

Phalombe trees booklet

1st edition –
2021



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- Promoted species
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Senna siamea seedlings in nursery



Senna siamea sowed directly on its final location during the dry season
in August 2021

Picture taken in October 2021

December
- April

Rainy season

(500 to 700 mm)
Frequent drought and floods
(20 – 35°C)

The context of Phalombe district



May -
August

Winter

mostly cloudy –
possible showers
cold at night
(7 – 25°C)

The catchment area is located in the western part of Phalombe District, southern region of Malawi nearby Mulanje Mountain (15 km).

- Altitude: 780 m
- Type of soil: Sandy or heavy clay
- Presence of several NGOs
- Low survival rate (difficult context to grow trees – low survival rate of young seedlings)
- 83% of the population under the line of poverty (highest incidence in Malawi (source Ifpri malawi))

September
- November

Hot season

Sunny and warm
Thunderstorm in
November
(25 – 35°C)



Promoted
species

Species promoted by the project ★

Agroforestry / Afforestation

- Senna siamea ★
- Albizia lebeck ★
- Gliricidia sepium ★

Other species:

- Khaya nyasica
- Lonchocarpus capasa
- Melia azedarach



Melia azedarach



Gliricidia sepium



Annona senagalensis

Fruit trees

- ★ • Mango (*Mangifera indica*)
- ★ • Pawpaw (*Carica papaya*)
- ★ • Guava (*Psidium guajava*)
- ★ • Mexican apple (*Casimiroa edulis*)
- ★ • Annona (*Annona senagalensis*)



Carica papaya



Seed local
collection
calendar

Calendar for the species promoted the most by the project ★



Senna siamea



Gliricidia sepium

February	March	April	May	June	July	August	September	October	November	December	January
					Senna siamea						
					Albizia lebbeck						
								Gliricidia sepium			
								Mexican apple			
	Red guava		White guava								
									Mango		
	Annona (dwarf)							Annona (tall)			



Carica papaya *dry seeds*



Casimiroa edulis



Albizia lebbeck



Green anona
(From February to May)

To go
further...



Faidherbia albida
(from July to September)



Afzelia quanzensis
(from May to August)



Tephrosia candida
(from August to October)



Senna spectabilis
(from July to September)



Terminalia catappa



Khaya nyasica



Melia azedarach
(from June to September)



Jatropha podagrica



Seeds
pre-treatment

Could you recognize those seeds?*



- Nicking or soak in cold water for 3 hours
- 3 seeds per tube
- Sown between 1.5 and 2 cm deep
- October and November



- Tie the seeds in a cloth and put them in hot water for about 10 min
- Plant the same day
- 3 seeds per tube
- Sown between 1.5 and 2 cm deep
- From August to October

