

Seed Propagation Protocol Form



SEED PROPAGATION PROTOCOL

This form collates the information about the best method for seed propagation and growing up of the target species.

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Logo/s of the affiliated organisation(s):

This propagation protocol is subject to change and updates when new information on the propagation of the species becomes available. If there any comments or changes you would like to make, please send the information to africa@bgci.org

GENERAL INFORMATION

Taxon name	<i>Scientific name of the propagated species</i>	<i>Entandrophragma bussei</i>	Name/s of propagator/	<i>Name(s) of the person or people that carried out the propagation</i>	Fandey H. Mashimba, Doris Macha, Mwamtolo Said
Family	<i>Plant family of the propagated species</i>	Meliaceae	Organisation	<i>Organisation(s) where the propagation was carried out</i>	TFS
Origin of seeds	<i>Site(s) and country where seeds were collected</i>	Miombo woodland, Morogoro, Tabora, Katavi and Kigoma	Site and country	<i>Site(s) and country where the propagation took place</i>	Morogoro Region, Tabora, Katavi and Kigoma Tanzania

SEED DESCRIPTION & PROCESSING

Description of the seeds and the processing of the seeds before seed sowing.

Time of year for seed collection	<i>List month/s of the year when seed collection is best</i>	August–October
Fruit/seed transport	<i>Describe how fruit/seeds have been stored during transport from the field to the nursery</i>	<ul style="list-style-type: none"> Fruits are collected directly from tree when are pale brown or brown. Transported in well-ventilated bags (sisal or mesh bags). Avoid plastic bags to prevent overheating and fungal growth. Kept dry and shaded during transport.

Processing of fruits/seeds	<i>Describe how the fruits/seeds are processed in situ or in the nursery (seed extraction methods, seed cleaning, handling of fruits/seeds...)</i>	<ul style="list-style-type: none"> • Capsules dried under shade for 3–7 days until they split open. • Seeds manually extracted. • Wings may be trimmed if necessary for sowing. • Debris and damaged seeds removed by hand sorting. • An estimate of about 10kg of fruits produce 1 kg of clean seed
Method to assess seed viability	<i>Describe method used to estimate seed viability (e.g. floating test, cut test, tetrazolium test, X-ray test)</i>	<ol style="list-style-type: none"> 1. Cut test <ul style="list-style-type: none"> • Cut seeds longitudinally. • Viable seeds have firm, white/cream embryos. • Empty or darkened seeds are non-viable. 2. Floating test <ul style="list-style-type: none"> • Place seeds in clean water. • Viable seeds often sink; empty seeds float. (Note: Less reliable due to winged structure.) 3. Tetrazolium red test (more accurate) <ul style="list-style-type: none"> • Not conducted but Seeds soaked and treated with Tetrazolium solution, living tissues stain red.
% Estimated seed viability	<i>(Number of viable seeds) x 100 / (Total number of seed for which viability was estimated)</i>	Typically 60–80% under good collection timing and storage conditions
Type of seed	<i>Choose one of these options: Orthodox, Intermediate, Recalcitrant or Unknown</i>	Are intermediate between orthodox and recalcitrant
Seed size	<i>Include a measuring unit (e.g. mm, cm...)</i>	<ul style="list-style-type: none"> • Length: 1.8cm • Width: 1.5 cm Diversity exists and varies slightly depending on the site quality and provenances
Number of seeds per gram	<i>Count a reasonable number of seeds and weigh them. Then, divide the number of seeds by their weight (e.g. 100 seeds / 5 g = 20 seeds/g)</i>	There are about 1500 seeds per kilogram
Seed storage	<i>If seeds have been stored before germination, mention storage facilities (seed bank, fridge, freezer), and describe conditions (humidity, temperature), type of container, and storage time length.</i>	<ul style="list-style-type: none"> • Stored in airtight containers preferably in dry room (15°C and 15 R.H). • At ambient storage facility make sure you install a dehumidifier and storage duration vary from 6–12 months under cool, dry conditions.

