

ECHO Asia Seed Fact Sheet

Scientific name – *Cajanus cajan*

English common name – Pigeon pea, congo pea, red gram

Asian common names –

- Chinese: 木豆 mu dou
- Hindu: toor टूर
- Japanese: ピジョンピー – pijonpii
- Khmer: sândaèk dai
- Lao: thwàx h'ê.
- Malay: kacang dal
- Indonesian: kacang kayu
रहर
- Nepalese: rahar
- Tagalog: tabios
- Thai: ທູ້ມະແຮ່ thua mahae
- Vietnamese: Đậu chieu



Photo: ECHO Asia staff

Variety – **Thailand Mix** (determinate): A local Thai variety with good flavor.

General description and special characteristics – Pigeon pea is a perennial, tree-like shrub that grows to 1.2 – 3.1 m (4-10 ft.) tall and is used for food and fodder as well as in agroforestry systems. It produces dark green leaves and green, edible pods with seeds that are high in protein. Originating in India, this species is grown throughout the tropics. Pigeon pea plants fix nitrogen quickly (168-280 kg N/ha or 150-249 lbs N/acre) and produce a deep root system. Although a short-lived perennial (up to 5 years), the crop can be planted as an annual.

Crop uses (culinary) – Pigeon pea can be eaten as dried peas, a flour, or as green vegetable peas. It is high in protein (~21%) and the important amino acids methionine, lysine and tryptophan. Dried peas can be sprouted to enhance digestibility and then cooked for a flavor different from green or dried peas. In general, dried peas take at least 2 hours to cook and are recommended to be soaked overnight. In Indonesia, they may be used instead of soybean to make tempeh or tofu. In India, split pigeon peas (*toor dhal*) are boiled into a porridge and eaten with curry.

Young green pods are also harvested before seeds are distinct and boiled to eat, cooked in curries or used to make relishes. In Palaung villages in northern Thailand, the young pods are boiled and eaten with a spicy chilli paste.

Crop uses (soil improvement) – Pigeon pea is useful in hedges, windbreaks, on dry soils, and in agroforestry (i.e. in alley cropping systems in which trees hold soil in place and are pruned lightly to supply green manure) applications. In northern India, long-duration pigeon pea has been proven to fix up to 200 kg N/ha (178 lbs. N/acre) over a 40-week period. Pigeon pea is widely planted as a green manure and improves soil through its extensive root system, nitrogen fixation, and the mulch provided by fallen leaves. In Southeast Asia, pigeon pea is sometimes intercropped with maize and upland rice.

Crops uses (livestock production) – The tops of the pigeon pea plants with fruits are excellent fodder and are also made into hay and silage. Pigeon pea can be planted alone or in pastures as browse plants. In India, the by-products of dhal production (seed coat and broken cotyledons) are used as cattle and poultry feed. Seeds, if cooked (e.g., boiled, steamed or roasted), can be fed to pigs. In Hawaii, equal quantities of cracked pigeon pea and cracked maize have been used as poultry feed. The leaves can provide a good substitute for alfalfa in animal feed formulations, particularly in areas not suitable for alfalfa. Pods can be used as feed but are limited by low protein and high fiber content.

Other uses – The woody stems of pigeon peas can also be used as firewood, fencing, and thatch.

Seasons of production – Seeds are sown at the beginning of the rainy season both for annual or multi-year purposes.

Length of production and harvest period – Most types flower when the days are 11 to 11 ½ hours long, but varieties responding to both shorter and longer day lengths are available, and some will flower at any time of the year. Usually, flowering begins in 120-150 days and seeds mature in 250 days, but these figures can be as early as 60 and 100 days respectively. Some indeterminate varieties will produce flowers and seeds continually.

Production methods – Pigeon pea is usually propagated by seed. Planting arrangements vary widely, and depend on the planting purpose. Grown as a pulse crop in India, 2-4 seeds can be sown in holes established in a 1m x 1m (3 ft. x 3 ft.) planting distance. It is usually grown as an annual, because yields drop off after the first year. In India and Burma, the whole plant is harvested, dried, and threshed.

Pigeon pea is often intercropped with cereals, but also with cassava and cotton. With planting distances of 2 meters (6 ft.), its slow initial growth reduces competition for the main crop and its late maturity spreads labor requirements at harvest time. After harvest of the main crop, long-duration pigeon pea continues to grow and to produce seed and to protect the soil. In Uganda and Mauritius, it is generally planted as a restorative crop towards the end of a rotation cycle.

Planted as a green manure or as fodder crop, pigeon pea can be grown for 3 to 4 years. It can also be grown in hedges and ratooned. However, it is best to cut back to heights no less than 50 cm (20 in.); plants will die if cut back to or near ground level.

Pollination – Generally pigeon pea is considered a self-pollinating species; however, varying degrees of cross-pollination have been observed. *Seed to Seed* states that although the flowers are small and difficult for insects to enter, small bees are attracted to the flowers and can effectively cross-pollinate different varieties grown within ½ mile (805 m) of each other (Ashworth 1991). Blossom bagging or caging will ensure seed purity of different varieties grown in close proximity.

Environmental conditions for production – Pigeon pea is grown in the tropics and subtropics between 30°N and 30°S latitudes. Optimum average temperatures range from 18–29°C; frost is not tolerated. It does best where annual rainfall ranges from 500-1,500 mm (20-60 in.) a year. The range of suitable elevations depends on latitude. In Venezuela, pigeon pea is grown up to 3,000 m (9,843 ft.) and in Jamaica up to 1,100 meters (3,610 ft.). In Hawaii, trees failed to set seed at 1,000 meters (3,281 ft.).

Soil requirements – Generally considered drought-resistant, pigeon pea can be grown on a wide range of soil types. Waterlogging is harmful. Drained soils of intermediate water-holding capacity and with a pH between 5.0–7.0 are favorable.

Pests and diseases – *Fusarium udum* causes wilt and is the most serious pigeon pea disease in India. It is soil-borne and attacks all parts of the plant, causing blackening in root and stem tissues. The most serious pests in India are *Heliothis armigera* and *Exelastis atomosa* caterpillars (which are borers) and *Agromyza obtuse* flies. *Heliothis virescens* is a major pest that feeds on developing seeds. Infestation by pod borers takes place at time of flowering but can be controlled by shaking the pod borer larvae off of the plants.

Seed saving – Pigeon pea pods are easily collected and not difficult to shell.

References –

Ashworth, Suzanne. 1991. *Seed to Seed*. Seed Savers Exchange, Inc. Decorah, Iowa.

Bunch, R. CIDICCO Resource Book. Changing our Understanding of the Fertility of Tropical Soils.

Purseglove, J.W. 1968. *Tropical Crops: Dicotyledons*. Longman Group Ltd, Essex, U.K.