

PASTORAL AND AGRO-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 silvopastures: promoting native legume species

***Lathyrus sativus* L.:** a Neolithic dual purpose annual legume grown for its seeds for human consumption, and fodder for livestock feeding

Grass pea is a cool season legume species that can be grown in nontropical dry areas with 200–350 mm average annual rainfall. Although it is tolerant to drought stress, it can withstand flooding and survive under excessive rainfall.

Benefits:

- Tolerates drought
- Tolerates waterlogged conditions
- Contains a high level of protein
- Easy to cultivate as it requires low inputs
- Can be used as forage or fodder for animals
- Grains can also be utilized as human food during harsh times over a short period (less than three months)
- Tender young twigs can be consumed as vegetables
- High biological nitrogen fixation rate



Scientific name:
Lathyrus sativus L.

Common names:
Grass pea, chickling pea,
Indian vetch

Locations:
Southwest and central
Asia, the Middle East,
southern Europe, and
northern Africa

The origin of grass pea is unknown; however, it is thought to center on southwest and central Asia or the Balkan peninsula. It is a multipurpose crop for grain, feed, vegetables, and straw that improves soil fertility through atmospheric nitrogen fixation. Grass pea is a short, bushy annual herb, sub-erect, straggling or climbing, ranging in height from 0.6 to 9.0 m depending on cultivar. The leaves are 3–6 cm long, arranged alternately along the slender, quadrangular winged stem, consisting of two linear-lanceolate or narrowly elliptic leaflets. Panicles develop in the axils of leaves and end with bisexual single flowers, about 1.5 cm long, which may be blue, reddish purple, red, pink, or white.



Grasspea leaves and flowers



Grasspea plant at maturity stage



Grasspea pods and seeds

Days to flowering usually range from 76 to 123 days. The root system is robust and suitable for different soil types: heavy black clay, heavy clay, and poor soils, and can tolerate moderate salinity. Grass pea is a non-reseeding plant. Grass pea is predominantly self-pollinating plant with a chance up to 30% percent of outcrossing. Seeds ripen in 4–6 months.

Establishment and Management

Grass pea is grown as a pure stand crop or intercropped. It can be planted under rice-based cropping systems (seed broadcast two weeks before rice harvest); seeding rates vary from 45 to 120 kg/ha depending on environmental conditions, the purpose of cropping (food or feed), and seed size. At a depth of 4–6 cm, in a well-prepared field, seeds may be sown, broadcast or drilled in furrows. It is important to inoculate grass pea seeds with Group E rhizobial strain within 24 hours before planting. In poor quality soils, application of nitrogen and phosphorus is recommended to decrease the content of neurotoxin β -N-oxalyl-L- α , β -diaminopropionic acid (β -ODAP).

Grass pea has the potential for regrowth after being grazed or cut for vegetables at early stages. It can be considered as a pasture plant that has good grazing tolerance. The best nutritive and feeding values of grass pea as a green hay can be obtained at the flowering-early pod formation stage. The straw could either be used as protein supplement to, or as a replacement for cereal straw. Harvesting should be done as soon as the

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leaves begin to turn yellow and when pods turn gray and are not fully ripe to avoid shattering. Plants should be spread in the field until dry, then collected and threshed.

Nutritional composition

Grass pea is a highly nutritious crop; it is grown for food used for animal consumption. The crude protein in the hay ranged from 15.6 to 26.7 percent, 7.5 to 15 percent for the straw, and 20 to 40 percent for the seeds. The cultivation of grass pea is restricted because it contains β -ODAP which increases vulnerability to paralysis of the lower limbs in humans and animals following consumption for three to four months. This compound is found in all tissues at all development stages in grass pea, varying from 0.1 to 2.5 percent depending on genetic factors and environmental conditions. The safe content of β -ODAP for human consumption is lower than 0.2 percent, which can be reached through breeding programs.

Effective Management

- It can be grown as a pure stand crop or intercropped
- Inoculate seeds with E rhizobial strain group before planting
- Nitrogen and phosphorus may decrease β -ODAP content.
- Early harvest is recommended to avoid seed shattering and loss.

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.