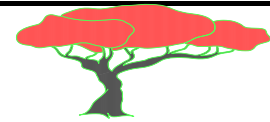


FRIM NEWSLETTER

THE NEWSLETTER OF THE FORESTRY RESEARCH INSTITUTE
OF MALAWI

P.O. Box 270, Zomba Tel: 01 524 866 Fax: 01 524 548

Email: willsagona@gmail.com



www

SPECIAL ISSUE NO. 99

EDITOR: WILLIE SAGONA

February, 2016

EDITORIAL

Welcome to the 99th issue of FRIM Newsletter which is a special issue. This has been a deliberate arrangement to share with you our dear readers during this “Tree Planting Season” the importance of nurturing tree genesis. As you are aware the season runs from 15th December to 15th April every year and the theme for this year is **“Arrest Deforestation, Plant Trees and Conserve Forests”**. Worth noting is the fact that from 2000/01 to 2015/16 tree planting seasons, approximately 762 million tree seedlings (approximately 600,000 ha) have been planted countrywide for plantation forests, catchment protection, and agroforestry purposes (poles, firewood, fruit and fodder) among others. However, tree survival has been a major challenge. There has been low tree seedling survival rate ($\leq 40\%$ on average), poor growth and low productivity despite an encouraging response from the general public towards tree planting in the country. Many organisations, the private sector and individuals have expressed concern over what they describe as low survival rate of planted tree seedlings. For instance, the Chairperson of Ntcheu District Council stated that “if the survival rate was high, we would by now have registered wider forestry coverage in the district. He attributed this failure to low survival rate and poor establishment of planted tree seedlings (19th February 2016 – MANA).

Several factors are known to affect tree seedling survival rate in the field but high-quality planting stock is one of the most

important factors for successful afforestation and re-afforestation programmes. Poor seedlings have low survival rate, Growth of trees from poor seedlings is usually poor and poor quality seedlings create a perception that tree planting is not a viable land-use option for farmers.

In this special issue, the editorial wishes to emphasize some key nursery activities that will ensure high-quality planting stock or seedlings which lead to high tree survival when out planted. Thus, the information provided in this issue may help all those undertaking tree growing in Malawi and it’s our sincere hope that it will bring the much needed difference in as far as increased forest cover is concerned. Esteemed tree growers, it is important to note that good nursery management is key to successful forestry establishment programmes.

Recommended Tree Nursery Management Practices for a Successful Tree Planting Programme

Tembo Chanyenga & Willie Sagona

The continued increase in demand for poles and fuel-wood as a major source of energy in Malawi has necessitated the need for intensifying afforestation programmes in a form of both plantations and communal woodlots throughout the country. However, successful establishment of planted tree seedlings largely depends on use of high-quality planting stock. Tree seedling quality refers to genetic, physiological and

morphological characteristics of the seedling. Genetic attributes relate to those inherited characteristics and are addressed by using seed of high genetic quality. Physiological characteristics of seedling quality include attributes such as root growth potential, mineral nutrients uptake capacity, moisture stress tolerance and a host of other attributes that are difficult and expensive to measure in a simple programme. Morphological characteristics of tree seedling quality refer to the physical condition (height, diameter, height-to-diameter ratio, shoot and root mass, shoot-to-root ratio, form, hardened seedlings, free from pests and diseases). In this issue, quality seedlings refer to morphological quality which is a direct result of nursery management.

Tree seedlings in Malawi are produced from either individual or communal nurseries and the quality of tree seedlings produced in these nurseries depends on the quality of nursery management. The main objective of nursery management is to produce transplants of optimum size (seedlings of 20-30 cm in height) at an appropriate planting time within a minimum period at minimum cost. Results of many years of research indicate that tree seedling of high morphological quality can only be attained if nursery operators follow a Nursery Calendar that was developed by FRIM in the early 1980s. It is therefore strongly recommended that nursery operators at all levels should follow the Nursery Calendar

This special issue emphasises on the need for all nursery operators to follow the Nursery Calendar if they are to produce tree seedlings of high morphological quality. Seed sowing times vary from species to species. As a general guide, on fast growing species such as *Eucalyptus* and *Pinus oocarpa*, it is recommended to sow the seed between August and October to avoid ratooning i.e. cutting back of tree seedlings that have grown more than 30 cm in height. For slow growing species such as most pines, it is recommended to sow the seed between March and April. For such species to attain 20-30 cm height growth, tree seedlings must be kept in the nursery for a period of at least 9 months.

