

# Technical development of long rooted seedlings (LRS) using M-StAR container for dryland restoration in Myanmar

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## Goal Introduction of practical long rooted seedlings (LRS) to Myanmar with scientific evidence

How to introduce practical long rooted seedlings technic ?

### Background

Target area of MRRP\*: about 0.3 million ha till 2027 (Worldbank, 2019)

However, Central dry zone of Myanmar...

- 2 Barriers in conventional reforestation way
- Huge amount of labor input and cost
- Short Rainy period due to climate change

LRS (Long rooted seedlings) → high accessibility to deep soil → high survival (Bainbridge, 2012; D. R. Dreesen & Fenchel, 2010).

However, Existing LRS → difficult to handle → not practical → not popular in dryland.

New LRS technic mixing with 3 tools was invented in this project.

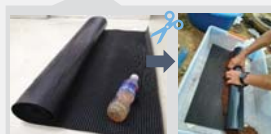
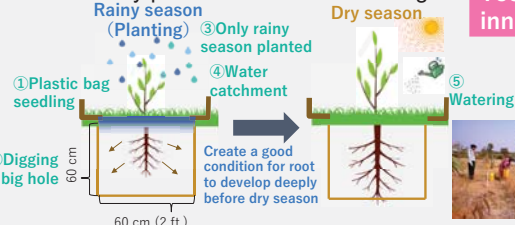
Technical innovation

M-StAR container

Coconut peat

Engine auger

New M-StAR LRS



- Easily change the container size
- Easily openable



- Cheap, light, and high water holding capacity



- Few seconds to dig a deep hole

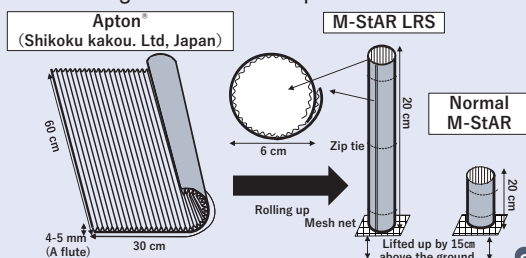


### Methods of field experiment

Site: Nyaung-U township, Mandalay division

Seedling production

- Seedling period: 10 months (transplanted Feb 2019)
- Growing media: coco nut peat with chemical fertilizer



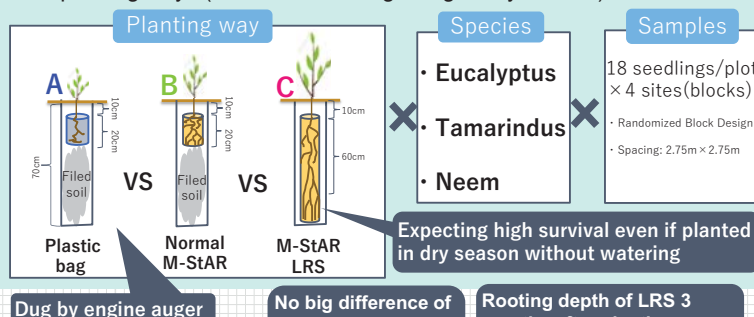
Straight root (Air pruning)

Spiraling root

Design of field experiment

Objective: Reducing cost (no big hole nor watering) and Expanding planting period

3 planting ways (Planted at the beginning of dry season)

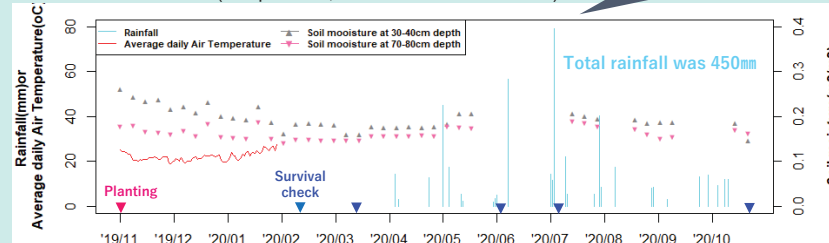


### Results

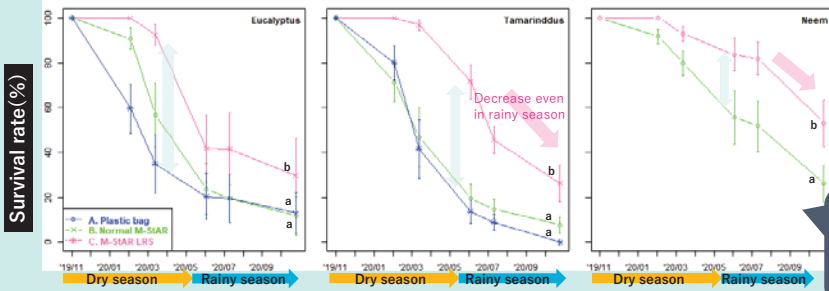
Root structure just before outplanting



Field condition (Temperature, Rainfall and Soil moisture)



Survival



All the 3 species of LRS survived dry season. But, survival rate decreased during rainy season. It might be caused by weeds

LRS developed good root

LRS survived dry season without watering !

### Possibility of implication of M-StAR LRS for dryland reforestation in Myanmar

Cost comparison (Roughly estimate)

Main items	Plastic pot (Conventional)	Normal M-StAR	M-StAR LRS
Pot material	5 kyat/plastic pot	230 kyat/container	700 kyat/container
Growing media	6~12 kyat/seedling (Field soil)	6~12 kyat/seedling (Coconut peat)	18~36 kyat/seedling (Coconut peat)
Labor cost at nursery	70 kyat/seedling	Growing period is short(6 months OK), No need of weeding nor root cutting → Surely cheaper than conventional way	
Labor cost for digging hole	300~600 kyat/hole (8ft. cubic) (10 - 20 holes a day by hand)	50~70 kyat/hole (80~120 holes a day by engine auger)	
Labor cost for watering	300 kyat/seedling + Bowser (Rainy season planted)	Expected no watering when planted rainy season	0 kyat (It was verified that no need of watering even if planted in dry season)

Conclusion

- LRS has high possibility to solve barriers for dryland reforestation
- Normal M-StAR also produced a good seedling compared to plastic bag with moderate cost

Further step

- Establishment of a LRS Model forest
- Try Valuable species such as *shorea* spp., *Dalbergia* spp.etc.

M-StAR can be applicable to central dry zone of Myanmar according to purpose and situation. If you are interested in our project, feel contact to us !

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