SUITABLE SPECIES AND PROVENACES FOR PLANTATION FORESTRY IN UGANDA:

M.D Byabashaija
and
J.F.O.Esegu

FORUM

Abstract

Research to select suitable species and provenances for planting in Uganda started in 1908 and 1966 respectively. It was not until 1953 that the research was greatly extended when methods of research planning and recording were established in the first written silvicultural research plan. Todate, more than 170 species have been tried in about 400 research plots.

Among the gymnosperms, *Pinus caribaea, Pinus oocarpa and Pinus patula* are by far the most suitable for timber production in the country. *Araucaria angustifolia, Araucaria hunsteinii, Araucaria cunninghamii* and *Cupressus lusitanica* are also important plantation species.

Eucalyptus species, (*Eucalyptus grandis, Eucalyptus camaldulensis* and *Eucalyptus tereticornis)* performed best among the angiosperms. *Terminalia, Markhamia, Measopsis* and *Cordia species* have also performed satisfactorily.

This paper is a review of past experience in identifying species and provenances for plantation forestry. Emphasis is placed on the period after 1953 when the first silvicultural research plan was written.

Introduction

As early as 1900, the natural forest estate in Uganda was considered to be inadequate for sustainable supply of wood products and services.

By 1908 some hardwood plantations had been established around government stations. These consisted of prime timber species indigenous to Uganda, which included *Melicia excelsa* (Mvule); *Entandrophragma utile*, *E. cylindricum, E. angolense,* and *Khaya anthotheca* (Mahoganies); *Markhamia lutea* (Nsambya), *Measopsis eminii* (Msizi).

These species generally grew too slowly to meet the anticipated increased demand for wood and wood products. Tree species that could grow rapidly and had other desirable characteristics had to be identified for plantation forestry.

The choice of species is an important decision in tree establishment. The species to be planted should be adapted to the site, climate, soil and the abiotic environment. Usually, suitable species and provenances show superiority in survival, growth, form and utility.

Species and provenance research is a very important approach in meeting this challenge. It ensures that plantation forestry is carefully planned and given a proper position in the overall national landuse.

The suitability of a species cannot be judged on the basis of one provenance.
A species trial therefore has to include several promising provenances. Analysis and comparison between the site conditions of the countries involved and the ecological characters of the different provenances is basic to species and provenance trials.

Species trials

Species trials in Uganda are as old as tree planting itself which were generally carried out by District Forest Officers and Local Authority Staff. Species research was greatly extended after 1953 when methods of research planning and recording were established in the first silvicultural research plan (Kriek, 1970). Records indicate that over 42 pine, 11 cypress and 52 eucalyptus species, many of which originated from S. Africa where they had been successfully cultivated for over 70 years.

Three basic parameters; survivorship, growth rate and stem form were investigated in these trials.

In 1966, the East Africa Agricultural and Forestry Research Organization (EAAFRO) initiated provenance research mainly on *P. patula, P.oocarpa, P.caribaea, C. lusitanica* and Eucalyptus which earlier on had been identified for plantation development in Uganda. Tree seed for these trials were obtained from local and foreign sources.

Research Plots were located on the basis of the objective of the subject to be studied.

Traits assessed included;
survival (%),
total height,
diameter at breast height (dbh) over bark,
stem straightness (index)- based on an assessment of straightness in 1-m sections of the first 6m of the stem,
stem lean,
multiple stems,

Unfortunately however, it is apparent that most superior provenances were cut down during the periods of turmoil.

Care was taken during planting to give the plants under trial opportunity to show their true response to site factors. Periodic assessment/raw data collection was done according to experimental plans using specific forms.

Data was analysed using ANOVA (Steel and Torrie, 1980) was carried out on the diameter and height measurements to determine their significance. Other parameters considered include; branching habit(s), crown depth and the shapes of the stems/boles

Plantation Species identified

Following the analysis of the data collected, major species for plantation development in Uganda were identified.

Five conifer species were selected for planting in both highland and lowland reserves. *Pinus patula, Pinus radiata* and *Cupressus lusitanica* were earmarked for the highlands (>1200masl). *Pinus caribaea* and *Pinus oocarpa* were designated for the low-lying reserves (<1200masl). *Araucarias (A. cunninghamii* and *A.hunsteinii)* have performed best on cleared sites in the lakeshore region.

Other pine species, which have shown good performance, include: *Pinus kesiya, P.strobus, P.douglasiana*, and *P.leiophylla*

Out of the 52 species of eucalyptus tried, only 3 species, *E. grandis/saligna* (frequently hybridised), E. *camaldulensis* and *E. tereticornis* were selected as the major plantation species. Unlike the conifers, the general populace of Uganda also readily took the planting of eucalyptus. So that in the highlands of western Uganda, where termites are not problematic, *Eucalyptus grandis* is privately grown very extensively on small holdings. *Eucalyptus camaldulensis* and *Eucalyptus tereticornis* on the other hand are the major species grown in the drier parts of the country.

Other hardwood species, which have demonstrated good performance, include *Measopsis eminii, Terminalia superba, T.ivolensis, Grevillea robusta* and *Melicia excelsa.*

The selected species exhibit rapid growth and when combined with proper silvicultural treatments (spacing, thinning, pruning and rotation age) give good financial returns.

