USDA NRCS
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Plant Guide

LABLAB

Lablab purpureus (L.) Sweet

Plant Symbol = LAPU6

Contributed by: USDA NRCS Cape May Plant Materials Center, Cape May, NJ

Lablab (Lablab purpureus). (Photo by Christopher Sheahan, USDA-NRCS, Cape May Plant Materials Center)

Alternate Names

Alternate Common Names: hyacinth bean, hyacinthbean, bonavist bean, field bean, Egyptian bean

Alternate Scientific Names:
Dolichos benghalensis Jacq.,
Dolichos lablab L.,
Dolichos purpureus L.,
Lablab niger Medikus,
Lablab purpurea (L.) Sweet,
Lablab vulgaris (L.) Savi,
Vigna aristata Piper

Uses

Commercial crop: Lablab purpureus is grown as a pulse crop (crop harvested for dry seed) in Africa, Asia, and the Caribbean. It is also consumed as a green vegetable (green bean, pod, leaf). Maass et al. (2010) observe that *L. purpureus* may suffer from low yields when grown as a main cash crop, and suggest that it is more popular in homegardens and mixed-cropping schemes. Protein isolate from the bean can be used as a food additive for improving cake quality (Maass et al., 2010).

Forage: L. purpureus is used as forage, hay, and silage. As forage, it is often sown with sorghum or millet. The leaf is very palatable but the stem is not. The seeds are moderately palatable. Overall, it is one of the most palatable legumes for animals (Valenzuela and Smith, 2002).

The leaf has crude protein of 21 to 38% and the seed contains 20 to 28% crude protein (Cook et al., 2005). The seeds contain large amounts of various vitamins and minerals, but contain tannins and trypsin inhibitors so must be soaked or cooked before human consumption.

The leaves make excellent hay for cattle and goats, but the stem is difficult to dry, and must be mechanically conditioned through crushing (FAO, 2012). Silage made from a mix of *L. purpureus* and *Sorghum* sp. raised the protein content of sorghum by roughly 11% with a 2:1 mixture of lablab: sorghum (FAO, 2012).

Cover crop/green manure: L. purpureus is used as a nitrogen-fixing green manure to improve soil quality. It often produces more dry matter than cowpea (*Vigna unguiculata*), especially during drought, and can produce roughly 1,750 lb of leaf matter (Cook et al., 2005) or 2.5 tons of total biomass per acre (Valenzuela and Smith, 2002). Each ton of biomass produced 50 lb of nitrogen (Valenzuela and Smith, 2002). It not only produces nitrogen through fixation, but returns nitrogen through leaf decay (FAO, 2012). Initially growth is slow, but once established, it competes well with weeds. It has an extensive root system that improves the physical condition and function of the soil.

Wildlife: L. purpureus is a good choice for food plots and will attract deer. Plots may require electric fencing to keep out deer during early seedling development.

Ornamental: Currently the most common use of *L. purpureus* in the United States is as an ornamental crop in the cut flower industry (Stevens, 2012). It is valued for its late summer flowers and colorful, purple peapods. Depending on the weather in late summer, harvest yields can be up to 55 cut stems per plant (Anderson et al., 1996).

Ethnobotany

L. purpureus has been used in the Philippines and China as a stimulant, to reduce fever, to reduce flatulence, to stimulate digestion, and as an antispasmodic (Stuart, 2011). In Namibia, the root has been used to treat heart conditions (Pennacchio et al., 2010).

Status

L. purpureus is an introduced species in the United States. Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current

status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

Description
General: *L. purpureus* is an herbaceous, climbing, warm-season annual or short-lived perennial with a vigorous taproot. It has a thick, herbaceous stem that can grow up to 3 feet, and the climbing vines stretching up to 25 ft from the plant (Valenzuela and Smith, 2002).
It has trifoliate, long-stemmed leaves. Each egg-shaped leaflet widens in the middle and is 3–6 in. (7.5–15 cm) long. The surface of the leaflet is smooth above and short-haired below.

The flowers grow in clusters on an unbranched inflorescence in the angle between the leaf and the main stem. It may have white, blue, or purple flowers depending on its variety. Seedpods are 2 in. (4–5 cm) (Cook et al., 2005) to 4 in. (10 cm) long (Venezuela and Smith, 2002), smooth, flat, pointed, and contain 2 to 4 seeds. Seeds can be white, cream, pale brown, dark brown, red, black, or mottled depending on variety.

