

ECHO Asia Seed Fact Sheet

Scientific name – *Cicer arietinum*

English common name – Chickpea

Asian common names – (from Multilingual Multiscript Plant Name Database <http://www.plantnames.unimelb.edu.au/Sorting/Cicer.html#arietinum>) -

- Burmese: ကုလားပဲ kalabèh
- Chinese: 鹰嘴豆 ying zui dou, 鸡豆 ji dou, 鸡头豆 ji tou dou, 回回豆 hui hui dou (medicinal name)
- Hindi: चना chan, चन्ना दाल channaa daal, चना chanaa (chana - rajasthan), चुन्ना chunnaa
- Malay (Malaysia): kacang Arab, kacang kuda
- Nepalese: चना canaa (Cana)
- Thai: ถั่วหัวช้าง thua hua chaang, ถั่วลูกไก่ thua luk gai



Varieties –

- **Burma red:** Produces small, rough-coated, red-brown seed (Desi type); approximately 3.5 months to first seed harvest.
- **Burma round:** Produces large, round, smooth, light-brown seed (Kabuli type); approximately 4.5 months to first harvest.

General description and special characteristics – One of the oldest cultivated legumes on record, chickpea is a key ingredient in such well-known Asian and Middle-Eastern foods as humus, falafel, and Burmese (Shan) tofu. Chickpea is grown in tropical, sub-tropical and temperate regions. Two types of chickpea are recognized: desi (colored, small seeded, angular, and fibrous) and kabuli (beige, large-seeded, and ramsh-head shaped, with lower fiber content). The kabuli is grown in temperate regions, while the desi is grown in the semi-arid tropics (Muehlbauer and Singh, 1987; Malhotra et al., 1987).

Crop uses (culinary) – Chickpea is valued for its nutritive seeds with high protein content (25.3-28.9 %) after dehulling (Hulse, 1991). Chickpea seeds are eaten fresh, sprouted, parched, fried, roasted, and boiled; as a snack food, sweet, and condiment; ground into a flour for soup, dhal, tofu, and bread; or as a side dish prepared with pepper, salt and lemon (Saxena, 1990). Dhal is the split chickpea without its seedcoat, dried and cooked into a thick soup or ground into flour for snacks and sweetmeats (Saxena, 1990; Hulse, 1991). Young plants and green pods are eaten like spinach.

Crop uses (livestock production) – Animal feed is another use of chickpea in many developing countries. Gram husks, green or dried stems, leaves, and whole seed (once milled) are used for stock feed.

Crop uses (textile) – Leaves are said to yield an indigo-like dye. Chickpeas yield 21% starch, making it suitable for textile sizing, giving a light finish to silk, wool, and cotton cloth (Duke, 1981). An adhesive may also be prepared from chickpea; although not water-resistant, it is suitable for plywood.

Crop uses (medicinal) – Among the food legumes, chickpea is the most hypocholesteremic agent; germinated chickpea was reported to be effective in controlling cholesterol level in rats (Geervani, 1991). Acid exudates from chickpea leaves are also used as vinegar or applied medicinally. "Glandular secretion

of the leaves, stems, and pods consists of malic and oxalic acids, giving a sour taste. In India, these acids used to be harvested by spreading thin muslin over the crop during the night. In the morning the soaked cloth is wrung out, and the acids are collected in bottles. Medicinal applications include use for aphrodisiac, bronchitis, catarrh, cutamenia, cholera, constipation, diarrhea, dyspepsia, flatulence, snakebite, sunstroke, and warts. Acids are supposed to lower the blood cholesterol levels." (Duke, 1981). Cooked chickpea-milk (4:1) mixture is another use of the legume, which in Chile is reported to be good for feeding infants, and effective in controlling diarrhea.

Seasons of production – Seed is sown when ground has warmed or when rains recede, depending on the region (March to mid-April in Turkey and the United States, February-March-April around the Mediterranean, mid-September to November in India and Pakistan, and September-January or April in Ethiopia) (Smithson et al., 1985). In northern Thailand, chickpea should be planted after the rains subside at the beginning of the cold season (October-November).

Length of production and harvest period – Chickpeas mature in 3-7 months and the leaves turn brown/yellow during maturity. Varieties vary in production time from 45-75 days from seed to flower.

