

Sal

Subjects: [Forestry](#)

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Scientific name: *Shorea robusta* Gaertn. f.

Family: Dipterocarpaceae

Centre of origin: Southern Asia

Common name: Sal, Sakwa, Sakhua,Shal, Borsal, Sagua, Sakhu

Sal

propagation

management

agrogorestry

1. Introduction

S. robusta is a hermaphroditic, self-incompatible species. A large gregarious tree, seldom quite leafless with shining foliage; the mature leaves are coriaceous, ovate-oblong. In wetter areas, is [evergreen](#); while in drier areas, it is dry-season [deciduous](#), shedding most of the leaves between February to April, leafing out again in April and May. It is a moderate to slow-growing species with a height extending up to 30-35m while a trunk of a diameter of about 2-2.5 m. Crown conical or elongated in youth afterwards rounded with a strong branch system. The bark of saplings is brown, smooth, with a few deep longitudinal cracks; that of older trees is dark brown, thick, rough, with deep longitudinal furrows. It is a light demander species but able to persist in moderate shade.

2. Distribution

The Sal occupies two regions separated by the Gangetic plain, the northern and the central Indian regions. Its ranges are extending from Bengal, Assam, Jharkhand and Odisha to the Shivalik Hills of Haryana and eastern parts of Yamuna. The range can also be seen extending through the Eastern Ghats and to Vindhya's eastern region as well as the range of Satpura in the central parts of the country.

3. Uses

leaves are used to make platters, bowls, small baskets and many more. dried and fallen leaves are used as fertilizers. It is used for caulking ships and boats. The oil that comes out from its seed is edible and is known as Sal butter. It is often used in cooking and for burning oil lamps. The seeds of the Sal tree are used for fat extraction. Its oil is even used for adulterating ghee. Tribal people give marriage invitations in the form of folded Sal leaves, with a little bit of turmeric and rice inside it. Timber is very durable and highly resistant to termite attack.

4. Agroforestry systems

- Sal + Acacia—Pineapple+ Mustard
- Sal + Acacia—Pineapple + Papaya
- Sal + Acacia— Pineapple + Banana
- Sal + Acacia— Pineapple + Banana + Papaya
- Sal + Mangium— Pineapple + Papaya
- Sal + Mangium— Pineapple + Banana
- Sal + Mangium— Pineapple + Banana
- Sal + Mangium + Acacia— Pineapple + Banana
- Sal + Mangium + Acacia— Pineapple + Papaya
- Sal + Mangium + Acacia— Pineapple + Banana + Papaya
- Sal + Arjun + Acacia—Cotton
- Sal+ Bahera+ Acacia+ Mangium— Pineapple + Banana+ Papaya

Sal based agroforestry systems are highly economic. A study carried out in West Bengal by Roy, 2008 found that sole sal tree gives the total return of 11,653 Rs per ha while when sal is intercropped with crops like cowpea, rice, black gram and groundnut; the total returns are increased by 14674, 20097, 26882 and 29020 respectively.

5. Site Factor

5.1 Climate

Sal is a hardy tree as regards climate. It can stand frost to some extent and grows well in areas with a maximum summer temperature of 44-47°C and an optimum temperature of 22-27°C. It is found in the altitude ranges of 100-1500 m MSL and annual rainfall of about 1000-3000 mm.

5.2 Soil

It flourishes best in deep, well-drained, moist, slightly acid sandy to clayey soils. It does not tolerate waterlogging. The most favourable soil is a moist sandy loam with good subsoil drainage. Availability of soil moisture is an important factor determining the occurrence of Sal.

6. Propagation techniques

Sal can be propagated through seed as well as coppice method. Through seeds, there are some problems and these are as follow;

- Short viability of Sal seeds.
- Sal seedling and Saplings have a root shoot ratio of 3:1 and after 5 months it is 6:1.
- Sal seedling and Sapling are moisture Sensitive.

6.1 Collection of Seeds

Sal seeds mature in the month of June. Fresh mature seeds are collected. Fresh collected seeds are germinated in warm and moist conditions. Seeds are kept under jute bags; moisture is maintained by spraying water.

6.2 Nursery techniques

Seeds are germinated in a nursery providing warm and moist conditions. Seeds germinate in 7 to 10 days. Early transplantation of germinating radicals in poly bags having pot mixture (Soil+ Sand+ Fym etc) 2:1:1 is done to prevent root damage. Because the root shoot ratio is high. It gives root coiling. To prevent root coiling of primary root poly bags are given special treatment. The bottom ends of poly bags are cut smoothly to open the bottom end. Clay soil is pasted at the bottom end to protect the potting mixture in the poly bags.

Irrigation: - To fulfil the moisture requirement of seeding and sapling regular watering from September onwards done once a day and after December twice a day. Green net shade is given in peak winter and summer to the plants. In the next June, sapling size grows to the height of 30 cm. to 60 cm.

6.3 Plantation

The site is prepared in advance. The area is fenced pits are dug. Pit size 45×45×45 cm. Per pit FYM 2 kg, neem cake powder 100 gm is given. One-year-old saplings are planted on site. Just after the end of the rainy season irrigation either drip or flood is given to the plants. Regular watering is done. 250 ml./per plant/ alternate day and in summer 500 ml./plant/alternate day. After one year Sal plantation has more than 95% survival with vigorous growth. Average height 1 meter having collar girth 9 to 12 cm.

6.4 Management

Thinning: - Young plants grow quickly, attaining top heights of up to 6 m after 6 years. The 1st thinning is usually performed after 5 years, and thereafter the trees are thinned every 5-10 years.

PESTS AND DISEASES:- *S. robusta* is beset by a number of pests and diseases. Among the insect pests in India, *Hoplocerambyx spinicornis* is the most destructive. Its larvae tunnel through the bark, sapwood and finally to the heartwood, causing the death of the tree. The population of the pest keeps building up and if not checked may assume an epidemic level. Other insect pests include *Diacavus furtivus* and *Xyleborus* spp. The major fungal diseases include those caused by *Polyporus shoreae* and *Polyporus gilvus*. The semi-parasite *Loranthus scurrula* can also cause increment losses.

Through Coppice: - Rotations of 30-40 years are used when coppicing regeneration

Intercropping: In Assam, India, artificial regeneration of *S. robusta* is practised in combination with crops such as upland rice, maize, sesame and mustard. Good results have also been achieved with mixed plantations in which *S.*

robusta is cultivated together with Teak.

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