**Terminalia arjuna** (Roxb. ex DC) Wight & Arn

**Botanical description**

*Terminalia arjuna* is a large evergreen tree with a spreading crown and drooping branches, buttressed and fluted stem. The tree may reach up to 40 m in height and girth of 3.6m (115 cm DBH). Bark is thick, smooth, exfoliating in thin irregular sheets, green when freshly exposed, turning grey or pinkish green. Leaves are sub-opposite oblong or elliptic, coriaceous, usually, 5-25 cm long and 4-9 cm wide; apex cordate, shortly acute or obtuse, base rounded. The petiole is short, sericeous, with one or two glands. Flowers are arranged in short axillary spikes or small terminal panicles, 9-13 cm long with 2.5-6cm long side branches. The rachis is short, white pubescent, lower receptacle is short, sericeous, upper receptacle long glabrous except at base where it is slightly pubescent.

**Fruit and seed description**

Fruits are 2.5 – 5.0 cm long, ovoid or ovoid-oblong, dark brown to reddish brown, fibrous, woody, indehiscent drupes, glabrous with 5-7 equal, hard raised ribs (wings), single seeded. Since seeds are not extracted, the fruits are functionally the same as the seeds. About 175 to 450 fruits weight one kg.
Flowering and fruiting habit
The tree starts bearing fruits 6-7 years after planting when they are 4-6 meters high. Flowering occurs shortly after fruit fall. The spikes of flowers appear from April to July depending on the regions, and the fruits ripen in the following February to May, nearly a year after flowering. Generally, good seed crop occur every 3 years. Pollination is entomophilous.

Seed collection
Fruits are collected during April when they turn brown and moisture content reach 6-7%. The method of collection is to clean the forest floor under the tree and collect the fruits by shaking or lopping the branches. Collection can also be done 1 to 3 weeks before natural shedding, when the moisture content of the fruit is still as high as 30-40%. In that case seeds should be dried in shade with proper aeration on cement floor or table top until the moisture content reach 3-5%.

Processing and handling
After collection, fruits are separated from twigs, chaff, etc. The seeds are not extracted from the fruits.

Storage and viability
*Terminalia arjuna* seeds are orthodox. They can tolerate 2-5% moisture content. The seeds can be stored for longer period (more than 5 years) if stored at freezing temperature (0 to -20°C) with low moisture content. Even hermetic storage at room temperature (15-35°C) with 5% moisture content retains their viability up to 2 years.

Dormancy and pretreatment
Seeds are mildly dormant. Overnight soaking with Indole-3 acidic acid (IAA) at the dose of 500 ppm induce better germination capacity and speed. Pretreatment can also be done by soaking 8 hrs in cold water and placing them in a germinator at 40°C after wrapping them in a moist paper towel. Pretreated seeds take 8-12 day to start germination and complete within one month, whereas in untreated seeds germination starts in about 20 days and completes in two months. Germination capacity of treated seeds is 60-70%.

Sowing and germination
The species can be propagated by direct sowing or planting nursery raised seedlings. Large (heavier) seeds show better germination. In direct sowing, fruits are sown in lines 3-4m apart in June-July with the onset of monsoon rains. Seedlings can also be raised in nursery from pre-germinated seeds sown in polythene bags or in lines.

Phytosanitary problems
The fungi, *Polystrictus affinis* causes white fibrous rot and *Phyllactinia terminalae* powdery mildew disease. The insect *Triozia fletcheri minor* that breeds April to December feeds and damages the leaves. Spraying Bidrin 0.1% and dimethoate 0.2% during the non-breeding season proved to be effective in its control. The larvae of *Apoderus tranquebaricus* feed in nursery and young ones and destroy the entire flush of new leaves. Seed can be damaged by the bird *Psittacula Krameri* (Rose-ringed parakeet).

Selected readings

www.worldagroforestry.org/treedb/.../Terminalia_arjuna.PDF

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