Lablab (*Lablab purpureus*) for livestock feed

Uses/applications

Lablab is a high yielding forage legume which can be grazed, harvested for hay or silage, or used as a green manure and break crop in sub-tropical and tropical farming systems (Chakoma et al., 2016). It is commonly used as a supplementary feed (Khalili et al. 1994; Nsahlai et al. 1996; Tulu et al. 2018), for intercropping with cereal crops (Mpairwe et al. 2002) and is considered to have significant potential for the sustainable intensification of smallholder crop/livestock production systems (Ewanisha et al. 2007; Nord et al. 2020). It has been shown to be tolerant of acid soil conditions (Mugwira and Haque 1993) and to address soil fertility decline (Cook et al. 2020; Adebisi and Bosch 2004). Lablab is also used for the control of insect pests (Qureshi et al. 2016) and in ethnoveterinary medicine. Examples from Kenya show that it can be used to treat eye problems in sheep and lung problems in cattle, sheep and goats (Adebisi and Bosch 2004).

Annual lablab forage yields range 6–9 tonnes of dry matter (DM) per hectare. Forage has an average crude protein content of about 16% DM, which can vary from 8–33% in sub-Saharan Africa, depending on local conditions and stage of harvest (https://feedsdatabase.ilri.org/). The crude protein levels in the leaves ranges from 21–38%, in the stem 7–20%, and in the grain 20–28%. Digestibility of leaves ranges from 55–76% (Mudunuru et al. 2008; Linga et al. 2003).

Bishoftu field generation site, 2019

Description

- Lablab is a summer growing annual, or occasionally short-lived perennial, forage legume.
- It is a twining, climbing, trailing or upright herbaceous plant that can grow to lengths of 3–6 metres.
- As a forage legume, lablab can restore soil fertility and is considered tolerant of drought and cool temperatures.

Environment

- Requires lower elevation and warm temperatures for best growth
- Best suited to regions with 600–2500 mm annual rainfall and predominantly summer distribution
- Grows in a wide range of soils from deep sands to heavy clays provided drainage is good. Will grow on acidic to alkaline soils (pH water 5.0–7.5).

Limitations

- Short-lived
- Poor frost tolerance
- Low salt tolerance
- Does not tolerate poor drainage or prolonged water logging
- Causes bloat if fed in large quantities as green fodder

Management

Field preparation: well prepared and ploughed field.

Establishment: broadcast seed at 30 kg/ha at 3 cm depth and cover.

Inoculant: Some sub-tropical soils may have suitable native rhizobia. However, inoculation with lablab rhizobia is recommended.

Fertilizer: commonly grown without fertilizer applications but, when grown in sandy soil, it may benefit from applications of Phosphorus and Sulphur.

Weeding: weeding after the third week of establishment is recommended to minimize competition with weeds at early seedling growth.

Major pests and diseases: lablab roots can be attacked by nematodes and the seeds by pod feeding and boring insects. Disease problems are rare; it is less susceptible to root diseases than cowpea.

Harvesting: at flowering, after three months of sowing/planting.

Seed production

Flowering and pod and seed production often continues over an extended period, especially with good water availability. 'Rongai' is late flowering and seed production is often affected by frosts. 'Highworth' is earlier flowering and so avoids most frosts. Grain yields of 1–2.5 t/ha can be achieved, depending on cultivar, environment and management.

Released varieties and promising accessions

Country	Variety name		DOI	Release Year	Institute
Australia	Rongai Noir	11609	10.18730/FQGC1	1962	CSIRO
Australia	Highworth	147	10.18730/FT38T	1973	CSIRO
Kenya	Dash	14437	10.18730/FSW0G		KALRO
Ethiopia	Gebisa-17	14417	10.18730/FSVC~	2016	OARI
Ethiopia	Beresa-55	14455	10.18730/FSWJ$	2016	OARI
	Promising accession	6529	10.18730/G5V0S		
	Promising accession	6930	10.18730/G63A		

References

Adebisi, A.A. and Bosch, C.H. 2004. Lablab purpureus (L.) Sweet. In: Grubben, G.J.H. and Denton, O.A. (eds), *Plant Resources of Tropical Africa (PROTA)*, no. 2, vegetables. Wageningen, The Netherlands: PROTA Foundation/Backhuys Publishers/CTA: 343–34.

Chakoma, I., Manyawu, G., Gwiriri, L., Moyo, S. and Dube, S. 2016. *The agronomy and use of Lablab purpureus in smallholder farming systems of southern Africa*. ILRI extension brief. Nairobi, Kenya: ILRI. https://hdl.handle.net/10568/78513.