Additional species and provenance trials should be initiated for energy, wood/ pole, and industrial roundwood production particularly for the north and eastern parts of the country and the degraded peri – urban plantation sites. In all these endeavors, entomological and pathological studies should be incorporated from the outset.

References

Kriek W (1970); Performance of indigenous and exotic trees in species trials. FAO Report to the Government of Uganda. FAO paper No. TA 2826.

Steel RGD and Torrie JH (1980): Principles and procedures of Statistics. A biometrical approach. 2nd Edition. McGraw-Hill Book company.

Stuart-Smith A.M. 1967; Species and provenance trials. Uganda Forest Department Technical notes No.137/67.

Message naforridir@infocom.co.ug

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Message 1 of 252 **(New)**

From: "Uganda Gatsby Trust" <gatsby@tech.mak.ac.ug>
To: "\"Francis Esegu\"" <naforridir@infocom.co.ug>
Cc: "Prof. Joseph Obua" <obua@forest.mak.ac.ug>, j.obua@vicres.net
Date: 26 Mar 2009, 01:53:50 PM
Subject: Fw: Camcore supplementatry budget response

HTML content follows

For your noting and action.

Joseph Kadoma Byaruhanga
General Manager
Uganda Gatsby Trust
P.O. Box 7062, Kampala-Uganda
Tel. +256 772 647364 or +256 752 694567
Fax. +256 41 4531048
Email: gatsby@tech.mak.ac.ug

----- Original Message -----
From: Abubaker Mwima
To: gatsby@tech.mak.ac.ug
Sent: Thursday, March 26, 2009 12:14 PM
Subject: Fw: Camcore supplementatry budget response

--- On **Thu, 26/3/09, Ben Kanyi <bkanyi@tree-biotech.com>** wrote:

From: Ben Kanyi <bkanyi@tree-biotech.com>
Subject: Camcore supplementatry budget response
To: tafori@morogor.net, "Paul K. A. Konuche" <director@kefri.org>, "Bernard Kigomo" <bkigomo@kefri.org>, "Francis Esegu" <naforridir@infocom.co.ug>, "Evarist Sabas" <dfpr@morogoro.net>
Cc: mbaemuchiri2002@yahoo.com, "'Mhando Leonard'" <mlmhando@yahoo.com>, "Denis Byabashaija Mujuni" <dbmujuni@yahoo.com>, "Abubaker Mwima" <abumwima@yahoo.co.uk>, "Teonas Msangi" <teonasmsangi@yahoo.com>
Date: Thursday, 26 March, 2009, 8:31 AM

Dear CAMCORE EA

Kindly find the decision of Kilimo Trust on the grant request submitted for the CAMCORE support.

Please address the issues raised and provide a way-forward on how to further the grant request with KT in view of the investments already with membership fees paid, germplasm received and sowed ready for trials, the planned training course in SA and the exiting trials from 2005 membership. Let us make an appeal for re-consideration based on the demonstrated commitment since the last meeting in August 2008 and the success of the CAMCORE Technical visit in Feb 2009.

I will appreciate to receive your valuable input at your earliest.

Best regards
Benson Kanyi

Attachment: Camcore supplementatry budget response.doc.zip (application/x-zip-compressed; 93K)

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Message 1 of 252 (New)

Move to: Big Mail Go

KILIMO TRUST

Plot 2, Serunkuma Road, Mbuya, P. O. Box: 7182, Kampala-Uganda
Tel: +256 31 264980/1, Fax: +256 31 264985, admin@kilimo.co.ug

20th March 2009

Mr. Benson Kanyi
Secretariat Coordinator
Camcore East Africa Membership
Kenya Tree Biotechnology Program Trust
Nairobi

Dear Mr. Kanyi;

Re: Supplementary budgets for establishments, maintenance and management of CAMCORE trials and Secretariat Coordination

Thank you for submitting the supplementary proposals for establishment and maintenance of Camcore trials following the registration of Camcore membership for East Africa. The 13th Board of Trustees meeting held on 17th Mar 2009 assessed the proposals concurrently with the Tree Biotechnology evaluation findings and Camcore technical visit report and noted the following issues:

1. The board is uncertain of NaFFORI and KEFRI achieving good results from these trials and CAMCORE membership, and conditionally requests NaFFORI and KEFRI to provide ALL data on clonal trials since their inception in the individual countries. This data should be in the format of the meta-database developed during the Zanzibar meeting. When Kilimo Trust is satisfied that this has been done, then the engagement on support to manage these trials by the institutes will resume. This should be done within the next three months: April, May and June.
2. In the meantime, NaFFORI should find a way to maintain the Ugandan component of the trials and Kilimo Trust will request Prof. Joseph Obua to advise how the CAMCORE trials will be best managed, in the intervening period. Similarly, KEFRI needs to find a way to maintain the Kenyan component of the CAMCORE trials. Together with Kenya Tree Biotechnology Programme Trust (KTBPT) they need to determine the future of these trials in Kenya.

3. TAFORI should continue with management and maintenance of the Tanzanian component.

We shall appreciate if the team can address the above issues

Yours sincerely

Dr. Steven Kimani
Programme Manager