







# Selecting quality planting materials for cacao-based agroforestry systems

Sustainable Farming in Tropical Asian Landscapes (SFITAL)





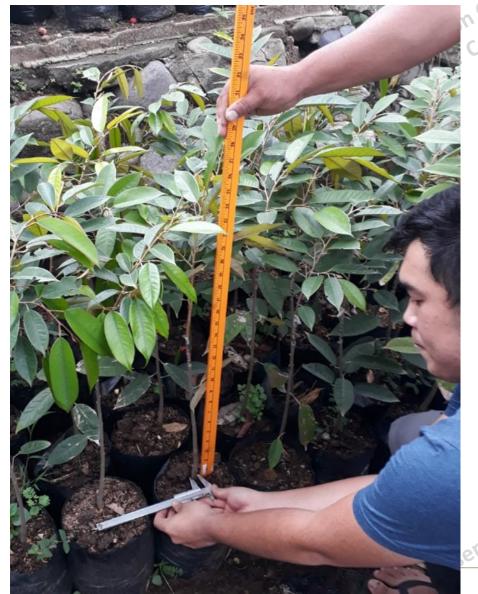
#### Selecting quality planting materials



- Good planting materials is the basis for tree planting success. Don't waste your land preparation effort by choosing low-quality seedlings.
- Make sure to buy seedlings from cacao nurseries that are accredited by the Bureau of Plant Industry.



#### Selecting quality planting materials



## Sturdiness of the seedlings

 To assess a seedling's sturdiness, we calculate its sturdiness quotient: the height ratio to root collar diameter.

- A quotient of 6 or less indicates a sturdy seedling, while a value above 6 signifies a "lanky" seedling, which is tall and slender.
- Lanky seedlings are less likely to survive in windy and dry conditions.



World Agroforestry	eedlings Standards Characters	rsification Clonal Diversification Cacao
Cacao Seedlings Standards		chop on Cacao
No.	Characters	Standards
1	Age of seedling	5- 6 months
2	Height of seedling	45-50 cm
3	Girth of seedling	3.5- 4 cm
4	No. of leaves	6-8 pairs
5	Growth	Straight from the middle of the poly bag, without branching or jorquetting.
6	Foliage	Green, healthy, without crinkling, nutrient deficiency, middle leaves of 15cm length and 6 cm width



World Agroforestry	- Aliana Chandaula on Clonal Dive	rsification on Clonal Diversification
> Cacao Seedlings Standards		Hob Cacao
No.	Characters	Standards
7	Root	Tap root spreading without netting
8	Potting mixture	<ul> <li>10% dried animal manure + 10% organic matter + 80% sieved loam soil.</li> <li>20% cocopeat + 20% rice hull + 20% carbonized rice hull + 20% garden soil + 10% fine sand +10% vermicast add about 2 kgs limestone or dolomite.</li> <li>Used poly bag of at least 8" x 10" size and 250-gauge thickness</li> </ul>
9	Precautions	Free from nursery diseases and pests

Earth in poly has should be wet loose. No breakage or damage to tan root



## Selecting quality planting materials

- Use grafted seedlings
   1. At least 6-8 pair of mature healthy leaves.
   No new fight
  - 2. No new flushes of leaves
  - 3. No sign of pest infestation





World Agroforestry	raft Standards Characters	rsification on Clonal Diversification
Cacao Graft Standards		thop ou Cacao
No.	Characters	Standards
1	Method	Wedge grafting
2	Type of root stock	Bulk Forastero, Trinitario and hybrid seedlings
3	Root stock raising	Poly bag nursery
4	Age of root stock	At least 6 months
5	Root stock size	Height 50 cm, 3.5 cm girth with 7 pairs of leaves
6	Scion size	Thickness same as root stock, soft woods of 12-15 cm length with 3 active eye buds, defoliated



