JACK BEAN

Horse Bean, Overlook Bean, Gotani Bean

Canavalia ensiformis Fabaceae - Pea family

ECHO PLANT INFORMATION SHEET

ORIGIN – Jack Bean is native to the West Indies and Central America. Jack Bean closely resembles Sword Bean, *Canavalia gladiata*, an Old World cultivated bean species, and the predominantly African wild species, *Canavalia virosa.* Some authors consider both Jack Bean and Sword Bean to be derivatives of the African wild species because of the close resemblance among all three species. Jack Bean now is widely distributed in the tropics and subtropics although it is classified as a minor vegetable rather than a major crop species.

USES – Jack Bean is a valuable green manure and cover crop species. Jack beans frequently will grow on impoverished tropical soils where other pulses will not grow. It has been a useful species in tropical soil reclamation efforts because of its deeply penetrating root system (affording high drought tolerance), its nitrogen fixation capabilities (providing for soil nutrient improvement) and its tolerance of a wide range of soil acidity and salinity conditions. Jack Bean has successfully been used as a cover crop species interplanted with cacao, citrus, coconut, pineapple and tobacco. Jack Bean can be used as a forage crop for ruminant (cud-chewing) animals, especially if the plant material is dried before it is fed to animals. Dried forage material is more palatable to livestock than fresh material. Jack bean forage should be introduced gradually into the animal diet and should be supplemented with other forage materials because of toxins contained in the plant material. Non-ruminant animals sustained on a diet of jack bean seeds gain less weight than ruminant animals. The growth-inhibiting properties of jack bean forage materials are attributed to the presence of the toxic amino acid, canavanine, which interferes with the body's use of arginine, and the presence of the proteins concanavalin A and B that interfere with nutrient absorption in the animal and human digestive systems. Heat treatment eliminates the toxic effects of these growth-inhibiting substances.

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CULTIVATION – Jack Bean is grown from seed. If grown as a green manure, the seeds usually are broadcast. If grown as a bush variety pulse or food crop, the seeds may be planted 30-45cm (12-18in) apart, in rows 60-90cm (24-36in) apart. Twining varieties require supports for best yields. Jack Bean thrives in warm humid environments with a long growing season like that found in the lowland tropics. Jack Bean has been grown, however, at elevations up to 1,800m (6,000ft). The plants thrive in full sunlight but tolerate somewhat shady environments. Jack beans tolerate acid soil conditions ranging from pH5 to pH6. They also tolerate waterlogged soils or high salinity soils better than most other pulse species.

HARVESTING AND SEED PRODUCTION – Green immature pods may be harvested 90-120 days after planting. Mature seeds may be harvested 180-300 days after planting. The seeds should be harvested by hand to prevent shelling.

PESTS AND DISEASES – Jack Bean is relatively free of pests and diseases. The thick seed coats resist seed pests well during storage. Root rot by the fungus *Colletotrichum lindemuthianum* has been a problem in some regions. Stem-borers and leaf-eating beetles pose problems in early stages of growth. Moth caterpillars (*Laphygma* sp.) and pod weevils (*Sternechus* sp.) are reported as major pests on Jack Bean in Brazil.

COOKING AND NUTRITION – The young leaves and tender branches may be cooked and eaten by humans as a potherb. Immature pods and the soft, moist green seeds may be eaten as cooked vegetables. The mature seeds are not flavorful and the mealy texture of the cooked seed is not pleasant to the palate in most cultures. Mature seeds require long periods (often several hours) of soaking and boiling in water or brines to soften the seed and to rid them of the growth-inhibiting toxins mentioned above. The tough seed coats, that comprise 13% of seed weight, need to be removed, after cooking, before eating the seed. Dried jack bean seeds are a nutritious food source providing the seeds are properly cooked to rid them of toxic effects. Protein is 24-28% and carbohydrates 45-57% of dry seed weight. Jack bean seeds sometimes are roasted and used as a coffee substitute. In Indonesia, steamed flowers and leaves are used as flavorings.

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