

ECHO Asia Seed Fact Sheet

Scientific name – *Psophocarpus tetragonolobus*

English common name – Winged bean; also known as asparagus pea, four-angled bean

Asian common names –

- Burmese: pe saung ya
- Chinese: 四棱豆 si leng dou
- Hindi: chaukoni sem
- Japanese: シカクマメ shikaku mame
- Khmer: prâpiëy
- Korean: 날개콩
- Lao: thwàx ph'uu
- Malay: kacang belimbing
- Tagalog: segidilla
- Thai: ถั่วพู thua phuu
- Visayan: kalamismis, kabey



Photo: ECHO Asia staff

Variety

- **Day-Neutral** - Blooms during longer days, allowing out of season production.
- **Pang Daeng Nawk** – Short day-length variety from northern Thailand, produces long, tender pods (30 cm/12 in).

General description and special characteristics – A climbing perennial with large pale blue flowers that produce 15-20 cm (6-8 in) winged pods at maturity. It can be planted as an annual or perennial.

Crop uses (culinary) – The leaves, shoots, flowers, pods and seeds are all edible. The root tuber is white and firm and averages 20 percent protein. In Papua New Guinea, the tubers are eaten roasted and have a pleasant, slightly nutty taste; they can also be eaten raw. Young pods, harvested while still tender and bendable, can be boiled and served like french beans or dipped in sauces and curries. The green seeds from both immature and mature pods are consumed, while ripe seeds can be roasted before eating. The nutritional composition of winged bean seeds is comparable to that of soybean with approximately 30 percent protein. In Indonesia, dried seeds are fermented to prepare a meat substitute called “tempeh” or processed to produce tofu. Protein-rich bean milk and flour are useful dietary treatments for protein-deprived children. Flowers eaten steamed or fried have the color and consistency of mushrooms.

Crop uses (soil improvement) – Winged bean is a good nitrogen-fixing species and is intercropped with bananas, sugarcane, taro, and other species as a green manure/cover crop. It has exceptional capacity for producing very large and numerous root nodules.

Crops uses (livestock production) – Stems, leaves, and processed seeds can be used as fodder (AVRDC). In Bangladesh, winged bean stems and leaves are used as cattle forage.

Other uses – AVRDC reports that seeds are used as sources of edible oil, milk, and flour.

Seasons of production – Most varieties are planted at the beginning of the rainy season. Short-day varieties will begin flower and fruit production when day length decreases (normally a day length of 12 hours or less is required for flower initiation). With adequate moisture, day-neutral varieties can be produced year round.

Length of production and harvest period – Flowering occurs within three to four months of planting. After setting pods, the vines may die but new shoots are produced from the tuberous roots. The tubers are harvested approximately seven to eight months after sowing; medium tubers, a little thicker than the thumb, are regarded as having the best flavor. Flexible young green pods can be ready for eating six to ten weeks after sowing.

Production methods – For improved germination, soak seeds overnight before planting. Use trellises or other support. In Myanmar, seeds are planted three to six inches apart to encourage root production. If flowers are picked as they emerge, tuber production is enhanced.

Plant spacing – Rows should be spaced two meters apart and hills within rows separated by 1-2 meters (3-6 ft). Plant 2-3 seeds per hill.

Pollination information – Winged bean is self-pollinating and will not cross with any other vegetable. Information on possible insect cross-pollination between different varieties of winged bean is unavailable (Ashworth 1991).

Environmental conditions for production – Widely distributed through the tropics and subtropics, winged bean thrives in hot, wet climates, although a dry period is favorable to fertilization and the production of mature pods. It can, however, be grown in the tropics at elevations up to 2100 m (6,890 ft).

Soil requirements – Winged bean grows well under a variety of soil conditions except in sand or high salinity environments. Adding manure/fertilizing every 2-3 weeks sustains pod development. Wood ash and other potash fertilizers improve yields. However, winged bean is drought sensitive; mulching helps to retain soil moisture in drier seasons and enhances tuber development in both wet and dry seasons. In Myanmar, it is often grown under irrigation.

Pests and diseases – Winged bean is relatively free of insect pests but is susceptible to attack by fungi including powdery mildew and leaf spot that may spread rapidly. In some regions, nematodes cause heavy yield losses.

Seed saving – Seeds are easily removed from dry pods. Pods can be split apart by various means. Seeds store well in dry, cool, dark locations.

References –

Ashworth, S.. 1991. Seed to Seed. Decorah, Iowa: Seed Savers Exchange, Inc.

AVRDC. Know Your IVs: Winged Bean. IV Leaflet No. 1. AVRDC, The World Vegetable Center. Available: http://203.64.245.173/iv_sea/publications/wingedbean.pdf.

Bunch, R. 2007. Changing our Understanding of the Fertility of Tropical Soils. *Psophocarpus tetragonolobus*. FAO - Food and Agriculture Organization of the UN. Available: <http://ecocrop.fao.org/ecocrop/srv/en/cropView?id=1666..>

ECHO Plant information sheet. ECHO, Inc. Available: <http://www.echonet.org/content/100underutilized/778>.

Ecocrop. 2007. *Psophocarpus tetragonolobus*. FAO - Food and Agriculture Organization of the UN. Available: <http://ecocrop.fao.org/ecocrop/srv/en/cropView?id=1807>.

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