Quercus floribunda

Lindl. Ex. A. Camus

Fagaceae

barungi

LOCAL NAMES
English (moru oak,holly oak,green oak); Hindi (tiloj,moru,mohroo); Nepali (thinke,sano phalant,sano pate phalant,phalant,belekharmendo); Trade name (barungi)

BOTANIC DESCRIPTION
Quercus floribunda is a large evergreen tree with a dense crown of shining green foliage, a diameter of up to 1.6 m and a straight bole of up to 45 m long. Bark turning dark grey or dark reddish brown with age and exfoliating in irregular woody scales. The moru oak is the largest of the western Himalayan oaks and it is one of six species of Quercus found in Himalayan regions.

Leaves shiny green, lanceolate to elliptic, 4-8 cm long, acuminate, with the veins branching short of the margin; margin spiny or smooth; leaves hairless beneath. Margin entire or spinous serrate, coriaceous, glabrous when mature.

Male catkins crowded, drooping, lax, up to 7.5 cm long, bracts lanceolate. Female spikes short, to 4 cm long, styles 3-5, linear-clavate.

Fruit an acorn, solitary on previous year's shoots, ovoid or oblong, with a fine point, about twice as long as the cup, about 2 cm long, brown.

BIOLOGY
New leaves and flowering occurs during the March-May period in Nepal. Fruiting follows 16-18 months later. Seeds are ready around August-October.

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ECOLOGY
Its natural range of distribution is the temperate region of the western Himalayas from Nepal westwards at altitudes of 2100-2700 m, descending to about 1700 m in cool moist areas. Although found on all aspects, it avoids very dry situations and favours moist, cool locations on northerly aspects with deep and fertile soil but on shallow gravelly soils, the tree is stunted. It tends to regenerate in dense pure patches, and to grow gregariously in crops of varying extent. It is frequently found scattered in mixtures with coniferous and broad-leaved trees. It is frost-hardy but does not tolerate drought.

BIOPHYSICAL LIMITS
Altitude range: 2100 - 2700 m
Mean annual rainfall: 1100 - 2400 mm
Mean annual temperature: 12 - 17ºC
Soils: light to medium textured, freely draining, acid soils

DOCUMENTED SPECIES DISTRIBUTION

Native: Afghanistan, Bangladesh, India, Nepal, Oman, Pakistan
Exotic:

The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

PRODUCTS
Fodder: Young plants and coppice shoots are readily browsed, particularly by goats. Leaves contain 9.6% crude protein, with a digestibility coefficient of 44%. The total digestible nutrients are 43.2. The trees are extensively lopped for fodder.

Timber: Sapwood thin, grey while heartwood is russet to pale greyish brown with darker streaks, very hard, strong and heavy (wood weighs about 970 kg/cu. m). It has a straight grain but uneven texture, is difficult to season and work. In the western Himalayas, it is used for structural building construction, railway sleepers, dunnage pallets, tool handles, heavy-duty flooring, agricultural implements and door and window frames as well as for fuel and charcoal.

Fuel: It is a good fuelwood and is used for making charcoal.

Tannin: Leaves contain up to 9.8 % tannin and have been recommended as a source of tannin material.

TREE MANAGEMENT
Q. floribunda tolerates shade, coppices well, grows without a massive root system and, therefore, is not wind firm. Under natural conditions seed germinates well soon after falling during and after the summer rains from August to October. It is planted at a spacing of 1.5 x 1.5 m for production of clean stems, as the tree tends to develop strong branches. Seedlings are drought sensitive and growth is moderately fast. A number of insect and fungal pests attack this species. In Jaunsar in India plantations (direct sown) averaged 4.3 m in height after 20 years, which is slow. It tolerates side shade when young, but growth of older trees is better in the open. Best growth is on well-drained clay loam, and on shallow gravelly soils growth becomes stunted. The tree is frost-hardy, but early frosts sometimes kill the seedlings. It does not tolerate drought. It coppices well, until the tree is about 10 cm in diameter; trees larger than this coppice poorly in many localities.

GERMPLASM MANAGEMENT
The seed ripens between August and October, and under natural conditions germinates soon after falling. In a good seed year abundant young natural seedlings will be found near to the seed-bearers, but many may die off during the next dry season, if exposed to the sun. In moist shady places dense thickets of seedlings may develop. Seed storage is intermediate and seeds weigh 500-600 seeds/kg. When stored in sealed tins under cool dry conditions, it can remain viable for up to one year.

PESTS AND DISEASES
A number of insect pests have been reported to attack the foliage, branches and wood of Q. floribunda include Curculio sikkimensis, Cydia molesta, Dicranognathus nebulosus, Gazalina chrysolopha, Lymantria obfuscata and Sitophilus glandium. Among the defoliators is Hipparchus flavifrontaria, Malacosoma indica and Gazalina apsera. Tricentus kamaonensis and T. subangulatus feed on the sap, while larvae of Eucosma dryocarpa bore the acorns. The tree is susceptible to Armillaria mellea root rot.

FURTHER READNG

Baban PK.1985. Silvics of the trees of Nepal. Community Forestry development project.

CABI. 2000. Global Forestry Compendium. CD-ROM. CABI

CSIR. 1969. The Wealth of India: A dictionary of Indian raw materials and industrial products. Vol. 8. CSIR

Jackson JK. 1994. Manual of Afforestation in Nepal. Forest Research and Survey Centre Kathmandu, Nepal. Vol 2.

Luna RK. 1996. Plantation trees. International Book Distributors, Dehra Dun, India.

SUGGESTED CITATION

Orwa C, Mutua A , Kindt R , Jamnadass R, Simons A. 2009. Agroforestree Database:a tree reference and selection guide version 4.0 (http://www.worldagroforestry.org/af/treedb/)