



## Dryland Systems Solutions

Producing More with Less

### Pastoral Systems

# Managing rangelands: promoting sustainable shrub species

## Periploca: A soil stabilizing shrub that can grow in poor soils

Arid and semi-arid rangelands face increasing climate variability and grazing pressure as the world's demand for food increases. ICARDA is introducing drought-tolerant 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.

*Periploca laevigata* is an important shrub for grazing in the dry season. Although it contains tannins, it is palatable and is grazed mainly by camels, sheep, and goats. As this plant is able to grow in dry and rocky conditions in the poorest of soils it has good potential for increasing forage in dry areas as well as reducing erosion. The plant is also known for its many healing properties.

*Periploca laevigata* is promoted in many development projects - linked to soil conservation and sustainable water and forage usage across North Africa and the Middle East. This plant is found in places with hot temperate winters and mainly colonizes rocky substrates - it can grow in many different types of soil and is known to be found in the driest and poorest of soils. What makes this plant unique is that it is often found on steep slopes with scraps of calcareous crust, a condition that cannot support many plant species. It can grow up to three meters (m) tall and its root system develops according to soil depth. The leaves are evergreen but occasionally become deciduous under water stress.

As a result, the plant not only improves forage availability, but also helps to stabilize soil. *Periploca*'s distribution ranges from sub humid to Saharan climates, as well as warm and temperate microclimates. It most commonly inhabits areas with an annual rainfall between 100-400 millimeters (mm). However, the plant can also adapt to extremely varied hydric conditions, and has been found in areas with an annual rainfall below 50 mm. *Periploca* is also known for its medicinal uses and is exploited as a traditional medicine for diabetes, rheumatism, hemorrhoids, and gastric ulcers. Due to its many favorable characteristics it has been promoted as forage for camels, goats, and sheep.



**Scientific name:** *Periploca laevigata* Ait

**Common names:** Hallab, Aiton

**Location:** Arid and Semi-Arid Climates in the Middle East and North Africa.

### Periploca benefits:

- Can grow in rocky soil with calcareous substrate
- Resilient, with well-developed root system
- Very drought tolerant
- Multiple medicinal uses
- Produces many seeds
- Stabilizes soil
- Dry matter intake for camel, goats, and sheep



A simple pod-like pericarp that contains 50-70 seeds and opens along the inner or ventral structure.



Periploca seeds are approximately 7mm long and 3mm wide. Seeds are reddish brown in color with ribs.



Periploca shrubs can grow up to three meters in height

## Establishment and management

Given that Periploca is often inaccessible to livestock – due to prostrate plant growth being positioned in the center of the shrub – the ‘cut and carry’ method of processing is needed to feed livestock. Although the leaves contain tannins, camels, goats, and sheep are still able to consume the leaves since they moderately consume the leaves throughout the day while mixing with other forages. For sheep and goat this plant represents 7.2 percent of total dry matter intake per year. The colors of the leaves are green to various colors of brown or gray purple at maturity. Mature seeds should be harvested from May to June, ideally by hand, and a grazing rest period should be implemented. The plant has a high reproductive capacity but seeds are not produced until the plant reaches two to three years of maturity. Flowers have been observed to be a seasonal occurrence in many areas - however this depends on the availability of rain and can vary in microclimates. Seeds have also occurred without flowers forming petals. Seeds are ellipsoid and elongated, and they have a yellowish brown color when they reach maturity. They also have tufts of hair at maturity and are carried by the wind.

To propagate seeds the substratum must be of calcareous rocks. Seeds should be sown in October in a nursery at 25 to 35 ° C with three to five seeds per bag. Seeds that are not ripe must be dried in mesh plastic nets or a canvass bag until the follicles open and the moisture content is less than 6 percent. These nets can be hung from the roofs of sheds for 15 to 20 days since mechanical ventilation for the seeds is not recommended. This method of drying prevents seed rot and seed dispersal after the opening of

follicles. Seed cleaning can be assured by threshing dry follicles, manually or mechanically, using a cleaner with a rectangular mesh sieve of 3.75 mm positioned underneath a round mesh sieve of 5.75mm, while controlling the rate of vibration. Manual screening can be performed using a sieve.

Seeds should be stored in an airtight container below 15° C. The weight of a thousand seeds is 11.940 grams. Before transplanting, it is recommended to stop irrigating for 10 to 14 days and to prune excess seedlings where there are more than two per bag. If planting in a nursery for seed production, a spacing of 4 m between plants is recommended.

## Effective maintenance:

- Mix with other livestock feed because of tannins
- Harvest seeds when leaf color changes
- Implement grazing rest period during seed harvest
- Seeds should be air dried
- Seeds sown in October at 25 to 35 ° C

## 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 miss-management, 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.nrnt.tn

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