+ **Add photographs of the fruit and seeds. Make sure to include a detailed description of the photo, such as the growth stage, date, activity or process.**

SEED PROPAGATION PROTOCOL

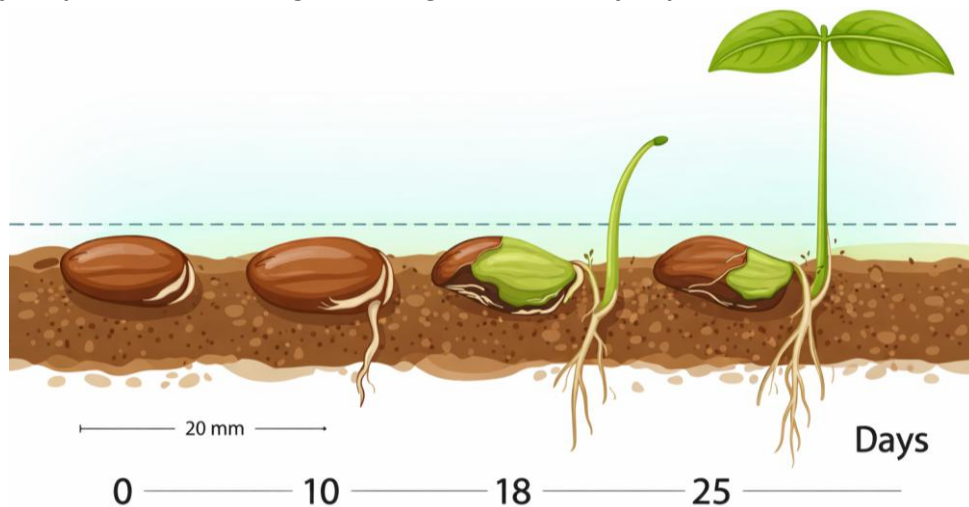
GERMINATION

Description of procedures, materials for seed germination and the germination success.

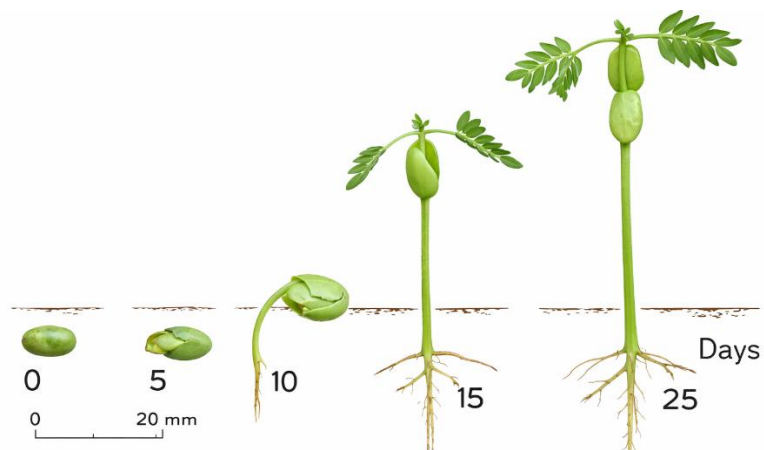
Procedures	Seed treatment	<i>Describe treatment applied to the seed before sowing (e.g. mechanical scarification, chemical scarification, soaking, stratification, smoke treatment...). If applied, include the duration of the treatment.</i>	Seed wing should be removed before sowing. Soaking in clean water for 12–24 hours or until seeds are imbibed before sowing improves germination.
	Seed sowing media	<i>Media composition: include percentages/ratio for the different components</i>	Recommended mixture: Tree Sees Production - Morogoro <ul style="list-style-type: none"> • Top Black Forest soil – 63% (5) • Well decomposed Manure – 25% (2) • Rice husk – 12% (1) Ratio is 5:2:1 Well-drained and sterilized if possible.
	Container	<i>Describe size and material of the container in which seeds are sown</i>	<ul style="list-style-type: none"> • Seed trays or nursery beds for initial germination. • Polythene tubes (10–15 cm diameter, 20–25 cm height) for pricking out.
	Seed spacing	<i>Describe the recommended spacing between the seeds when sown. Include a measuring unit (e.g. mm, cm...)</i>	2–3 cm apart in seedbed
	Seed depth	<i>Describe how deep the seeds are sown. Include a measuring unit (e.g. mm, cm...)</i>	<ul style="list-style-type: none"> • Sown at 1–2 cm depth or twice the size of the seed • Light covering with fine sand.
	Watering technique	<i>Describe watering tool, technique and frequency during sowing and germination</i>	<ul style="list-style-type: none"> • Fine watering can or misting. • Twice daily (morning and evening), depending on weather availability. • Avoid waterlogging.
	Germination facilities	<i>Describe the facilities where the germination of seeds took place (e.g. close case, outdoor shaded area, heated bench, covered/bagged container...)</i>	<ul style="list-style-type: none"> • Open field/outdoor shaded nursery (50% shade net). • Raised seedbeds with good drainage.
	Environmental conditions	<i>Describe the environmental conditions where germination took place (temperature, humidity, and photoperiod)</i>	<ul style="list-style-type: none"> • Temperature: 20–30°C • Humidity: Moderate (60–80%) • Light: Partial shade
Success	Time of year for seed germination	<i>List month/s of the year when seed germination</i>	1. Northern & Eastern Zone <ul style="list-style-type: none"> • October – December • March – May

