

## AGRO-SILVO-PASTORAL SYSTEMS

### CGIAR RESEARCH PROGRAM ON LIVESTOCK

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

## Managing rangelands: promoting highly palatable species with good nutritive value

*Plantago albicans* L. : a perennial herbaceous species that is highly palatable and widely distributed across the Mediterranean region

*Plantago albicans* L. is a rosette, perennial, hemicryptophyte herbaceous plant belonging to the Plantaginaceae family. *Plantago albicans* is widely distributed in the temperate regions throughout the Mediterranean region and southwestern Asia to Iran, along a wide altitudinal gradient of 0–1,300 m asl.

Known as Yanam, *Plantago albicans* grows on wastelands, slopes, and stony land, on dry and sun-exposed soils. In very heterogeneous environments,

### Benefits:

- Highly palatable species
- Has a very high-quality forage
- Colonizes open arid and semiarid environments
- Extensively used in traditional and modern medicinal applications
- Tolerant to osmotic and salt stresses



Photo © Avinoam Danin

**Scientific name:**  
*Plantago albicans* L.

**Common names:**  
Whitish plantain,  
fleaworts

**Locations:**  
Mediterranean basin &  
the Middle East  
region

it colonizes open, semiarid to arid areas and may equally well occur on deep, sandy soil or on surfaces of leveled silt with sharply dipping strata. *Plantago albicans* is recognizable by its silky, hairy aspect and lanceolate leaves with wavy margins. The stem is nonleafy, unbranched, and covered in silver-colored to whitish hairs. At the base, leaves are simple, entire, and linear to lanceolate with three silver colored to whitish veins. The flowers are brownish green or purplish, from 3 to 6 mm in diameter, joined together in cylindrical spikes from 1 to 8 cm long, carried by a floral pole with long white hairs, usually longer than the leaves. Generally, only one floral pole per tuft. Fruits are ovoid capsules with two loculi.

Flowers of *Plantago albicans**Plantago albicans* growing on loamy soil*Plantago albicans* growing on sandy soil

*Plantago albicans* is a highly effective species on abandoned croplands and has a very high erosion-reducing potential due to the high density of fine roots below the crown. In the habitats where it grows, *P. albicans* is the species with the highest selectivity ratio. It is very palatable to sheep; they eat whole rosettes, biting them off near the ground. Also, this species has various biological activities: antioxidant, hepatoprotective, anti-inflammatory, antiviral, immunomodulatory, antiadipogenic, antidiabetic, antirheumatic, anticancer, anti-obesity, and hypolipidemic.

### Establishment and Management

*Plantago albicans* grows naturally in arid areas and it sheds its leaves with summer season. In the low rain season, the growth activity of plant leaves is slow and leaf hairs increase with drought to decrease the amount of transpired water. The effective flowering process occurs from March to May. The flowers have wind-pollinated characteristics: they have stamens with long filaments arranged in a spike at the end of a long peduncle. Mature seeds, which are dispersed by wind and animals, contain mucilage that can imbibe a large amount of water when wetted and increase the area of contact of the seed with the soil and therefore ensure seed germination. Germination percentages are close to 100 with mucilage and from 9 to 57 percent for demucilaged seeds depending on the temperature, light and dark.

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The root systems of *P. albicans* spread vertically with a maximum depth of more than 1 m composed of a long main root with a small number of secondary branches.

### Nutritional composition

Nutrients and mineral content of *Plantago albicans* from arid rangeland of southern Tunisia

Nutrients	DM	Ash	CP	NDF	ADF	ADL
(%)	91.45	8.45	8.85	53.24	39.85	6.44
Minerals	Fe	Zn	Cu	Mn	Ca	Mg
(g/kg)	2.10	21.47	10.78	54.79	28.58	4.33

DM: dry matter; CP: crude protein; NDF: neutral detergent fiber; ADF: acid detergent fiber; ADL: acid detergent lignin

### Effective Management

- Very short period of seed germination
- Germination capacity was highest at 25°C in the dark
- Optimum percentage germination under saline solutions from 1 to 200 mmol L<sup>-1</sup>NaCl
- Presence of mucilage on seeds increases germination percentage and germination rate
- Seeds could withstand short drought periods without a marked decrease in germination capacity

### ICARDA's Rangeland Ecology and Forages (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.