All District Forestry Officers throughout the country are therefore being reminded to consider this important point when ordering seed from FRIM in order for them to produce tree seedlings of high morphological quality.

For large scale planting programmes, particularly with fast growing species such as the *Eucalyptus*, seed sowing should be staggered. This is important in order to avoid labour bottlenecks at pricking out times. It should also be noted that if seed sowing of such species is not staggered, tree seedlings reach optimum size at the same time while the planting operations may continue for 3 months. Seed should be sown in small batches at weekly or fortnightly intervals during the sowing period. Use of small seedlings in planting programmes result in low survival rates in most cases while use of overgrown seedling result in slow establishment rate due to poor root system development as most of roots get coiled around the container soil.

Please follow the nursery calendar provided below in order to produce high morphological tree seedlings for high survival rates and successful establishment once out-planted.



Pinus oocarpa seedlings at FRIM Nursery ready for outplanting with the first rains

NURSERY CALENDAR

Month	<i>Pines (except Pinus oocarpa) and Cypress</i>	<i>Eucalyptus, Gmelina arborea and P. oocarpa</i>
December	Order seed from FRIM (state species, Espacement and area (Ha) to be planted) for Zones F, G, J and M. Repair access roads.	
	Continue transplanting plants to planting site and recovering boxes and tubes	
January	Prepare nursery and seed beds and transplant terraces. Check water supply pipes and taps. Start pot / tube filling	
February	Sow seed in Zones F, G, J and M. Start pricking out as soon as seedlings are ready. Check success rate after pricking out and order more seed if necessary. Water transplants if rainfall is inadequate.	
March	Sow extra seed if necessary. Water transplants if required. Prick out late sown seed.	
April	Start root pruning as necessary. Water transplants. Order seed from FRIM for Zones K and L.	Order <i>Eucalyptus</i> seed from FRIM for Zone A
May	Apply fertiliser to late sown seed. Continue watering and root pruning	Prepare seed beds and terraces for <i>Eucalyptus</i> in Zone A
June	Sow seed in Zones K and L. Prick out when ready and order more seed if required. Continue root pruning and reduce watering level at high altitude.	Order seed from FRIM (State species, espacement and area to be planted). Repair roads and check water pipes and taps. Sow <i>Eucalyptus</i> seed in Zone A. Prick out when ready.
July	Sow extra seed in Zones K and L if necessary and prick out when ready. Continue watering and apply fertiliser if necessary.	Prepare seed beds and nursery terraces. Start filling tubes. Water transplants. Check if root pruning is needed in Zone A
	Order polythene tubes and fertiliser for next season	
August	Continue root pruning and increase rate of watering as temperature rises.	Sow seed in Zones C, D, E, G, J and M at end of month if temperature rises. Water transplants and root prune in Zone A.
	Locate sites for flying nurseries and prepare access road	
September	Continue watering and root pruning. Apply fertiliser if necessary	Sow seed in Zones C, D, E, G, J, and M early in the month, if not already done. Prick out when ready

		and order more seed if needed. Sow in Zones A, B, H, K and L at end of the month. Water transplants. Check height of <i>Eucalyptus</i> in Zone A. Ratoon or transplant as required.
October	Continue watering and root pruning	Prick out sown seed and order more seed if needed. Check transplant height and fertilise if necessary. Continue watering transplants and start root pruning.
	Check planting boxes and repair or re-order as necessary	
November	Continue watering and root pruning	Continue watering and root pruning. Check height early in the month and fertilise or cut back shoots as necessary.

Generally, remember to harden off all transplants before moving plants to flying nurseries and planting sites. After seedling planting, collect all used tubes and ensure the availability of mycorrhizal soil for next nursery season. Polythene tubes and planting boxes should be recovered as planting progresses. Largely, check all necessary equipment such as nursery and field tools and repair or order as necessary.