Distribution: *L. purpureus* is an old world food crop that is thought to have originated in Africa (Cook et al., 2005) or India (Murphy and Colucci, 1999). It has been successfully grown in the Southern United States, Texas, Florida, Georgia, Puerto Rico, and as far north as the Great Lakes and Canada. It grows from sea level up to 6,500 ft. (FAO, 2012). For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

Habitat: It grows best in the tropics and subtropics.

Adaptation
L. purpureus can grow in a variety of soils, from sand to clay, in a pH range of 4.5–7.5 (Cook et al., 2005). It does not grow well in saline or poorly-drained soils, but it grows better than most legumes under acidic conditions (Valenzuela and Smith, 2002). It can continue to grow in drought or shady conditions, and will grow in areas with an average annual rainfall is 25–120 in. (Cook et al., 2005). It is more drought resistant than other similar legumes like common beans (*Phaseolus vulgaris*) and cowpea Maass et al., 2010), and can access soil water 6 feet deep (Cook et al., 2005).

It grows best where average daily temperatures are between 64 to 86°F; but it can grow at 37°F for short periods (Cook et al., 2005) and can tolerate light frosts. It is better adapted to cold than other warm-season forages such as velvet bean (*Mucuna pruriens)* or cowpea.

Establishment
The seed should be inoculated with a cowpea-type, *Bradyrhizobium* strain as it does not easily nodulate with native rhizobia (FAO, 2012). If grown in the same area, inoculant is not needed in subsequent years, since rhizobia bacteria will be in the soil. The seeds do not need to be scarified, but studies have shown that the seedbed should be adequately prepped either through chemical preparation or cultivation (Murtagh, 1972). Natural pastures must be cultivated for successful establishment (FAO, 2012).

The seed should be sown 1 to 4 in. deep at 11–18 lb/acre on rows 2.5 ft wide with roughly 1 to 1.5 ft between plants (Cook et al., 2005). When planting with grasses, reduce the seeding rate by half. Planting dates should coincide with other warm-season legumes. No additional fertilizer is necessary (FAO, 2012).

Management
L. purpureus can be used in rotations with cereals to add nitrogen to the soil. It is often used as an intercrop species with maize, but should be sown roughly 30 days later than maize so as to limit competition. It can also be sown as a monoculture.

In green manure applications, the crop should be terminated before flowering to return maximum amounts of N to the soil. The plant can be mowed almost to ground level and will regrow, but regrowth will be slowed by the cutting (Valenzuela and Smith, 2002). Fire will kill the plant.

L. purpureus should not be heavily grazed. Grazing can begin 10 weeks from the date of planting and animals can be grazed 2 to 3 times per season if the plant is not eaten below 10 in. (25 cm) (FAO, 2012). Cutting the plant lower will result in delayed regrowth. To avoid bloat, supplement the animal's diet with grasses.

Pests and Potential Problems
Generally, *L. purpureus* is less susceptible to root diseases than cowpea (Cook et al., 2005), but can be affected by root-knot nematode infection (Valenzuela and Smith, 2002). Pod borers can affect seedpods. Cutworms and wireworms may damage the plant during establishment, and *Heliothis* sp., mirids, and thrips may damage the crop during flowering and pod development (Mullen et al., 2003). It may develop diseases such as bacterial wilt (*Xanthomonas* sp.) and powdery mildew (Cook et al., 2005).

Environmental Concerns
L. purpureus is a weak perennial and is not likely to spread (FAO, 2012). In some cases, the climbing variety of *L. purpureus* has shown some invasive tendencies in old fields (Valenzuela and Smith, 2002).

Seeds and Plant Production
L. purpureus is a short-day annual, flowering in response to longer nights in late-summer and fall. It is mainly self-fertilizing, and will set seed within the first year after planting. Flowering and seedpod production is sporadic. Cook et al. (2005) observed that plants will produce

roughly 900–2,000 lb of seed/acre, but FAO (2012) observed cases in South America where significantly less seed (450–900 lb/acre) was produced. There are roughly 1,500–1,950 seeds per pound (FAO, 2012). It will produce seed in the Southern United States, including Texas, Georgia, and Florida.

Cultivars, Improved, and Selected Materials (and area of origin)

L. purpureus is well known and valued for its physiological diversity, and can exhibit both bush and twining growth habits, as well as early-flowering and late-flowering characteristics. More than 3,000 accessions of germplasm have been collected worldwide (Maass et al., 2010). Yet despite its morphological diversity, the two varieties Rongai and Highworth (both forage varieties) seem to be most popular in the United States. Rongai (late-flowering) grows upright and has white flowers that bloom when there is less than 11 hours of daylight (FAO, 2012). Highworth (early-flowering) is a twining variety that has purple blooms. There is also an earlier flowering variety from East Texas called Rio Verde that flowers after 55 days.

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