SPOTLIGHT SPECIES ON *AZADIRACHTA INDICA* (NEEM)

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Azadirachta indica A. Juss.

Family: Meliaceae

Neem plant is receiving considerable international recognition for its multiple uses. The tree is fairly fast growing, deeprooted, broadleaved, semi-evergreen and large-sized with a wide spreading branches forming rounded or oval shaped dense crown. It attains a height and girth of about 12-15m and 1.8-2.7m respectively (Parker,1921; Troup, 1921). It has moderate, thick grey bark (1.2-2.5 cm) and reddish hard and durable heartwood (air dried specific gravity 0.72-0.83); leaves are compound, 22.5-37.5 cm long; flowers in axillary panicles, lilac, honey-scented particularly during night.

Distribution

This attractive and sacred tree of Hindus is native to the dry forest areas of Indo-Pakistan sub-continent. It is found in Bangla Desh, China, Burma, Sri-Lanka and Malaysia. It is cultivated as well as naturalized in Thailand and Indonesia; introduced in Saudi Arabia, Sudan, Mauritania, Senegal, Gambia, Ivory Coast, Burkina Faso, Mali, Benin, Niger, Togo, Cameron, Chad, Ethiopia, Somalia, Kenya, Mozambique, Siera Leone, Malawi, Zimbabwe, Tanzania, Zanzibar, Guinea, Nigeria and Ghana. It is actively being introduced in Philippines. It is found in Haiti (Abdullah, 1972; Ahmed *et al* ,1989; Anon,1980; Lewis,1983). In Pakistan, it is wild and cultivated in Sindh, South Punjab (as far east as Sarai Alamgir), Lower Balochistan and Southern N.W.F.P. (Troup,1921). Compact plantations of Neem are not found in the country. However, scattered cultivated trees are found near habitations, railway stations, in schools, playgrounds and along canals and roads.

Environmental requirement

Neem thrives under sub-humid to semi-arid conditions and can be established without irrigation in the warm areas with rainfall less than 300-1150 mm (Ketkar, 1976; Anon,1980; Radwanski and Wickens,1981). It can grow in temperature as low as 1 ^{0}C to as high as 45 ^{0}C. Its altitudinal range varies from 50-1500 m (Anon,1980).

It can grow on dry stony, clayey and shallow even nutrient deficient well drained soils but not on seasonally water-logged nor on deep sandy areas with water table below 18 m, nor well on saline soils (Anon, 1980; Troup. 1921). Optimum pH is 6.2 or above but it can grow well even at pH 5 and can survive up to pH 10 (Chatervedi *et al.* 1985).

Silviculture

It is light demander and highly frost-tender both in seedling and sapling stage. It is propagated through seed, coppices well, withstands pollarding and produces root-suckers especially in dry localities. It can grow along with other crops but cannot compete with grasses. Flowers appear from March-May and fruits ripen in the month of June-August. Generally, fruits are 1.3-2 cm, greenish-yellow when ripe and usually contain one seed (Troup,1921).The tree starts flowering and fruiting at 5 years but yield of fruits is obtained after 10-12 years. A medium sized tree produces 37-55 kg seed (Dwivedi,1993). 3000-4500 seeds weigh a kg (Ahmed,1993). In imperfectly-drained soils, the tap-root tends to rot and the tree gradually dies-off.

Growth and yield

The plants attain a height of 4 m at 5 years and 10 m at 25 years. It has a mean annual increment of 2.3-3.0 m^{3} (Tewari,1993).

Nursery techniques

Viability of neem seed is very low, hardly 4 weeks. For raising nursery, immediately after collection, the fresh seed should be sown in polythene bags and lightly covered with soil and sparingly watered. The soil should be kept loose to prevent caking. The seedlings will be fit for transplant in the field during the first rains (Troup,1921). In plantations two weedings are sufficient in the first year and one during the second year. The planting should be done according to the objectives but best results were obtained at 2.4 x 2.4 m spacing in Nigeria (Anon,1980).

The major nursery diseases are damping-off, leaf web blight, leaf spotting, and ganoderma

root-rot which can be controlled by adopting sanitation and cultural practices (Tewari,1993).

Seed storage

Before storing, the fruits should be de-pulped and dried in sun light for 3 days (m.c=46%) and stored in a cotton bag at 15 ^{0}C. Seeds retain their viability more than 4 months and give 62% germination (Chaisurisri *et al.* 1986; Maithani *et al.* 1989).

Uses

Neem is an important multipurpose tree species of medicinal, pesticidal and insecticidal properties. Almost all parts of the tree have one or several uses. Its timber is used as poles, in construction, and for furniture, and agriculture implements, idols and in ship building and as good fuelwood; it is an excellent avenue, shelterbelt and shade tree. Leaves and seeds have numerous medicinal uses and act as insect repellent and also control nematodes. Dried leaves are used in protecting books, stored grains and potatoes. Oil from seeds (upto 40%) is used as a lubricant for machinery, in soap marketing and preparation of tooth paste (Anon,1948,1991; Khan,1993; Watt,1891). Bark contains 12-14% tannin. The twigs are used as tooth brush. Seed cake is used as manure and increase the yield of grain and straw (Tewari,1993).

Research needs

- Evaluating growth and fruit harvest under the prevailing climatic conditions and management practices.

  Assessing NPK and other nutrient needs for growth, fruit yield and fruit quality.

  Provenance trials should be established to identify fast growing and high yielding varieties from indigenous and exotic sources.

- Establishment of seed orchards for better quality seed production.

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