		<i>is best</i>	2. Central Zone <ul style="list-style-type: none"> • November – April • May – October 3. Southern & Western Zone <ul style="list-style-type: none"> • November – April
	Duration until germination	<i>Average number of days/months/years until seeds germinated</i>	14–28 days after sowing.
	% Germination success	<i>(Number of seeds germinated) x 100 / (Total number of seeds sowed)</i>	Germination is good and uniform, but sometimes delayed, reaching 30% after three weeks and 70% four weeks from sowing
Materials		<i>List the materials needed for seed germination to help with the planning of this activity. E.g. trays, sieves, dibbers, labels, ruler...</i>	<ul style="list-style-type: none"> • Seed trays or nursery bed • Fine sand • Topsoil • Compost • Watering can • Shade net • Labels and marker • Sieve • Ruler

+ **Add photographs of the germination process. Make sure to include a detailed description of the photo, such as the growth stage, date, activity or process.**



Entandrofragma bussei



FIRST POTTING

Description of procedures and materials for the cultivation of the plants and the success of the growing of the plants.

Procedures	Growing Media	<i>Media composition: include percentages/ratio for the different components</i>	<p>Recommended mixture: Tree Sees Production - Morogoro</p> <ul style="list-style-type: none"> • Top Black Forest soil – 63% (5) • Well decomposed Manure – 25% (2) • Rice husk – 12% (1) <p>Ratio is 5:2:1</p> <p>Well-drained and sterilized if possible.</p>
	Container	<i>Describe size and material of the container in which plants are potted</i>	Black polyethylene bags of height 8–10 cm and diameter 101.4 mm or 4"
	Fertiliser	<i>If used, include: type (organic or inorganic); nutrient composition and its ratio; and application (added to soil, dissolved on water, foliar application)</i>	<ul style="list-style-type: none"> • Organic compost mixed in media. • Optional: NPK (e.g., 20:10:10) applied at low rate after 4–6 weeks. • Application: Dissolved in water and applied to soil.
	Watering technique	<i>Describe watering tool, technique and frequency while growing the plants</i>	<ul style="list-style-type: none"> • Watering can with fine rose. • Once daily (adjust based on rainfall and temperature).
	Plant growing facilities	<i>Describe the facilities where the plant growing took place (e.g. glasshouse, outdoors, shaded area...)</i>	<ul style="list-style-type: none"> • Shade nursery during early stage • Gradual exposure to full sunlight
	Environmental conditions	<i>Describe the environmental conditions where the plant growing took place (temperature, humidity, light levels)</i>	<ul style="list-style-type: none"> • Temperature: 22–32°C • Light: Partial shade initially, increasing sunlight gradually. • Good air circulation.
Success	Number of days until first potting	<i>Average number of days since the start of seeds sowing until first potting</i>	21–30 days after germination (when 2–3 true leaves appear).
	Duration until established plants	<i>Average number of days/month/years for which the plant growth was monitored until the establishment of plants</i>	4–6 months in nursery before field transplanting.
	% Plants established	<i>(Number of plants established) x 100 / (Total number of plants potted)</i>	Typically 70–85% survival after potting and hardening.

	<p>Health observations</p>	<p><i>Record any signs of pest or disease, nutrient deficiency, damage... and the stage when they were observed (e.g. during germination, growing of seedlings, growing of plants....)</i></p>	<ul style="list-style-type: none"> • Damping-off during germination (fungal). • Leaf miners and caterpillars at seedling stage. • Possible nutrient deficiency (yellowing) if soil is poor.
<p>Materials</p>	<p><i>List material needed for potting to help with the planning of this activity. E.g. pots, dibbers, labels...</i></p>	<ul style="list-style-type: none"> • Polythene tubes • Potting mix • Dibber • Labels • Watering can • Shade net 	

- + ***Add photographs of the pricking out, potting, and the growing of plants. Make sure to include a detailed description of the photo, such as the growth stage, date, activity or process.***