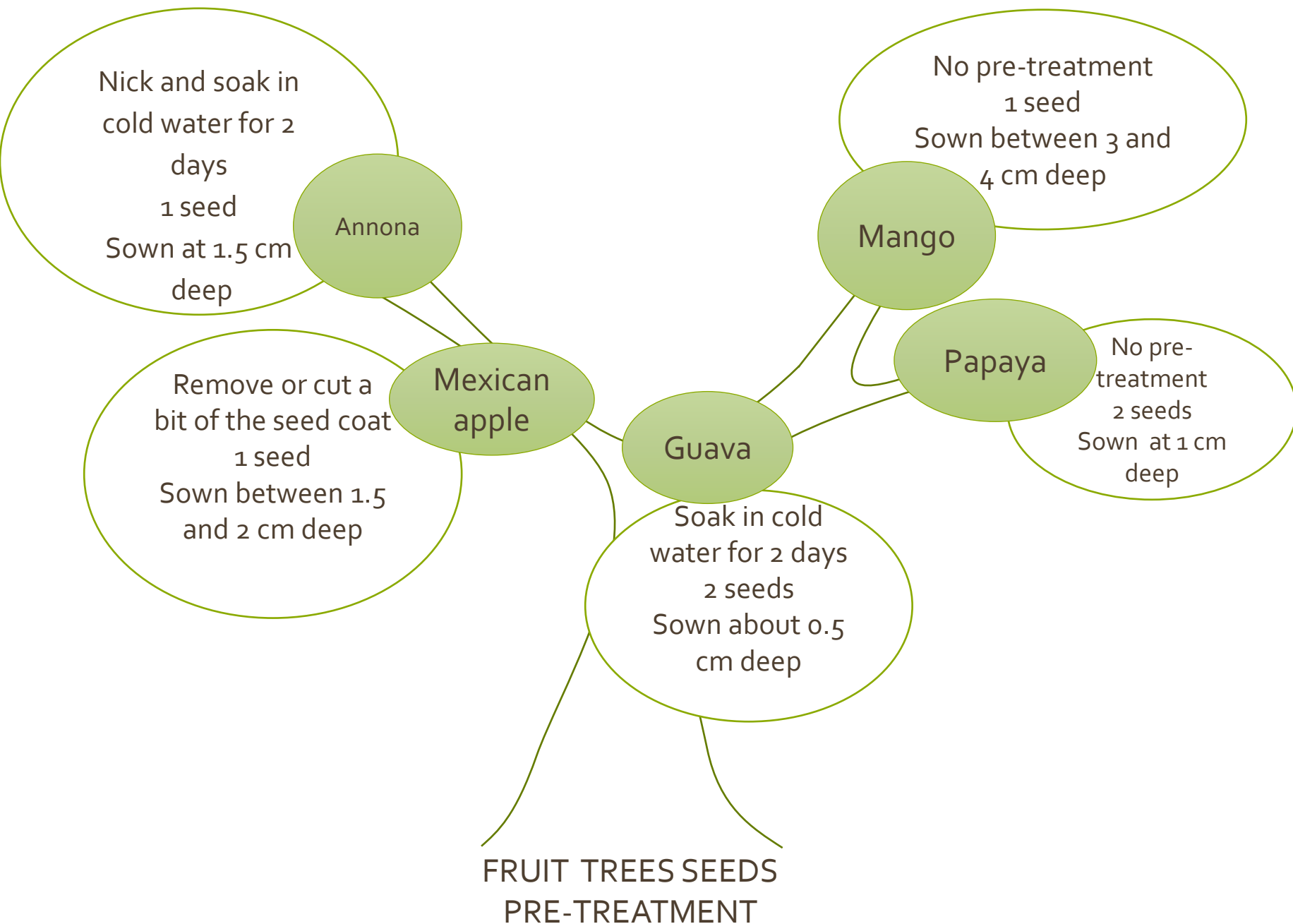



- Nick and soak in cold water for 12 hours
- 3 seeds per tube
- Sown at 1 cm deep
- From August to October

Definition box

Nicking: making small cut in a surface or an edge. You can use a nail clippers

Seed coat: the outer integument of a seed.



The image features a central olive green rectangle containing the text "Seed germination period" in white. This central rectangle is flanked by two vertical brown rectangles on either side, creating a symmetrical design.

Seed
germination
period

- ❖ *Acrocarpus fraxinifolius*
- ❖ *Combretum imberbe*



- ❖ *Gliricidia sepium*
- ❖ *Senna siamea*

- ❖ *Acacia polyacantha*
- ❖ *Mangifera indica*
- ❖ *Casimiroa edulis*



- ❖ *Lonchocarpus capasa*
- ❖ *Leuceana leucocephala*



- ❖ *Annona senagalensis*
- ❖ *Faidherbia albida*
- ❖ *Melia azederach*
- ❖ *Khaya nyasica*

- ❖ *Albizia lebbeck*
- ❖ *Citrus*
- ❖ *Jacaranda mimosifolia*
- ❖ *Tamarindus indica*

- ❖ *Carica papaya*
- ❖ *Psidium guajava*

Germination in weeks



Alternatives planting techniques

Why promoting alternative techniques?

- Most of the nurseries usually use polythene tubes (plastic) to raise seedlings



→ That technique presents some disadvantages

- Plastic pollution
- Difficult access to the polythene tubes in rural area (rare suppliers and high prices)
- Requires nursery construction
- Time consuming for watering and seedlings management during the high field activity peak for the farmers (September – November)

→ That is why the project also promotes some alternative techniques that are more sustainable and less time consuming

Before going further...

Some definitions...

- **SWAZ BED – bare rooted seedlings:**

- A germination bed made of soil in which the seeds are sown in line. The seedlings will be transplanted later to the plot without the soil = bare rooted.



A farmer sowing *Gliricidia sepium* seeds in line in the SWAZ Bed

- **Direct sowing – dry planting**

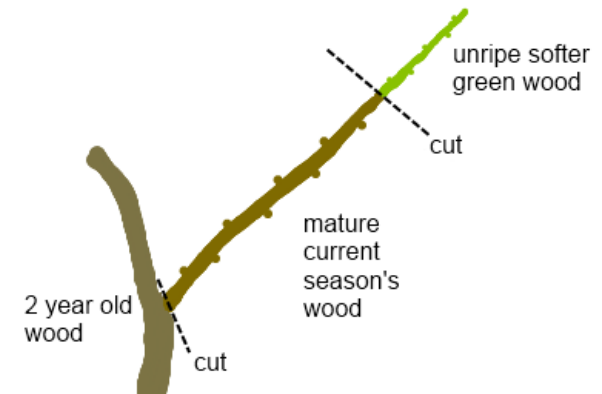
- The seeds, after needed pre-treatment, are sown directly in the soil before the rains starts for a better survival rate. The farmer must dig a big pit and mix with manure to boost the germination. Frequent watering is a key factor for success. The pit should be big enough (min. 30cm) and manure should be added for better result.



