

cases and crates, etc., canoes and dugouts, oars, cane-crushers, oil pressers and rice pounders.

Fodder : Leaves and twigs are nutrient rich fodder (18.9% protein, 3.3% fat, 39.7% carbohydrate, 1.5% calcium, 0.30% phosphorus, 31.9% fiber and 6.2% mineral ash) for sheep, goat and elephant in Maharashtra, Orissa, Punjab, Tripura and Uttar Pradesh.

Fuelwood : The wood with 6.84% moisture, 89.56% carbon and other organic matter and 3.6% ash, is an excellent fuel, for the dried sapwood and heartwood provides 4870 kcal per kg and 4865 kcal per kg, respectively. Excellent charcoal (39.6%) can be prepared from the wood, and it is widely used as a fuel. Pods and fallen leaves are also considered as potential energy sources.

Fibre : The wood fibre length varying from 0.70 to 1.65mm and diameter from 0.014mm to 0.028 mm is considered to be a promising source of pulp for high quality paper. Bleached pulp in satisfactory yields (50.3%) can be prepared from *A. procera* wood by the sulphate process. It is suitable for writing and printing paper.

Medicinal and other uses : All parts of *A. procera* are reported to show anti-cancer activity and commonly used in traditional medicines. The roots contain alpha-spinasterol and a saponin that has been reported to possess spermicidal activity at a dilution of 0.008%. The leaves are valued as insecticide and for the treatment of ulcers. The bark contains tannins and reddish gum used as a fish poison. A decoction of the bark is given for rheumatism and hemorrhage and is considered useful in treating problems of pregnancy and for stomach-ache. The seeds contain proceranin which

is toxic to mice and rats when administered peritoneally and orally. The intra-peritoneal LD₅₀ for mice is 15 mgkg⁻¹ body weight.

Agroforestry and N₂ fixer : *A. procera*, widely planted for its good soil-binding capacity and occasionally cultivated as shade tree for tea and coffee plantations. *A. procera* fixes atmospheric nitrogen and enriches soil fertility for the benefit of the crops.

Economics : Evaluation of a 20 year rotation period of *A. procera* plantation reveals benefit/cost ratio to be 1.21 at 15% discount rate and internal rate of return to be 19%.

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SAFED SIRIS *Albizia procera* Benth.



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Introduction

Albizia procera, white siris or safed siris (Family: Mimosaceae), is a large and fast growing tree, attaining usually 60-70 cm diameter and 25m height and is adaptive to diverse geo-climates. Mature individuals possess tall clear, erect or curved trunk and large branches with spreading crown and stout taproot system. Bark is nearly smooth, whitish to light greenish, gray or light brown and exfoliates in thin flakes with red undersides. The leaves of the plant are bi-pinnate and are reddish when juvenile. Flowering occurs in June to September in India. Pods with 6-12 seeds are reddish brown produced in large numbers and ripen in 3-5 months after fertilization.

Silvicultural characteristics

Light: Strong light demander

Soil condition: Poor, marginal, dry and degraded lands

Frost: Frost hardy

Fire: Susceptible

Coppicing power: Vigorous coppice producer

Nursery and planting practices

Site preparation, seed collection and sowing: Nursery beds shall be of sandy loam soil with pH around 7.0. Seeds should be collected from diseased free ripen pods and dried in sunlight. Seeds retain viability for a long time. Seed sowing should be done in April after 24hrs soaking in hot water. Germination starts in 3-4 days and 90% germination may be observed depending upon seed condition. Seedlings attain a height of 1.5-2.0 feet within three months. Seeds can be sown in lines about 8 cm apart and the seedlings are spaced about

5 cm in lines. Pricking out seedlings with two pair of leaves in polybags filled with soil, sand and FYM.

Preparation of stumps: Stumps prepared from one year old plant yield better results.

Site preparation: Species prefer alluvial soil. It also comes up in clayey or moderately alkaline and saline soils. Pits of 30 cm x 30 cm x 30 cm size should be dug before summer season. Pit size should be larger for alkaline and saline soils. Vermiculite, gypsum and FYM may be added with soil for better results. Pit digging is not necessary in wet climates as in Assam, as stump planting in crowbar holes is fairly successful.

Planting: Seedlings as well as stumps shall be planted in previously prepared planting pits with the break of monsoon showers. Better survival is recorded in block plantation with a spacing of 2m x 2m or 3m x 3m both for seedlings and stumps. Around the agricultural field the species can be planted in a single row at 3m or 4m spacing.

Protection

Browsing: The seedlings and saplings are browsed by the sheep, goat and elephant. Effective fencing is must for protection of plants.

Pests and insects: *A. procera* attacked and defoliated by insects, viz. *Eurema blanda*, *Selepa celtis*, *Spirama retorta* and *Rhesala* spp. during the month of June to September. A foliar spray of monocrotophos 0.04% is recommended for prevention. The termite *Coptotermes curvignathus* is reported as a pest of the tree. The larvae of *Xystrocera globosa* bore into the inner bark and sapwood. Spraying a mixture of para-

dichlorobenzene 1 part and kerosene 10 parts kills the larvae. The tree is also susceptible to root rot caused by *Ganoderma lucidum*. Seedling wilt is caused by *Fusarium oxysporum* and is controlled by application of 0.3% Dithane M-45. Stem canker at the age of 15-20 is caused by *Fusarium solani*. Application of 0.3% Fytolan is effective to control the disease. Leaf rust caused by *Ravenelia sesstlis* is of common occurrence and can be controlled by the foliar spray of 0.2% sulfex.

Regeneration

The species exhibits natural regeneration by seeds and coppice. It is a difficult to root species. The artificial regeneration is possible through following methods:

- Seeds
- Coppice
- Air layering in rainy season
- Micropropagation by axillary buds under aseptic tissue culture conditions
- In vitro adventitious shoots by leaflets under aseptic tissue culture conditions
- Juvenile shoot cuttings by adventitious root formation in the presence of 100ppm IBA for 4h in the last week of September in high mist conditions (70±5% RH and Temp. 30±2°C)

Uses

Timber: Durable, strong and termite resistant light to chocolate brown wood (specific gravity: 0.6-0.9) with interlocking grains suitable for large sized panels, table tops, etc. as well as for construction (house posts, beams, planks, boards), wooden bodies of carriage and carts, motor-lorry and bus, agricultural implements, tool handles, packaging