Agroforestry Facts
Lakshmi Taru

Botanical Name	***Simarouba glauca*** DC.
Name in English	Simarouba
Name in Kannada	Lakshmi taru
Family	Simaroubaceae
Seeds Collection	Fruit to be harvested from February to April. Seeds needs to be separated from fruit.
Seeds Processing & Treatment	Pre-treatment is generally not necessary, since it does not have any dormancy. However, soaking in water for 12 hours may enhance the germination of seeds.
Nursery	Sowing in Polybags: Under test condition, seeds are germinated in sand at fluctuating 35-40°C and 12 hours light and other dark condition. In the nursery, seeds are sown in a bed or directly in containers. Freshly collected seed could be sown directly in the container. It normally germinate on the soil surface, since, the seed germination is epigeous. For raising container seedlings, fill the polybags (15 x 25 cm size) with the nursery mixture (soil: sand: FYM in the ratio 3:1:1) sow the seed in the bags@ 1 seed/bag. The seed start germinating on the 15th day after sowing and takes 25 days to complete germination. The germination rate of

	Simarouba varies between 60 to 80 per cent depends on the locality factors. Hence, to ensure higher viability of the seeds, sowing the seeds within six months of collection is highly recommended. Pre-soaking the seed for 24 hours in cold water and removal of endocarp will also increase its germination capacity. Sowing in Mother Bed: A raised nursery bed has to be prepared at a size of 10 m x1 m. The seeds are generally sown in lines. Usually the lines are made at 10 -15 cm apart and the seeds are sown in 3 - 5 cm apart. The depth of the sowing should be 2 - 4 times the diameter of seeds, and ensure that the seeds are just covered with soil. Pricking out: When the seedlings are 7-10 cm tall with taproot about 15 cm long (40-50 days after sowing) they are ready for transplant. Pricking out of seedlings is generally done into polythene bags. The polybag size is generally 10-22 cm or 15-22 cm (200 gauge thickness). The soil mix used to fill the bags consists of garden soil, sand and compost in the ratio 1:1:1. The mixture is thoroughly pulverized and sieved. The bags are watered twice in a day. Since, the taproots grow faster than the shoot, frequent shifting of seedling should be done to prevent the roots from striking the ground. Six months old seedlings are ready for out planting. Application of biofertilizers may enhance the quality of seedlings and reduce the nursery period. Studies at Forest College and Research Institute have shown that stumps prepared from 10-12*months old plants with 2.5 cm of shoot and 20 cm of root have given good establishment. Such type of stump planting is advocated for moist locality.
Plantation Management	It grows well up to 1000m MSL. The temperature of the species is 17-35°C with an annual rainfall of 500-2200 mm. In all types of well-drained soil with pH 5.5-8.0. However, a minimum of 1.0 m deep soil is preferred for its growth. Soils of shallow depth with canker underneath are relatively unfavourable for its growth. Six months old seedlings are suitable for planting in the main field. The field preparation should be done during June-July with the help of southwest monsoon.

	Seedlings are planted at a space of 6 x 6 m (277 trees/ha) in pits of 45 x 45 x 45 cm size half filled with top soil and 2.0 kg compost + 20 g phosphorus + 20 g nitrogen. The plans grow well with protective watering. Pitting may be done during September and planting should be taken up with the onset of northeast monsoon i.e. during October. Every year ploughing and crescent basins formation to be taken up prior to the onset of the monsoon to harvest rain water and in turn to induce flowering and fruiting. Timely weeding in the first two years helps the better establishment of saplings.
Model/Spacing	Ideal spacing of 6 x 6 m.
Pests, diseases and Management	There are no serious diseases of Simarouba plants. In nursery, the seedlings are affected by damping-off and wilt diseases, which are generally controlled by proper drainage and application of fungicides.
Plant Rotation	10 – 15 years.
Yield	The tree starts flowering and fruiting at about three years of age. Flowering is annual beginning in December and continuing up to February. The tree starts bearing when they are 4-6 years old and reach stability in production of another 4-5 years. Even though bearing commences in the 3rdor 4thyear, the tree gives the economic yield of 20 kg/tree from 10thyear onwards. 1000 – 2000 kg/ha/year
Uses	All the parts of Simarouba are useful in one-way or the other. The seeds are considered economically important as they contain 50-65 per cent edible oil, which can be used in the manufacture of vanaspati. As industrial oil, it is well suited for the manufacture of quality soaps, lubricants, paints, polishes, pharmaceuticals, etc. The pressed cake resulting from the milling operation contains a very high percentage of protein (64%) and can be used as a cattle feed after the extraction of toxic elements. The pressed cake is also being utilized as organic fertilizers. The filtered crude oil can be used to blend with diesel@ 5-10%. The surplus oil produced can be subjected to transesterification to manufacture biodiesel, a 100% substitute for diesel.
Buyers /Industries	Silver Roots Argo, Mumbai Maharashtra, World-wide enterprises, Calcutta
Harvesting	The droplets (blackish purple in pink genotypes and brownish yellow in green genotypes) are ready for

	harvest by March/April. Immediately after extraction seeds must be dried in shade for few hours followed by sun drying to reduce the moisture content. The surface moisture of the seeds should be removed immediately after de-pulping and washing by drying them. If the rooms are humid and closed, then use of fan, air blower. The seeds should always be spread in a single layer and should not be heaped for uniform drying. The initial moisture level of the seed is 12-15 per cent.Seed is orthodox and if stored at low temperature, it will retain high viability for several years. If the seed is stored in paper/cloth bags at room temperature, 9-12 months storage can be expected without loss in viability. Germination of fresh seed is 70-80 per cent. The seed coated with pulp in a thin skinny epicarp needs to be separated, sun dried and stored till crushed for oil extraction. Any delay in separating the seed and drying, will effects the quality of oil content. The seeds are decorticated before extracting the oil
Economic Returns	From seeds, Rs. 20000 per ha. Timber, Rs. 25000 per ha. Net income of 50000 per ha annually
Current Market Rate	Rs. 4 .kg of seeds.