SEED PROPAGATION PROTOCOL

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

Authorship *(people that contributed propagation information)*: Tanzania Forest Service Agency

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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	*Scientific name of the propagated species*	*Baphia kirkii*	**Name/s of propagator/**	*Name(s) of the person or people that carried out the propagation*	
Family	*Plant family of the propagated species*	Fabaceae	**Organisation**	*Organisation(s) where the propagation was carried out*	
Origin of seeds	*Site(s) and country where seeds were collected*	• Coastal Region, Tanzania • Morogoro Region, Tanzania	**Site and country**	*Site(s) and country where the propagation took place*	Rondo nature reserve in Lindi Coastal Forest and Kisarawe Coastal Region, Tanzania Morogoro Region, Tanzania

SEED DESCRIPTION & PROCESSING		
Description of the seeds and the processing of the seeds before seed sowing.		
Time of year for seed collection	*List month/s of the year when seed collection is best*	• August – November (main dry season) • Sometimes December depending on locality

Fruit/seed transport	*Describe how fruit/seeds have been stored during transport from the field to the nursery*	• Collect mature yellowish-brown pods directly from trees or shortly after natural seed fall. • Place fruits in clean cloth, paper, or hessian bags to allow aeration. • Keep fruits in cool, dry, and shaded conditions during transport. • Protect fruits from direct sunlight, rain, and excessive heat. • Transport to the nursery as soon as possible to maintain seed quality and reduce fungal or insect damage.
Processing of fruits/seeds	*Describe how the fruits/seeds are processed in situ or in the nursery (seed extraction methods, seed cleaning, handling of fruits/seeds...)*	• Dry collected pods under the sun for 2–3 days to facilitate opening. • Manually split pods or lightly thresh to extract seeds. • Remove pod fragments, debris, damaged seeds, and other impurities. • Sort healthy seeds and discard defective ones. • Store clean seeds in labelled containers indicating species name, collection site, date, and seed lot number. • Approximately 10 kg of fruits yield about 1 kg of clean seed.
Method to assess seed viability	*Describe method used to estimate seed viability (e.g. floating test, cut test, tetrazolium test, X-ray test)*	• **Cut Test:** Cut seeds longitudinally and examine embryo condition. • Viable seeds possess a firm cream-white embryo. • Non-viable seeds are empty, damaged, shrivelled, or discoloured. • **Floatation Test:** Place seeds in water; viable seeds generally sink while empty or damaged seeds float. • **Tetrazolium Test:** Treat embryos with tetrazolium chloride solution; living tissues stain red indicating viability.
% Estimated seed viability	*(Number of viable seeds) x 100 / (Total number of seed for which viability was estimated)*	Typical viability: 60–85% when fresh.
Type of seed	*Choose one of these options: Orthodox, Intermediate, Recalcitrant or Unknown*	• Orthodox. Seeds tolerate drying and can be stored for extended periods without significant loss of viability. • Suitable for medium- to long-term storage under dry conditions.
Seed size	*Include a measuring unit (e.g. mm, cm…)*	• Shape: Almost egg-shaped and convex on both sides. • Colour: Dark brown with a hard seed coat. • Distinctive feature: Prominent white scar. • Length: Approximately 1.7 cm. • Width: Approximately 1.2 cm.
Number of seeds per gram	*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)*	• Approximately 1,000 seeds per kilogram. • Equivalent to approximately 1 seed per gram. • Actual seed number may vary slightly depending on seed size and moisture content.
Seed storage	*If seeds have been stored before germination, mention storage facilities (seed bank, fridge, freezer), and describe conditions (humidity, temperature), type of*	• Storage behaviour: Orthodox. • Storage facility: Dry storage room. • Temperature: Approximately 15°C • Relative humidity: 15%. • Container: Airtight glass jars, sealed blue plastic containers, or moisture-proof laminated foil packets.

	container, and storage time length.	• Storage duration: Up to 3 years with minimal loss of viability. • Keep seeds dry and protected from insect infestation. • Avoid direct sunlight and excessive heat. • Silica gel desiccant may be used to maintain low seed moisture content during storage.

+ ***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**	*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.*	Seeds have **hard seed coat dormancy**. Recommended treatment: **Hot Water Treatment:** • Pour boiled water over seeds. • Soak as water cools for 12–24 hours**.** OR **Mechanical Scarification:** • Nick seed coat with knife or sandpaper before soaking.
	Seed sowing media	*Media composition: include percentages/ratio for the different components*	Recommended mixture: Tree Seeds Production Station -Morogoro • 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	*Describe size and material of the container in which seeds are sown*	Seed trays (plastic) and Black polyethylene bags of height 8–10 cm and diameter 101.4 mm or 4``
	Seed spacing	*Describe the recommended spacing between the seeds when sown. Include a measuring unit (e.g. mm, cm…)*	4–5 cm between seeds
	Seed depth	*Describe how deep the seeds are sown. Include a measuring unit (e.g. mm, cm…)*	Sow at 1–2 cm depth or twice tehe size of the seeds

