Dryland Systems Solutions

Producing More with Less

Pastoral and Agro-Pastoral Systems

Managing rangelands: promoting sustainable native grass species

Scientific name: *Stipa lagascae*
Common names: Stipe géante (Tunisia and Libya), Alatham (Algeria), Zouai (Egypt), Gawther and El Atham Al ligassi (Syria)
Location: Mediterranean region in arid to humid climates.

Stipa lagascae: A heavy, adaptable grass that provides high quality hay

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.

Stipa lagascae is a perennial bunchgrass that is highly palatable for livestock. It is also harvested and dried as high quality hay for summer feed. This plant is found in humid to arid areas across the Mediterranean and is flexible to variations in temperature and water availability.

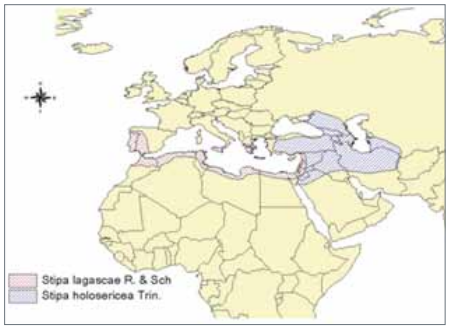
Limited to areas with deep soils that are relatively sandy with low salinity, *Stipa lagascae* is common in sandy coastal plains, in between isohyets with 150 and 250 mm. This grass-type is spread throughout the Mediterranean basin – across North Africa, West Asia, and Southwestern Europe – and is found in humid to arid climates.

Tolerant of salinity, *S. lagascae* can form an integral part of programs targeting the rehabilitation of degraded land with moderate salinity – a condition that affects a large part of the Mediterranean region's arid zone. Dorgham (1989) reported that low doses - up to six grams per liter (g/l) of salt (NaCl) stimulate germination of *Stipa lagascae*. However, it becomes an inhibitor with a dose of 9 g/l. It is grazed by sheep and goats at all phenological stages. Livestock prefer the fresh shoots of *S. lagascae*, particularly those that appear in the winter.

Stipa lagascae is a perennial bunchgrass occurring in tufts exceeding 60 centimeters (cm) with culms that are 30–60 cm long. Spikelets have one fertile floret without rachilla extension. The number of inflorescences or spikes produced by an individual of medium size varies from 0 to more than 29 in an ideal year. The weight of 1000 seeds is about 6.59 grams (g) (Neffati, 1994).

Stipa lagascae benefits:

- Can tolerate a wide range of temperatures and water availability
- Tolerates moderate salinity and can be used for rehabilitation
- Has high preference with livestock
- Provides high quality hay for summer feed.



Distribution of Stipa lagascae along the Mediterranean basin.

Seedling stage of Stipa lagascae

Mature stage of Stipa lagascae

Establishment and management

The vegetative phase starts with the occurrence of the first autumn rains. The cessation of growth varies over time depending on the availability of soil water reserves. Growth phase covers 8-9 months. The reproductive phase, however, usually occurs at the end of the winter season, and its success is dependent on water availability. The duration of this phase is relatively short and does not exceed the beginning of April. In terms of production, the species has an intensity of reproduction related to water regime. Visser and Reheul (2002) showed that the growth of the species did not respond to more than 50 kilograms (kg) of nitrogen per hectare (ha).

Stipa lagascae is a flexible plant that can tolerate a wide range of temperatures and water stress. The plant has a germination rate of 67 percent with water availability up to -0.7 MPa. The germination rate then decreases until -1.6 MPa (level of permanent wilting point), where it almost vanishes (Neffati et al., 1991; Ouled Belgacem, 2006). The temperature range of this species is quite wide, which allows for better adaptation to arid conditions. Dorgham (1989) showed that good germination of seeds was obtained in a temperature range of 10-20 °C. At 30 °C, the germination capacity is halved, and at 40 °C it vanishes completely. At low temperatures (between 2 and 5 °C), *S. lagascae* seeds germinate slowly (germination time exceeds 12 days). While the plant can germinate in the light it has the highest germination rate in the dark.

Effective maintenance:

- Growth starts with first autumn rains
- Reproduces seed at the end of the winter season with water availability
- Will not respond to more than 50 kg of nitrogen per hectare.
- Best germination rate at 10-20 °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 mis-management, the adverse effects 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, and livestock, and the improved management of water resources through close cooperation with farmers and national researchers

RESEARCH PROGRAM ON Dryland Systems

ICARDA Science for Better Livelihoods in Dry Areas

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