

Tree lucerne, providing agricultural products and ecosystem services

Introduction

Tree lucerne is one of the few leguminous fodder and fertilizer tree species that perform well in areas of high altitude. The plant fixes and adds nitrogen to the system, enhancing livestock, crop and soil productivity. Commonly referred to as tree lucerne and tagasaste, it is native to Spain and exotic species to Australia, Ethiopia, South Africa, Rwanda and New Zealand.

Photo 1: Tree lucerne in a well-managed farm in Africa RISING Lemo site, Southern Nations, Nationalities, and Peoples' region.



Photo 2: Tree lucerne and garlic intercropping at the Sinana Africa RISING site, Oromia region



Growing ecology

- Lucerne can grow in areas from 2,000–over 3,000 masl of the Ethiopian highlands.
- It requires from 350–1,600 mm of rainfall.
- The soil in which it is planted should be well drained.

Establishment of tree lucerne

- The identification of farmers interested in planting, managing and using tree lucerne is important.
- Seed sources: Seeds can be collected locally or sourced from suppliers.
- Seedling raising: Private, community and government nurseries are involved in this area of business.
- Seedling production systems include bare rooted and container systems.
- Seed treatment: Tree lucerne seeds require scarification or immersion in boiled water for one minute.
- Compatibility of farmers planting niches and tree Lucerne requirement is important.
- A seedling size of more than 45 cm is preferable for planting.
- Seedlings require at least three months in the nursery.
- A planting hole of 30–40 cm deep is recommended to protect the tap roots from being deformed.
- Tree Lucerne seedlings can be planted as live fence, fodder lot, soil and water conservation structures, and boundary planting and intercropped with crops and vegetables.
- Lucerne trees should be planted at least 25 cm apart from each other.

Management of tree Lucerne

- Regularly weed around the seedlings.
- Fencing should be erected to protect the trees against incursion by livestock—trampling and browsing.
- The use of mulch/manure is recommended to help retain moisture in the soil and suppress weeds.
- The plants should be watered at an early on to improve survival and growth rates.
- Cutting the tree at a height of 1–1.5 m provides good biomass.
- The plant can be harvested two–three times a year, depending on growing niches and management practices.

Utilization of tree lucerne

- In a well-managed farm, the plant can be harvested and used as animal feed with nine months of planting.
- The lucerne tree can produce more than 4–7 t ha⁻¹ of dry biomass year⁻¹ when planted at 1 m x 1 m spacing.
- The leaf and edible branches of tree lucerne contain large amounts of crude protein (20–25%) and digestible organic matter (> 70%).
- The foliage of tree lucerne can be fed green or wilted or preserved in the form of hay and used as needed.
- A 1 kg supplement of dried tree lucerne leaf feed to a lactating dairy cow can give up to 1.2 litres of extra milk.
- A 300–400 g supplement of tree lucerne hay fed to a fattening sheep is enough to achieve a daily body weight gain of 70 g.
- Tree lucerne seeds serve as good sources of poultry feed.
- Tree lucerne flowers are a very good source of bee fodder.

Important tip

Household size, access to reliable water supply, and management factors—including fencing planted seedlings to protect from browsing, mulching during dry periods, clean spot weeding and applying organic fertilizers—significantly enhanced survival and growth of tree lucerne at the Africa RISING planting sites.

Photo 3. Farmers at the Endamehoni Africa RISING site, Tigray region, feeding tree lucerne to small ruminants.



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Through action research and development partnerships, Africa RISING will create opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base.

The three projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads an associated project on monitoring, evaluation and impact assessment.

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