Cook, B.G., Pengelly, B.C., Schultze-Kraft, R., Taylor, M., Burkart, S. et al. 2020. *Tropical forages: an interactive selection tool.* 2nd and revised Edn. International Center for Tropical Agriculture (CIAT), Cali, Colombia and International Livestock Research Institute (ILRI), Nairobi, Kenya. www.tropicalforages.info.

Ewansiha, S., Chiezey, U., Tarawali, S. and Iwuafor, E. 2007. Potential of Lablab purpureus accessions for crop-livestock production in the West African savanna. *The Journal of Agricultural Science* 145(3): 229–238. doi:10.1017/S0021859606006599

Khalili, H., Osuji, P.O., Umunna, N.N. and Crosse, S. 1994. The effects of forage type (maize-lablab or oat-vetch) and level of supplementation (wheat-middlings) on food intake, diet apparent digestibility, purine excretion and milk production of crossbred (Bos taurus × Bos indicus) cows. *Animal Science* 58: 321–328. https://doi.org/10.1017/S0003356100007248.

Linga S.S, Lukefahr S.D. and Lukefahr, M.J. 2003. Feeding of Lablab purpureus forage with molasses blocks or sugar cane stalks to rabbit fryers in subtropical south Texas. *Livestock Production Science* 80: 201–209. https://doi.org/10.1016/S0301-6226(02)00189-6.

Mpairwe, D.R., Sabiiti, E.N., Umunna, N.N., Tegegne, A. and Osuji, P.O. 2002. Effect of intercropping cereal crops with forage legumes and source of nutrients on cereal grain yield and fodder dry matter yields. *African Crop Science Journal* 10: 81–97. https://hdl.handle.net/10568/28052.

Mudunuru, U., Lukefahr, S.D., Nelson, S.D. and Flores, D.O. 2008. *Performance of group rabbits fed Lablab purpureus forage with molasses mini-blocks and restricted commercial pellets*. Nutrition and Digestive Physiology, 9th World Rabbit Congress. 10–13 June, Verona, Italy.

Mugwira, L.M. and Haque I. 1993. Screening forage and browse legumes germplasm to nutrient stress: II. Tolerance of Lablab purpureus L. to acidity and low phosphorus in two acid soils. *Journal of Plant Nutrition* 16: 37–50.

Nsahlai, I.V. and Umunna, N.N. 1996. Sesbania and lablab supplementation of oat hay basal diet fed to sheep with or without maize grain. *Animal Feed Science and Technology* 61: 275–289. https://doi.org/10.1016/0377-8401(95)00941-8.

Nord, A., Miller, N.R., Mariki, W., Drinkwater, L. and Snapp, S. 2020. Investigating the diverse potential of a multipurpose legume, Lablab purpureus (L.) Sweet, for smallholder production in East Africa. *PLoS ONE* 15: e0227739. https://doi.org/10.1371/journal.pone.0227739.

Qureshi, S., Angove, M., Wilkens, S. and Midmore, D. 2016. Use of lablab (Lablab purpureus (L.) Sweet) for bio-control by native arthropods and its effect on yield of pumpkins. *Bulletin of Entomological Research* 106(2): 191–196. doi:10.1017/S0007485315001005.

Tulu, A., Khushi, Y.R. and Challi, D.G. 2018. Supplementary value of two Lablab purpureus cultivars and concentrate mixture to natural grass hay basal diet based on feed intake, digestibility, growth performance and net return of Horro sheep. *International Journal of Livestock Production* 9: 140–150. https://doi.org/10.5897/IJLP2017.0444

Contact

Asebe Abdena
a.abdena@cgiar.org
Feed and Forage Development

Cover photo
IITA/Jonathan Odhong

ILRI thanks all donors that globally support its work through their contributions to the CGIAR Trust Fund.

Patron: Professor Peter C Doherty AC, FAA, FRS
Animal scientist, Nobel Prize Laureate for Physiology or Medicine–1996

Box 30709, Nairobi 00100 Kenya
Phone +254 20 422 3000
Fax +254 20 422 3001
Email ilri-kenya@cgiar.org

ilri.org
better lives through livestock

ILRI is a CGIAR research centre

Box 5689, Addis Ababa, Ethiopia
Phone +251 11 617 2000
Fax +251 11 667 6923
Email ilri-ethiopia@cgiar.org

ILRI has offices in East Africa • South Asia • Southeast and East Asia • Southern Africa • West Africa

November 2020