



Dryland Systems Solutions

Producing More with Less

Pastoral and Agro-Pastoral Systems

Managing rangelands: promoting sustainable native shrub species

Fire Bush: the multipurpose sand dune stabilizer

Arid and semi-arid rangelands face increasing climate variability and grazing pressure as the world's demand for food increases. ICARDA is promoting drought-tolerant shrub and grass species as a crucial means of assisting rangeland rehabilitation efforts, helping to conserve rapidly-depleting water resources, and maintain grazing at sustainable levels. The result: a win-win situation for rural communities and the environment.

Fire Bush – or Arta - is an excellent pastoral species for fixing soil and providing a source of protein for livestock. Its wood is highly prized as fuel, as it burns smokeless. It grows in coarse sandy desert soils and is used for grazing, fire wood, sand dune fixation, and pasture rehabilitation. It plays a vital role in the fight against desertification. In addition to being cultivated around desert plantations and used as a wind break, it is also utilised for medicinal purposes and human consumption.

Characteristic of the Saharan zone, Fire Bush is planted for sand dune fixation and pasture rehabilitation. It is a major food source for camels and is also browsed by sheep and goats. Although Fire Bush has low protein levels, its young branches are highly palatable and have total digestible nutrients of 68.29 percent. Growing in areas with less than 100 millimeters (mm) of annual rainfall, Fire Bush can reach heights of up to two meters (m) with a crown diameter of 100 to 250 Centimeters (cm). The shrub has small leaves that are inconspicuous and sometimes reduced to scales. Although its presence is an indicator of fresh water, water deficits can be a factor restricting plant growth and photosynthesis.

The plant has medicinal properties and is used to treat camel scabies. The dried leaves and stems are also chewed to treat toothache, and the plant is also known for its anti-inflammation properties and ability to treat gastric ulcers. The fruits of this plant are also edible to humans: young shoots are used as salad greens or powdered to add flavoring to drinks.



Scientific name: *Calligonum comosum* L'Herit

Common names: Arta, Fire Bush

Location: Extremely Arid Climates of the Saharan and Negev Central Asian Desserts

Fire Bush benefits:

- Ability to survive dry, harsh conditions
- Helps stabilize sand dunes
- Many medicinal uses
- Young shoots edible by humans and livestock
- An indicator of fresh water
- Provide smokeless firewood used for tanning hides
- Forage for camels
- Total digestible nutrients of 68.29 percent.



Seeds are rough and ribbed, between 7 and 8mm long, and 3mm wide.



Bush structures can be upright or spread out, reaching up to 2 m in height.

Establishment and management

Calligonum comosum seeds are spread by wind through the tufts of silky hair at the end of the seed which assist with wind dispersion. Flowers form from December to April, and are bisexual, allowing for the plant to self-pollinate. Seed dispersal occurs during May-June. Seeds can be harvested by shaking the female plant slightly with a cloth to catch the seeds underneath. Fallen seeds can also be harvested on the ground under the crown of the plant. After harvesting, drying may take two to three weeks.

Threshing will eliminate the hair on the seeds using a sieve with 6 mm. To separate the seed from the residues you can clean them manually or mechanically with a selector seed cleaner using the appropriate sieves (9 mm circular shape, 4.5 mm above and below the rectangular shape). Avoid ventilation and washing. Germination is inhibited by light, high temperatures, and close contact with water.

For field seeding, the plant needs to be placed deep into the sand to avoid exposure to light. Germination rates are 71% at 20°C, and decline as the temperature increases. Characterized by a relatively high thermal optimum germination phase, the seeds of this species should be sown in a nursery during warm periods.

Effective maintenance:

- Harvest seeds by shaking the female plant.
- Plant seeds deep in the soil in the field, germination is best in the dark
- Nursery sowing in the warm period is preferable.
- Germination is highest at 20°C and declines at

Rangeland plant factsheets:

This series of flyers is designed to build awareness of sustainable rangeland species among extension workers and those working in the agricultural research and policy sector.

ICARDA's Rangeland Ecology and Management Unit

ICARDA's Rangeland Ecology and Management Unit aims to address the unsustainable use of resources induced by adverse effect of climate change and an increasing demand for food and feed in the dry areas. ICARDA programs promote the enhanced quality and productivity of crop, forage, livestock, and the improved management of water resources through close cooperation with farmers and national researchers.



RESEARCH
PROGRAM ON
Dryland Systems



Contact:

Dr. Mohamed Neffati, Institut des Régions Arides (IRA)
Médenine, Tunisia. Neffati.mohamed@ira.nrta.tn

Dr. Mounir Louhaichi, ICARDA Range Ecology and Management
Research Scientist. M.Louhaichi@cgiar.org