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Science for resilient livelihoods in dry areas

RESILIENT AGROSILVOPASTORAL SYSTEMS

CGIAR RESEARCH INITIATIVE ON LIVESTOCK AND CLIMATE

Addresses the challenges that climate change poses to livestock production, supporting livestock-dependent communities without accelerating greenhouse gas emissions or degrading land, water, and biodiversity.

Managing agrosilvopastoral systems: promoting versatile tree species

Senegalia mellifera (Benth.) Seigler & Ebinger.: A valuable tree that provides numerous resources to local people

Scientific name:
Senegalia mellifera (Benth.) Seigler & Ebinger.
Common names:
Blackthorn, الظبيان
Locations:
West Africa, East, and South savannas & the Arabian Peninsula.

Senegalia mellifera is a perennial small tree or shrub that can reach a height of 9 m. It is very spiny, thorny, low branched, and characterized by a rounded or spherical crown. *Senegalia mellifera* belongs to the family Fabaceae and grows across arid ecosystems in Africa's western, eastern, and southern savannas as well as the Arabian Peninsula, which have mean annual rainfall of 250–650 mm[1]. It thrives on rocky hillsides and sandy soils and grows best in loamy soils and black cotton soils[2]. The tree grows erratically and develops dense thickets. At first, the trunk is grayish brown, then turns purple-black and becomes longitudinally fissured.

The young branches bear claw-like paired blackish spines. The leaves are bipinnate,with young leaves that are bright green but age to a dull grayish-green. The flowers are tiny, bisexual, densely packed, creamy white to yellowish-white, and sweetly perfumed. Fruits are flat pods that grow quickly. Immature pods are reddish and become greenish-white, straw-colored or pale brown at maturity with 2 to 3 seeds.

Senegalia mellifera, a medicinal Acacia tree, employs its stem bark in traditional medicine to treat syphilis and pneumonia[3]. Its stem bark compounds possess antioxidative, antibacterial, sedative, and anti-inflammatory properties, making them valuable in medicine and pharmacology.

Benefits:

- Important feed resource for domestic and wild ruminants
- Fixes nitrogen and enriches the soil
- Creates shelterbelts or windbreaks and can be used as live/dead fence.
- Produces excellent quality honey
- Benefits farmers with firewood, food and quality honey
- Provides valuable shade for livestock when regularly pruned

Senegalia mellifera leaves, Kenya

Senegalia mellifera inflorescences
Photo credit: Sue Musto

Senegalia mellifera pods
Photo credit: Bernard Dupont

Establishment and Management

Senegalia mellifera, flowers during the dry season, typically in August[4]. The flowers are mostly pollinated by insects, especially honeybees, and it takes about three to four months to develop from flowering to fruiting. Each pod produces two to three brows seeds. After maturation, strong winds may spread the pods.

Following a heavy rainfall event, seedlings germinate quickly from January to March of the next year. Direct seeding is the prevalent method of propagation. Under good conditions, the rate of germination can reach 90%[5] and is usually quick after four to five days[1].

Insect attacks, fungal diseases, shriveling and contamination all reduce seed viability. The viability of seeds can be maintained for several years in hermetic storage at 10 °C with 4.5-9% moisture content.

Nutritional Composition

Due to its high protein content, the leaves of *Senegalia mellifera* are browsed by camels and goats but it is not a preferred forage[6]. During periods of scarcity, this tree could be used to feed animals[6].

Senegalia mellifera boasts a nutritional profile characterized by 17% crude protein, 42.5% neutral detergent fiber (NDF), 24.5% acid detergent fiber (ADF), and 10.7% acid detergent lignin (ADL). In terms of mineral content (g/kg DM), it contains 13.9 of calcium (Ca), 1.2 of phosphorus (P), 15.2 of potassium (K), 0.5 of sodium (Na), 41 of magnesium (Mg), and 192 of iron (Fe)[7,8].

Contact

Dr. Mounir Louhaichi, International Center for Agricultural Research in the Dry Areas (ICARDA). M.Louhaichi@cgiar.org
Dr. Mouldi Gamoun, Higher Institute of Arts and Crafts of Tataouine (ISAMT). gamoun.mouldi@yahoo.fr

www.icarda.org

Effective Management

- Deep sandy or gravelly soils are preferred
- Viability can persist for years in hermetic storage at 10°C with 4.5-9% moisture
- Seeds may be sown directly or transplanted
- Young plants are sensitive to cold and frost
- For the first two seasons, young trees must be protected from grazing

Further Reading

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ICARDA's Rangeland Ecology and Forages (REF)

The REF team promotes advances in rangeland ecology and pasture management in the dry areas. This series of factsheets is dedicated to the characterization of promising range and forage species aimed at alleviating the feed gap, limiting water runoff and soil erosion, restoring degraded rangelands and maintaining a healthy ecosystem.