

research program on Livestock



RESILIENT AGROSILVOPASTORAL SYSTEMS

CGIAR RESEARCH PROGRAM ON LIVESTOCK

Aims to increase the productivity of livestock agri-food systems in sustainable ways across the developing world.

Managing agrosilvopastoral systems: promoting droughttolerant, palatable annual legume species

Astragalus hamosus L.: is a legume species for revegetating arid degraded rangelands

Astragalus hamosus produces high quality forage and fixes nitrogen, which helps in maintaining productivity of rangelands. It is also one of the most important medicinal plants and is used as a diuretic, demulcent, emollient, laxative, antioxidant, antiinflammatory, and in treating ulcers.

Astragalus hamosus, known as Milkvetch, is an annual palatable plant with erect or ascending stems to 50 cm long. Stems sparsely covered with fine hairs, green in color, stipules triangular and persistent. Leaves well separated on the stem, rarely

Benefits:

- Hardy drought-tolerant plant
- High seed productivity
- Excellent sheep forage
- Adapted to heavy grazing
- Potentially useful for soil conservation

Photo credit: Dror Melamed

Scientific names: Astragalus hamosus L. Astragalus aegyptiacus Tragacantha hamosa Common names: dwarf yellow milkvetch, European milkvetch (القَتَاد الخطافي، العجفة) Locations: Mediterranean Basin & Europe

unifoliolate, pinnate, with 6–15 pairs of usually opposite leaflets and a terminal leaflet. Inflorescencea pedunculate dense raceme of a 5–10-flower. Flowers are white or pale yellow, born singly within the axils of persistent bracts. Calyx densely covered with hairs and sepal teeth finely pointed. Pods curve upwards in a semicircle, hairless, light brown when ripe containing 15 or more seeds. Seeds are irregular rectangular, ginger brown with a dull surface. This species has a symbiotic relationship with certain soil bacteria that occur in the form of nodules on their roots to fix nitrogen.

RESILIENT AGROSILVOPASTORAL SYSTEMS



Astragalus hamosus flowers Photo credit: Jacinta Lluch Valero



Astragalus hamosus green pods Photo credit: Stefen Mifsud



Astragalus hamosus pods and seeds Photo credit: Roger Culos

Astragalus hamosus is native to the Mediterranean region and can be found in areas with a Mediterranean-type climate. It is found in landscape and marabs (wadi beds) with wet micro-habitats in the desert. It is adapted to alkaline soils and its tolerance to alkalinity is increased with higher soil moisture levels.

Establishment and Management

Astragalus hamosus is a slow-growing plant and requires warm soil temperatures to germinate; therefore, it should be seeded in early spring. The seeds require scarification for rapid and germination. Inoculation uniform of seeds encourages nodulation, making the plants more productive. The seeds perform best when shallow seeded into a moist, packed seedbed. Flowering takes place from March, pods appear in April and mature in May, and seeds ripen in July-September. Without seed treatment, direct seeding followed either by light soil surface scarification or the presence of livestock flocks to trample the seeds a few centimeters into the soil is recommended. a

The light brown pods of milkvetch are harvested manually and contain a high proportion (85–95%) of hard seeds; an adaptive strategy for survival under unfavorable growing conditions.

Contact

Dr. Mounir Louhaichi, International Center for Agricultural Research in the Dry Areas (ICARDA). M.Louhaichi@cgiar.org Dr. Mahfouz Abu-Zanat, University of Jordan (UJ). abuzanatm@yahoo.com Dr. Mouldi Gamoun, International Center for Agricultural Research in the Dry Areas (ICARDA). M.Gamoun@cgiar.org

www.icarda.org

The hard seed coat makes the seed impermeable to water, which can be overcome by mechanical seed scarification.

Astragalus hamosus contains 22.2% crude protein, 20.6% acid detergent fiber, 48.3% neutral detergent fiber, 9.7% acid detergent lignin, 1.6% calcium, 0.4% phosphorus, 1.81% potassium, and 0.36% magnesium. It has high digestible dry matter, dry matter intake, and relative feed value (72.9%, 3.5%, and 199, respectively).

Effective Management

- Low salinity tolerance
- Hot water can break seed dormancy, but high temperatures (80°C) increase seed injury up to 97%
- Sulfuric acid treatment (70%) provides a high germination rate
- Mean germination time usually less than 7 days
- Suitable time for seeding is 3rd week of November
- Light soil scarification or trampling from grazing livestock is a good option for enhancing germination
- Prefers well-drained soils that are light (sandy) or medium (loamy)

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.