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Sea Buckthorn (*Hippophae rhamnoides*)-Hardy, Deciduous Spiny Shrub

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Sea Buckthorn - *Hippophae rhamnoides*
Family: Elaeagnaceae
Origin: China and Europe
Common Names: Sea buckthorn, Siberian pineapple, Sea Berry, Sand thorn, Swallow thorn



Health benefits

- Treat stomach or intestinal problems
- Improve blood pressure or blood cholesterol
- Prevent or manage blood vessel or heart disease
- Complement cancer treatment
- Boost immunity and prevent infections
- Treat obesity
- Improve symptoms of cirrhosis
- Improve eyesight or dry eyes
- Treat respiratory problems such as asthma, colds, and pneumonia

Botany

Sea buckthorn is a hardy, fast growing deciduous tree-like shrub, between 2 to 4m tall, with yellow or orange berries. It has brown or black rough bark and a thick greyish-green crown. Leaves are alternate, narrow, and lanceolate with a silver-grey colour on the underside. It is an ideal plant for soil erosion control, land reclamation, wildlife habitat enhancement, and farm shelterbelt protection, with nodule rooting capability of fixing nitrogen from the atmosphere.

Soil

Sea buckthorn is found growing profusely on a wide range of soil types, but does better in soils with a light physical structure, rich in nutrient compounds, with a pH near neutral (pH 6.5-7.5). Best growth occurs in deep, well drained, sandy loam with ample organic matter.

Climate

It can withstand extreme temperatures from –43° to 40°C and is considered to be drought resistant. However, irrigation is needed in regions receiving less than 400 mm of rainfall annually

Varieties

Three high yielding selections, namely FRL Selection-1, FRL Selection-2 and FRL Selection-3 are being cultivated. Less thorny, big fruited and short duration introductions from abroad are being evaluated at Kukumseri, Lahaul valley of Himachal Pradesh and at Leh (J & K).

Propagation

Sea buckthorn can be propagated through Seeds, Cuttings and suckers

Seed: Sea buckthorn can be propagated successfully by seeds which are viable for a period of two years. The seeds are small (4.5 mm in length) with brown and hard seed coat. One gram may contain about 100-105 seeds. Freshly harvested seeds have a short physiological dormancy and thus cannot germinate immediately after harvesting. May month is the best time for sowing. Seed has germination of 85%.

Hardwood cuttings: commercial method of propagation. One- to two-year-old stem cuttings having pencil thickness are ideal for its propagation. The best time for taking cuttings is in the month of March. The side branches and thorns are removed to make 30 cm long cuttings. The cuttings are then placed in running water for a period of 2-3 days. Sea buckthorn cuttings are not easy to root on their own, thus Indole Butyric Acid @ 500 ppm is applied for rooting.

Softwood cuttings: The softwood cuttings using 200-300 ppm NAA is used for propagation. The technique has yielded over 90% rooting in cuttings with excellent root quality under mist condition having coarse sand as rooting medium. The plantlets get ready for transplantation in polybags within 90-100 days after planting of cuttings. This method is much faster than hard wood cuttings.

Planting

Single or double hedge row systems can be adopted which provides enough space to approach each plant easily for training, pruning, harvesting and other cultural operations. In single hedge row system, the distance between rows is maintained at 2-4 m for pure cultivation and 4-5 m for intercropping. The sea buckthorn plants are normally planted in rows at a distance of 1 m. Male and Female ratio 1:6

Irrigation

Sea buckthorn can tolerate a little drought but it is a moisture sensitive plant especially in the spring when plants are flowering and young fruits are beginning to develop. Planting in arid or semi-arid areas, water must be supplied for establishment.

Flowering

Sea buckthorn is dioecious, with separate male and female plants. Flowers are unisexual. Male flowers are minute, solitary and axillary in clusters of 14 – 15 flowers produced during end of April. Female inflorescence is solitary, axillary clusters or racemose having 3 – 18 flowers produced during May. Cross pollination is observed. Pollinating agent wind AND insects.

Plant protection

Disease

In India, there are very few reports on the diseases of sea buckthorn. Root-rot caused by *Rhizoctonia solani* in nurseries at Gangotri and Ranichuri in Uttarakhand, *Veticilium sp.* and *Fusarium sp*. infesting sea buckthorn have been observed.

Insect-pests

Death-hawk moth *(Acherontia styx***)** causes serious damage to sea buckthorn. Defoliating beetles (*Brahmina cariacea*) have been noticed. *Holotrichia ongipennis* damages early growth of sea buckthorn. Indian meal moth, *Plodia interpuntella* damages sea buckthorn fruits during storage.

Harvesting

Vegetative propagated sea buckthorn plants normally start bearing fruits at the age of 3-4 years after plantation, while seedlings take 5-6 years to come into fruiting. Sea buckthorn orchard starts commercial production only after 8 years of plantation. Sea buckthorn is a non-climacteric fruit which ripens on the plant and cannot ripen after harvesting. Maturity indices of the crop have not been worked out. Ripening of fruits generally sets-in by mid to end August under Ladakh and Lahaul conditions. Ripening of fruits can be judged on the basis of surface

colour, texture, juice content and total soluble solids. A sharp increase in the TSS of the fruits has been recorded after ripening and it reaches 12° Brix and even above.



Yield

Yield of sea buckthorn plant varies according to the age, management practices adopted and variety. Cultivated varieties yield about 10-15 tonnes/hec. fruits, under properly managed orchard conditions. However, under Ladakh conditions, yield of the ripe fruits ranges from 0.6- 2.0 kg per plant, since plants are growing wild under natural conditions. About 200-300 q of the fresh leaves can be harvested per hectare per year after 8 years of plantation.

Storage

Storage and distant transportation of ripe fruits the recommended temperature is 4-6°C to reduce post-harvest losses. Quick freezing of fruits and storage at -20°C has also been found effective for long-term storage of fruits.

Value addition

Sea buckthorn products are juice, beer, wine, jam and preserves, compote and tea (from leaves). Essential oil from seeds and berry pulp are the most valuable product which has medicinal values.

Teas

Sea buckthorn leaves contain nutrients and bioactive substances. These include flavonoids (Chen *et al.* 1991), carotenoids, free and esterified sterols, triterpenols, and isoprene's (Goncharova and Glushenkova 1996). Numerous products can be made from the air dried leaves including teas and tea powders

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