

# INCA NUT

Inca nut, Inca Peanut, Sacha Inchi, Sacha Peanut, Mountain Peanut

*Plukenetia volubilis*

Euphorbiaceae

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## ECHO® PLANT INFORMATION SHEET

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### Description

Inca nut is a semi-woody, perennial, vining plant with large (~10 cm wide), heart-shaped leaves. It is monoecious, with individual plants having both male and female flowers. Each inflorescence (group of flowers on a plant stem) has one or two female flowers and about 60 male flowers. Successful insect pollination results in star-shaped fruits 3 to 5 cm wide with four to seven capsules, each containing a brown, oval seed 1.5 to 2 cm in diameter.

### Origin

Inca nut is native to the Andean rain forests of South America. Much of the literature mentions its natural occurrence in the Peruvian Amazon. It is now cultivated elsewhere, including parts of Asia.

### Uses

The leaves and seeds of Inca nut have been used as a wild food source for centuries. In more recent years, it has gained attention for the health-enhancing oil contained in the seeds. The by-product (seed cake/pulp) that remains after oil extraction serves as a protein-rich (45 - 60%) feed for animals and fish, and is used for making flour, bread, soap, cosmetics and medicinal cream.

### Common Names

### Cultivation

**Elevation** - 900 - 1700 m

**Rainfall** - 850 - 1000 mm; best if evenly distributed over 12 months. Irrigation is important during dry months, though overwatering increases disease problems.

**Soil Types** - wide range, but prefers medium-textured soils (sandy or clay loams) over heavy clays and very sandy soils. Inca nut is not overly demanding in terms of soil nutrients required. Soil pH should be between 5.5 and 7.8; it is a good option for acidic soils with high aluminum levels.

**Temperature Range** - 0 - 36°C; temperatures higher than 36 °C cause drop-off of flowers and immature fruit, while temperatures below the optimum slow growth and flowering.

**Light** - Prefers full sun; though it grows with other plants in forests, low light reduces flowering and subsequent fruiting.

To avoid deforestation, consider the extent to which land-clearing and the cutting of hardwoods—for trellis support of the vines—will occur. Inca nut is an excellent choice for small-scale production around the home, in small clearings, or around the edges of farmers' fields. In such settings, it can be grown with other perennials for vine support.

Select a site that is well drained. Some leveling of the ground may be needed to keep water from pooling around the plants. Loosen the soil to a depth of 30 to 40 cm, incorporating organic matter (e.g. animal manure) to improve soil structure.

Inca nut is propagated mainly by seeds. Plant at the beginning of the rainy season unless irrigating, in which case it is possible to plant any time of the year. After removal from dry/mature pod capsules, seeds can be sown 2 to 3 cm deep in the field or in nursery beds. Whether direct-seeding into the field, or transplanting seedlings from a nursery, aim for a final in-row plant spacing of 2.5 to 3 m, with 3 m between rows; this will require 1 to 1.5 kg of seed per ha. For oil production, consider a narrower spacing of 1.5 X 1.5 m, as this was shown to be optimal in a study in China.

Vines typically climb to a height of 2 m and need to be supported. The plants respond well to fertilizer and can also be intercropped with low-growing crops such as peanuts, beans and cotton

### Harvesting and Seed Production

Flowering occurs 5 to 6 months after planting, with fruits maturing by 8 months after planting.

Harvesting dry and mature fruit takes place 6-8 months after planting. After the first harvest, plants continue to fruit, and can be harvested every 20 to 25 days, with best yields during the rainy season.

To avoid having to handle the messy black pulp in developing fruits, allow them to dry on the plant. For clean seed, harvest brown capsules still attached to the plant, avoiding fruits that have fallen to the ground. Capsules are then dried, traditionally in the sun, which helps the capsules to split open so the seeds can easily be removed.

After the initial harvest, plants continue to fruit and can be harvested every 3 weeks. With adequate water and the absence of frost, Inca nut

produces fruit multiple times per year. Maximum fruiting may not occur until the 2<sup>nd</sup> or 3<sup>rd</sup> year. During a growing season, depending on plant spacing, each Inca nut plant can yield from 200 (with 2500 plants/ha) to 500 (with 1667 plants/ha) seeds. Seeds can be stored in sacks in dry places.

## Pests and Diseases

Inca nut plant roots may be damaged by nematodes from genera including *Aphelenchus*, *Helicotylenchus*, *Meloidogyne*, *Trichodorus*, *Tylenchus*, and *Xiphinema*. Leaves and stems can be damaged by fungi of various genera including *Fusarium*, *Stagonospora*, *Leptosphaeria*, *Rhizoctonia*, *Cronartium*, and *Colletotrichum*. Organic matter can help mitigate against parasitic nematodes. Good site selection (well-drained, with exposure to sunlight) and adequate plant spacing (to allow air circulation around the plants) are important for minimizing fungal problems.

## Cooking and Nutrition

Inca nut seeds are a valuable source of plant-based oil (35-60%), protein (27%), iodine and vitamins A and E. The yellow-orange, edible oil stores well (best at low temperature) and contains a well-balanced mix of omega-3 (alpha linolenic acid [ALA]) and omega-6 (linoleic acid [LA]) fatty acids that humans need but can only obtain through their diet. These fatty acids, linked with low cholesterol and heart health, are a good alternative to fish oil, which may not always be available. To extract the oil, seeds are “cold-pressed” to avoid damaging heat-sensitive omega fatty acids. The material that remains is used to make flour (also called “protein powder”). The oil and flour are incorporated into various foods and beverages. Raw seeds are bitter-tasting, but roasting (done at low heat) makes them very palatable. Leaves can be cooked and eaten as a vegetable.

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