Pollination – Chickpea is a self-pollinated crop. Cross-pollination is rare; only 0-1 % is reported.

Plant spacing – Seed is broadcast or (more often) drilled in rows 25-60 cm apart, spaced at 10 cm between seeds, at a depth of 2-12 cm with soil well pressed down.

Production methods – Chickpeas are propagated from seeds. Seeding rates vary from 25-40 kg/ha to 80-120 kg/ha, depending on the area and seed type (Smithson et al., 1985). Chickpea may be cultivated as a sole crop, or mixed with barley, lathyrus (grasspea), linseed, mustard, peas, corn, coffee, safflower, potato, sweet potato, sorghum, or wheat. In rotation, it often follows wheat, barley, rice, or tef (van der Maesen, 1972). In India, chickpeas are also grown as a catch crop in sugarcane fields and often as a second crop after rice. Although usually considered a dry-land crop, chickpeas develop well on rice lands. In many areas, chickpeas are weeded when young (3-4 weeks after sowing); thereafter, the crop develops enough shade to smother weeds. In other areas, light weeding is recommended. Seed inoculation improves yield only for crops grown for the first time or after rice, where *Rhizobium* populations are naturally low or absent. Irrigation at 45 and 75 days after planting is useful (Duke, 1981).

Environmental conditions for production – Chickpeas are usually grown as a rain-fed cool-weather crop or as a dry climate crop in semi-arid regions. Optimum conditions include daily temperature fluctuations (18-26°C at night and 21-29°C during the day) and annual rainfall of 600-1000 mm (Duke, 1981; Muehlbauer et al., 1982; Smithson et al., 1985). Chickpea thrives on a sunny site in a cool, dry climate on well-drained soils and grows on a residual moisture in the post-rainy seasons of sub tropical winter or spring of the northern hemisphere (Smithson et al., 1985).

Soil requirements – Chickpea prefers a light, well-drained, fertile soil. It grows well at pH values between 5.5 and 8.6 (Duke, 1981).

Pests – There are two fungi that most notably affect chickpea: (1) *Fusarium oxysporum* Schlechtend.:Fr. *f. sp. ciceris*, which causes the plant to wilt, and (2) *Ascochyta rabiei*, which causes the Ascochyta blight. The Ascochyta blight is the most serious disease in North India, Pakistan, the United States, and the Middle East - sometimes causing 100% losses (Smithson et al., 1985). The Ascochyta blight causes brown spots on leaves, stems, pods and seeds (Kaiser, 1992). Other fungi known to attack chickpea include leaf spot (*Alternaria* sp.), rust (*Uromyces ciceris-orientini*), gray mold (*Botrytis cinera*), powdery mildew (*Leviellula taurica*), damping off (caused by *Pythium debar-yanum*, *R. solani*, and *P. ultimum*,

among others), dry root rot (*Rhizoctonia bataticola*), white mold (*Sclerotinia sclerotiorum*), and wilt (*Verticillium albo-atrum*).

Chickpea growers may encounter the following insect pests: pod borer (*Helicoverpa armigera*), which feeds on leaves and developing seeds (Smithson et al., 1985), cutworms (*Agrotis* sp.), lesser armyworms (*Spodoptera exigua*), and leaf miner (*Lepidoptera, Symphyta, Diptera*). Groundnut aphid (*Aphis craccivora*), pea aphid (*Acyrtosiphon pisum*), cowpea bean seed beetle (*Callosobruchus maculatus*), and Adzuki bean seed beetle (*C. chinensis*) are also important. Many storage insects (specifically seed beetles, *Bruchid* spp.) are a serious pest of stored chickpea. Chickpeas stored as dhal harbor fewer seed beetles.

Seed saving – For dry seeds, the plants are harvested at maturity or slightly earlier by cutting them close to the ground or uprooting. The plants are then stacked in the field for a few days to dry and later the crop is threshed by trampling or beating with wooden flails. The chaff is separated from the grain by winnowing. Chickpeas are usually stored in bags, but are more subject to insect damage in this condition than when stored in bulk. Proper cleaning, drying, and aeration are necessary to control seed beetles. A thin coating with vegetable oil can reduce storage damage.

References –

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