Senna siamea
dry direct sowing
from October
Picture taken in
December 2020

- **Vegetative propagation – cuttings**

- The technique entails multiplying vegetative material using cuttings from trees. A 50 cm- mature branch is collected from a mother tree. A cutting should get several nodes. Its transport can be made in wet sack or clothes. It is planted at 25 cm deep and watered once a week minimum. Ash can be added to avoid pest.



SWAZ BED – Bare rooted seedlings



Gliricidia sepium young seedlings in line in a SWAZ Bed

Advantages	Disadvantages
Gain of space & time	Not suitable for all species *
No use of polythene tubes	Stress for the roots when transplanting (Survival rate is less good than polytubes seedlings for <i>Gliricidia</i>)
	Transport requires wet clothes or dedicated container

Specie

Sowing period

Gliricidia sepium

October – November



↕ Sowing lines
every 10cm

The survival rate can be compensated by the large number of seedlings produced



SWAZ Bed of *Gliricidia sepium*

* Tested : *Gliricidia sepium* with good results Under test: *Acacia polyacantha*, *Albizia lebbeck*

Direct sowing – dry planting



Magret Yang'anila - Gomani VH in May 2021 –
Senna siamea Dry direct sowing October 2020

After 7 months

Advantages	Disadvantages
Trees grow fast After 6 months average size of 60 cm	Requires frequent watering from October till the rain falls
Trees do not have stress unlike seedlings during transplanting	
High survival rate when well monitored (85%)	



Magret Yang'anila plot – Gomani VH in May 2021
Albizia lebbbeck direct sowing October 2020

After 7 months

Vegetative Propagation – Cuttings

Advantages	Disadvantages
Grow very fast after a few months equivalent of 2 years old tree	To plant in dry season = watering once a week minimum
	Transport



Bertha Namhimba- Gomani VH
Gliricidia cuttings planted in October
Picture taken in January 2021
After 3 months



Mr Dunken - Gomani VH
Guava cuttings with
guava fruits -
After 3 months

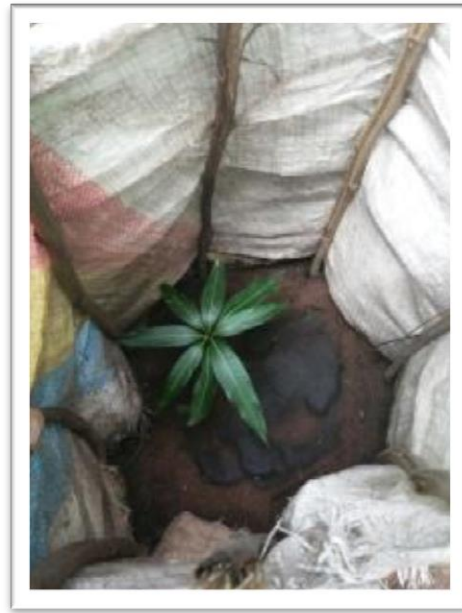


Benito Sanuwedi - Julius VH
Gliricidia cuttings planted in November
Picture taken in March 2021
After 3 months

Tree protection techniques



To be preferred



- Well protected
- Light should go through
- Strong protection
- Fruit trees + fodder trees (*Acacia polyacantha* etc...)



To be avoided ❌



- Protection too small
- The goats or other livestock can easily access the tree and eat it
- The protection made with bricks: the bricks may fall on the tree and break it





Some technical tips



Acacia polyacantha

Prune + stick at early stage
Highly Edible by the goats!

Bottle irrigation:

- Pierce tiny holes in the bottom
- Bury half of the bottle
- You can fill it from the top with water
- Water diffuses slowly in the soil

Ideal for Cuttings and Direct sowing techniques



To go further with some techniques...

Identification of trees *to avoid destruction :*

When protection is not possible (in the field, for non fruit trees for instance)

Don't use stick because

- they can be stolen first of all
- it requires to collect firewood.. that could be use as ...firewood..

→ Better to clear around the trees like a bassin ; It is easily visible





Importance of the pit size

for seedlings in polytubes or bare rooted

For a better roots implementation, the pits should be at least **45 cm x 3** (length-width- depth)

For the fruit tree seedlings, the pits can be dug at 60 cm x3

Manure can be added to boost the tree growth

Importance of watering during dry season

The first dry season (from April to November) is crucial in the tree survival rate. The farmers can **water the trees twice a week** in order to boost the growth and increase the survival chances.

Best period for pruning trees:

August (end of Winter)



Senna spectabilis pruned in Lilongwe and branches stored