



## 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 well-adapted shrub species

***Atriplex nummularia*: Highly drought and salt tolerant shrub, well-suited for rangeland rehabilitation and for providing quality fodder for livestock when herbage availability is low.**

*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.*

## Benefits:

- Drought resistant
- Can grow in areas with high salinity (max 300 mM)
- Is a good maintenance feed when other feed sources are depleted
- Is grown in arid areas all over the world
- Adequate source of crude protein



**Scientific name:**  
*Atriplex nummularia*  
Linldl.

**Common names:**  
Old man saltbush

**Location:**  
Arid areas across the world

*Atriplex nummularia* is a key feed resource in times when other feed is not available. This plant is grown in arid areas all over the world and is often promoted to improve forage availability. As a result, this plant is easily accessible in many areas. Improved rangelands with this plant provide an economic alternative especially during the dry season. This plant is a good choice for sites high in salinity. It will grow in saline environments up to 300 mM and growth will decrease in higher saline environments. It should be noted that water intake of livestock with high salt diets will increase 2-3 times. It is adequate in crude protein content but low in energy. Leaves have a higher nutritive value than twigs. The high amount of salt limits its potential. When tested in north eastern Jordan crude protein of leaves reached a maximum of 17.7% in the twigs and 21.3% in the leaves in February. Crude protein declined from June to December. This feed it intended to carry livestock over through the dry season. It is suggested to supplement with grain or good quality hay for optimal animal performance. It is known as one of the most productive plants for wool production.

Goats browsing *Atriplex nummularia**Atriplex nummularia* seedling*Atriplex nummularia* seeds

It is a large woody shrub that can grow over 3 m in height with sufficient water. Plant can grow in an erect or sprawling manner depending on planting density and grazing. Leaves are greyish green in color and are irregularly shaped with toothed edges. Seeds are reddish in color with a fan shaped fruit that can grow up to 6 mm in diameter.

*Atriplex nummularia* will grow in areas receiving less than 300 mm of annual rainfall, but will have greater productivity in areas with 340-400 mm of annual rainfall. It will grow on a range of soil types and occurs naturally in heavier textured soils. It is best to avoid sites with low salinity as there will be increased weed competition. The plant performs best in areas that have a low clay content in the surface layer with a sandy or sandy loam horizon with electrical conductivities between 5 and 15 dS/m. Dry matter yield of 1-2 t/ha have been recorded in areas with 350-400 mm rainfall.

## Establishment and Management

Establishing *Atriplex nummularia* from seed is difficult as the fruit has germination inhibiting chemicals. However, establishing from vegetative cuttings can create plants of one sex. If established from seed *Atriplex nummularia* can have male, female, or bisexual plants. It is recommended to place 50 viable seeds per placement to improve success. Median establishment rates were higher for planting seedlings (90%), than direct seeding with purpose built niche seeders (18%). Planting seedlings can have many different densities or layouts.

They are most commonly planted as dense stands or in alleys. It should be sown at the break of the season as early as possible.

Later planting can create the need for irrigation. Mounds and banks that can limit water logging can reduce losses. If good leaf growth has occurred plants can be grazed when they are one year old. However it is important to prevent damage to the woody portion of the plant. If this plant is not grazed or pruned it will grow too tall and the leafy forage can become out of reach of livestock. As a result, it is suggested that older plants be grazed periodically even with other more palatable forage is available or pruned to 30cm in height if they become too woody. While older plants are tolerant to grazing and can withstand grazing where only 5-10% of the leaf remains, *A. nummularia* should not be grazed continuously. It can be grazed aggressively for up to 6 weeks or until 5-10% of the leaf matter remains and then needs to be left to rest for six months.

### Effective Management

- Establish from cuttings or plant 50 seeds per hole.
- Grazing for short period at high stocking rates, and allowing for 6 months rest
- Grazing the plant every year and pruning it every other year to keep it with the reach of grazing

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## ICARDA's Rangeland Ecology and Management Unit

ICARDA's Rangeland Ecology and Management Unit aims to address the unsustainable use of resources induced by 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.