients' meeting in March, 2009.*

From p.2

With regard to accreditation, SPGS offered to prepare draft standards for nurseries to produce quality seedlings and these would be circulated for discussion prior to the next meeting. SPGS already has a list of recommended private nurseries (above) but these are not officially 'accredited' by anybody. If this raises standards and also assists the nurseries to develop in a more professional, business-like manner, then it surely must be a good approach.

RESEARCH

SPGS has recently advertised many short-term consultancy jobs to be undertaken during 2010. Many of these studies have been drafted in conjunction with UTGA so that priority is given to key areas that will benefit private tree growers namely:

- ◆ Improved nursery technology.
- ◆ Clonal forestry.
- ◆ Studies of key pests and diseases (termites, Blue Gum Chalcid & pine wilt).
- ◆ Silvicultural trials (e.g. weeding comparisons, spacing, thinning and fertilizer trials).
- ◆ Markets for 1st thinning material.
- ◆ Work-study (productivity).

Contact SPGS for further information on all the studies to be undertaken during 2010.



No good just hanging around – send us your articles, stories and photos and see your name in print. Deadline for the next SPGS News (No. 27) is 12th Feb. 2010.

TRAINING

By the time you read this the SPGS 4-day **Plantation Planning & Establishment** course should be in full swing in Gulu (13-17th Dec '09). After analysing the questionnaire we asked all those at the Nov. 4th meeting to fill in, the following courses are planned for the first half of 2010:

Date (2010)	Course	Location	Cluster
31 Jan - 4 Feb.	Planning & Establishment	Luwero	Central
14-18 March	Planning & Establishment	Hoima	Albertine
25-30 April	Plantation Maintenance	Luwero	Central
20-24 June	Planning & Establishment	Kyenjojo	Mubende

These courses are always over subscribed so you need to book ASAP with Josephine at the SPGS office (NB. remember these courses are aimed at your Supervisor/Field Manager who must be able to read and write in English). After the SA contractors' visit, it made us seriously think about scaling up their training too. You can read on p.8 that the most recent course on **Small Business Skills** went down very well indeed with the 23 contractors who attended the week's course. The final module - **Contract Management** – will be run in late Jan/early Feb. 2010.

PLANTING GUIDELINES



"I wish I had known this before wasting my money" is commonly heard by people we visit or talk to. If you don't want to make the same, costly mistakes, then you must get hold of the **2009 SPGS Tree Planting Guidelines**. And don't forget a copy for your field manager(s) too. Written in plain, non-scientific language and with many colour photographs of good and bad practices, no tree grower can afford to be without one. Only Ushs40,000 (US\$

20) per copy: it will save you this money many times over – guaranteed - or your money back!

COMPETITION See Page 17

IUFRO WORKSHOP IN UGANDA 2010.

The International Union of Forest Research Organisations is planning to hold a Workshop in Kampala 26-30 April, 2010. Its full title is *Recognition, Identification & Management of Pests & Diseases of Tropical Plantation and Forest Trees*. This important workshop will be jointly organized by IUFRO, SA's Forestry & Biotechnology Institute (FABI), SPGS and Makerere University. There will be talks and discussions on important P&D problems and a field day for practical experience in diagnosing tree health problems. Presenters will include internationally recognised experts in plantation entomology and pathology as well as local researchers with extensive experience in problems specific to East Africa. Some financial support may be available for East African scientists (from outside Uganda) to attend. Overall numbers will be restricted too: contact Celia Nalwadda at celian@sawlog.ug if you are interested in attending.

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- 👉 Markets for thinnings?
- 👉 UTGA-NORSKOG collaboration.
- 👉 Copenhagen highlights.

Readers' contributions welcomed.

SPGS OFFICE CONTACTS:

Plot 92 Luthuli Avenue, Bugolobi, Kampala. Postal Address: SPGS, P.O. Box 5244, Kampala. (coming from Kampala-turn rt. at Shell Bugolobi & proceed for 1.5kms-office on right).
Tel: +256 312 265 332/3 Emails: info@sawlog.ug Web-Site: www.sawlog.ug