	Watering technique	*Describe watering tool, technique and frequency during sowing and germination*	• Fine holes watering can • Light watering once daily • Avoid waterlogging
	Germination facilities	*Describe the facilities where the germination of seeds took place (e.g. close case, outdoor shaded area, heated bench, covered/bagged container...)*	• Nursery shade house (50% shade net) • Raised germination seedbed
	Environmental conditions	*Describe the environmental conditions where germination took place (temperature, humidity, and photoperiod)*	• Temperature: 20–30°C • Relative humidity: 60–80% • Partial shade
Success	**Time of year for seed germination**	*List month/s of the year when seed germination is best*	1. **Northern & Eastern Zone** • October – December • March – May 2. **Central Zone** • November – April • May – October 3. **Southern & Western Zone** • November – April
	Duration until germination	*Average number of days/months/years until seeds germinated*	10 -30 days
	% Germination success	*(Number of seeds germinated) x 100 / (Total number of seeds sowed)*	Germination is epigeal good and moderately uniform reaching 25% after 15 days and 80% after 30 days
Materials		*List the materials needed for seed germination to help with the planning of this activity. E.g. trays, sieves, dibbers, labels, ruler…*	• Seed trays • Potting media • Hot water container • Watering can • Labels and marker • Shade net

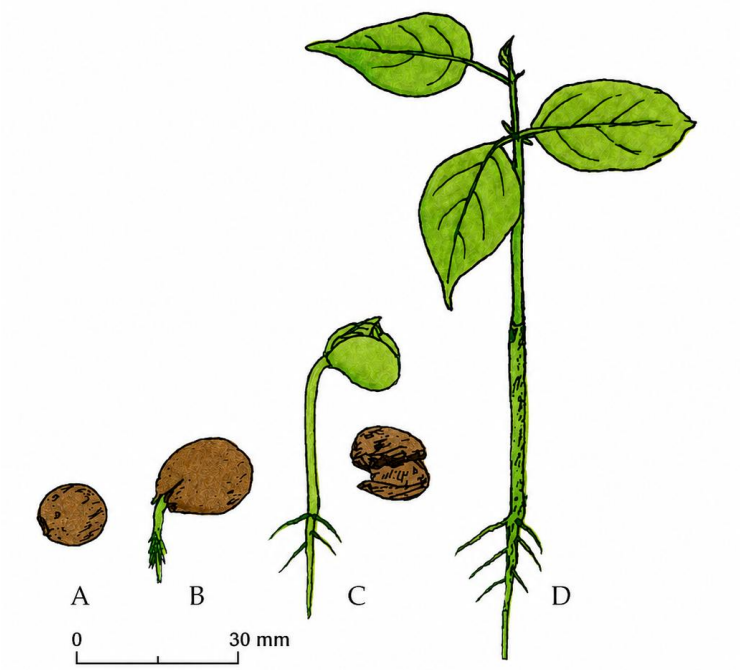
+ ***Add photographs of the germination process. Make sure to include a detailed description of the photo, such as the growth stage, date, activity or process.***

SEED PROPAGATION PROTOCOL

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**	*Media composition: include percentages/ratio for the different components*	Recommended mixture: Tree Seed Production Station-Morogoro • Top Black Forest soil – 63% (5) • Well decomposed Manure – 25% (2) • Rice husk – 12% (1) **Ratio is 5:2:1**
	Container	*Describe size and material of the container in which plants are potted*	Black polyethylene bags of height 8–10 cm and diameter 101.4 mm or 4”
	Fertiliser	*If used, include: type (organic or inorganic); nutrient composition and its ratio; and application (added to soil, dissolved on water, foliar application)*	After transplanting: Type: • Organic compost preferred OR • NPK 15:15:15 Application: Mixed in soil or diluted liquid feed every 2–3 weeks
	Watering technique	*Describe watering tool, technique and frequency while growing the plants*	• Watering can or hose with fine nozzle • 2–3 times per week • Reduce watering during hardening stage
	Plant growing facilities	*Describe the facilities where the plant growing took place (e.g. glasshouse, outdoors, shaded area...)*	• Shade nursery during early stage • Gradual exposure to full sunlight
	Environmental conditions	*Describe the environmental conditions where the plant growing took place (temperature, humidity, light levels)*	• Temperature: 20–30°C • Moderate humidity • Increased sunlight after establishment
Success	**Number of days until first potting**	*Average number of days since the start of seeds sowing until first potting*	60 days
	Duration until established plants	*Average number of days/month/years for which the plant growth was monitored until the establishment of plants*	5–6 months in nursery before field planting
	% Plants established	*(Number of plants established) x 100 / (Total number of plants potted)*	Typical: 75–90%

	Health observations	*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….)*	• Damping-off (germination stage if overwatered) • Caterpillars feeding on leaves • Occasional aphids • Yellowing leaves (nutrient deficiency) Good drainage and hygiene minimize issues.
Materials		*List material needed for potting to help with the planning of this activity. E.g. pots, dibbers, labels…*	• Poly pots (12 × 20 cm) • Potting mix • Dibber • Labels • Watering can

+ ***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.***



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+ Stages of seed germination and early seedling development of *Baphia kirkii*.
+ (A) Seed at the time of sowing; (B) germinating seed 10 days after sowing, showing emergence of the radicle; (C) young seedling 20 days after sowing with developing root system and emerging shoot; and (D) established seedling 60 days after sowing, showing well-developed leaves, stem, and roots. Scale bar = 30 mm.