Managing agrosilvopastoral systems: promoting halothytic drought tolerant shrub species

*Atriplex mollis* Desf.: mitigating highly saline soils

Many arid and semi-arid regions in the world have soils and water resources that are too saline for most common conventional crop and forage systems. The distribution of the genus *Atriplex* in arid and semi-arid areas and its abiotic stress tolerance combined with the utility of *Atriplex* species for restoration, remediation, and forage for livestock have helped these plants to rank among the most widely studied native stress-tolerant species.

**Benefits:**
- Easy and quick to establish
- Potential fodder plant for use in reclamation of saline areas
- Grows in semi-deserts and dry steppes, adapted to sand and dunes
- Adapted to saline-alkaline soils and extremely arid habitats
- Used for soil conservation purposes
- Has medicinal properties
- Good livestock feed due to its ability to regenerate after winter cutting

*Atriplex mollis* is one of the species especially recommended for arid zone restoration projects, with its use associated with improving physical characteristics of soil and providing environmental protection by controlling runoff and reducing soil erosion on slopes. *A. mollis* plant litter can modify the topsoil salinity, along with other soil properties such as infiltration. In other areas, this species may also be used for wildfire prevention purposes, with the high salt concentration found in its leaves increasing their moisture content, makes it behave as a fire retardant in the event of wildfire.

*Atriplex mollis* is a highly palatable, highly salt-tolerant plant species, with height of 60–120 cm. It predominantly
This species also establishes from cuttings, seedlings, or by direct seeding. The establishment of *A. mollis* from cuttings planted directly in the field is usually not reliable, but cuttings survive well in the nursery and, once established, may even be used for propagating desirable clones. Seedlings are the most reliable method of ensuring establishment. Seeds may need pretreatment such as soaking in water or removing the bracteoles in order to break dormancy.

Generally, the recommended method of grazing *A. mollis* is to leave the newly planted shrubs for 18–20 months before light grazing. Grazing of this species usually begins at the end of autumn, when the traditional annual pasture and stubble (crop residues) are at their lowest nutritional level. To protect carbohydrates stored in stems and favor satisfactory regrowth in the spring, fall browsing should not be intensive, as this depletes these reserves and reduces regrowth in the onset of the following growing season. The flowering stage is the best browsing time during the growth stage, as this ensures successful recovery.

### Effective Management

- Seeds should be treated to remove physiological dormancy, e.g. removing the bracteoles.
- Seeds should be cleaned, dried, and treated with fungicides.
- Grazing in the first year of growth is not recommended.
- Store seeds dry, cold, and not more than 8–10 months.

**ICARDA’s Rangeland Ecology and Forages unit (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.