World Agroforestry  Cacao Graft Standards  No. Characters		In Diversification
> Cacao Graft Standards		thop ou Cacao
No.	Characters	Standards
7	Graft union	20 cm above the base/soil, wrap about 3 cm below from the union to the tip of the scion using 3 cm thick grafting tape, should be covered with ice candy cellophane wrapper to avoid drying
8	Grafted plant without jorquetting	Height 60 cm, 6-8 pairs of healthy leaves, stem straight
9	Root	Tap root with well spread young roots
10	Precautions	Remove the polythene pouch or ice candy cellophane wrapper after 15-20 days

Transforming Lives and Landscapes with Trees



Cacao Graft Standards

#### **Standards**

- Remove polythene stripe or grafting tape after 2 months.
- Graft joint should be above ground while planting and no breakage.
- Emerging shoots from root stock should be nipped off.
- Free from nursery diseases, pests, deficiencies, pot bound condition.

Transforming Lives and Landscapes with Trees



#### Selecting quality cacao planting materials

> Plant at least five National Seed Industry Council (NSIC) approved clones:

#### Example:

- 1. UF 18 early maturing, Ave, pod index: 20, high-yielding, tolerant to VSD
- 2. PBC 123 self-compatible, Ave, pod index: 23, high-yielding, tolerant to VSD
- 3. BR 25 early maturing, Ave, pod index: 34, high-yielding, tolerant to VSD
- 4. K9 -
- 5. K10 -
- The following clones also show remarkable performance but have not yet been approved by NSIC:
- W10 high yielding
- EM617 -High yielding, big beans -at least in high elevation area (ex. Maragusan, DdO.)
- PG610 Big pods.



## Quality planting materials as shade trees for cacao

- > Cacao as a forest tree species requires shade. (10%-30% shade)
- > Shade can be considered to ameliorate the cacao micro-environment.
- > Healthy native tree species
- Preferably nitrogen-fixing trees
- Planted with right spatial arrangement and meticulous selection of morphological structures

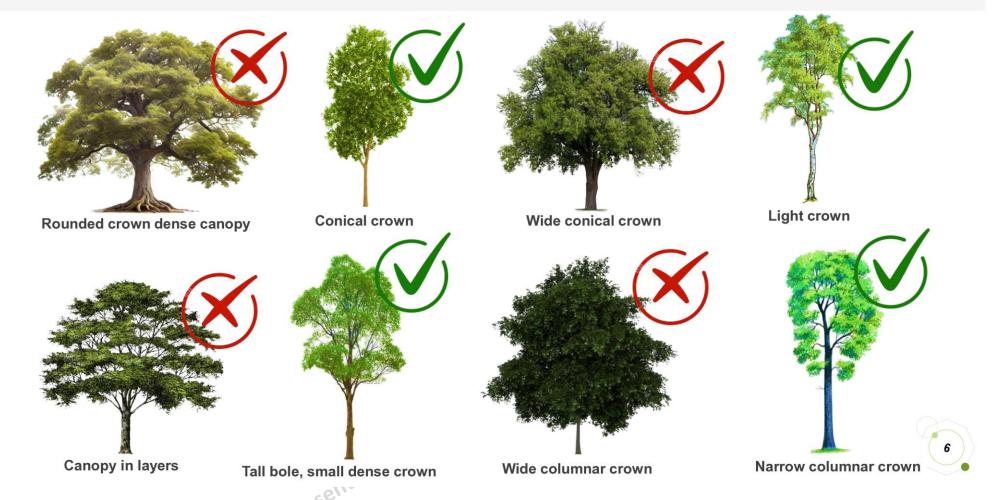




## Quality planting materials as shade trees for cacao

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## Example of canopy shapes suitable as shades for cacao trees





Important consideration in selecting shade trees for

cacao-based agroforestry systems

#### > Functional characteristics

- 1. Economic functions (e.g. coconut, fruit trees, banana, rubber-PB260) can augment farmers' income.
- 2. Fertilizer trees fixes atmospheric nitrogen (e.g., nitrogen-fixing trees)
- 3. Biodiversity functions (e.g., Ficus species produce small edible fruits for animals)
- 4. Sequester Carbon/can provide ecosystem services (e.g. Native tree species Toog, Lauan, Ipil, etc.







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# Thank you!

