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2021-2022

SEED CATALOG



ECHO Asia Seed Catalogue 2021-2022

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For further resources or seeds, including networking with other agricultural and community development practitioners, please visit our website: [ECHOCommunity.org/regions/ASIA](https://echocommunity.org/regions/ASIA).

FOREWORD

Seeds are a strategic starting point for any agricultural development program or project, and good seeds are undoubtedly one of the most important material inputs for farmers, both men and women. In some farming communities and families, seeds are the most significant predictor of productivity. For subsistence and small-scale farmers, whose resources are limited and risk taking capacity is low, what matters most are seeds that are yield-dependable, climate-smart and sustainable. Seed security – access to enough quality seed at times of planting – is paramount.

ECHO Asia has been operating a seed bank in Thailand since 2009, the first seed bank outside of ECHO Inc. Florida Headquarters. The goal of the ECHO Asia Seed Bank is to serve as a resource facility for development workers within the region who wish to experiment with and/or promote underutilized crops as they find ways to improve the lives of the poor. The seed bank maintains a collection of hard-to-find seeds that thrive under difficult growing conditions in the tropics and sub-tropics and are appropriate to sustainable agriculture practices.

Through the ECHO Asia Seed Bank, members of the ECHO community network can either acquire free small sample packets for free or purchase bulk orders of selected seeds. This transaction is aided by this catalog, the "ECHO Asia Seed Catalog."

ECHO Asia endeavors to keep the Seed Bank Catalog up-to-date reflecting our discovery, collection and acquisition of seeds as we travel around Asia in the course of conducting training and networking activities and events with partners. This version of the ECHO Asia Seed Bank Catalog provides the latest collection of seeds categorized into fruits, grains, herbs and plants suitable for botanical pesticides, legumes, oil seeds, pulses and green manure/cover crops, vegetables and seed bundles.

We hope that this catalog will greatly facilitate the choice and access of many small-scale farmers. Above all, we trust that it will effectively support the ECHO mission of reducing hunger and improving the lives of small-scale farmers worldwide.



Eduardo A. Sabio, Ph.D.
Regional Director
ECHO Asia

HISTORY OF ECHO ASIA SEED BANK

HOW IT ALL STARTED:

ECHO Asia, a regional extension arm of ECHO Inc., exists to equip and empower workers in agriculture and community development to be more effective in their work with small-scale farmers and the poor in Asia to improve food security and livelihoods.

Established in 2008, the ECHO Asia project initially consisted of a small office in Chiang Mai and a seed bank facility at the Upland Holistic Development Project (UHDP) Agroforestry and Small Farm Resource Center in the Mae Ai District of Chiang Mai province.

Beginning in 2017, ECHO Asia began to move the seed bank from Mae Ai to Chiang Mai, just 25 minutes from the Chiang Mai office. The current site sits on 4 hectares and features a seed bank storage facility; seed production plots; biochar, composting, urban gardening, Black Soldier Fly production, animal raising and feedstock production demonstration areas; research facilities; an agroforestry lane; and training facilities. The move was completed in 2019 and ongoing work on the farm is focused on initiatives that will better serve our partners in the ECHO Asia network.

The ECHO Asia Seed Bank is committed to providing open-pollinated seeds that can be saved and replanted continuously, allowing farmers a self-sufficient seed supply.



The ECHO Asia Small Farm Resource Center & Seed Bank is only 25 minutes outside of Chiang Mai!

ABOUT ECHO ASIA

ECHO ASIA IMPACT CENTER:

ECHO Asia, a regional extension arm of ECHO Inc., exists to equip and empower workers in agriculture and community development so that they can be more effective in their work with small-scale farmers and the poor in Asia to improve food security and livelihoods.



We do this by providing free resources, information, training, and seeds to our network members residing in Asia.

SERVICES OFFERED:

Producing **a catalog of nearly 200 seeds** from the ECHO Asia Seed Bank with a continuously expanding seed inventory that is available for sale on ECHOcommunity.org. Our members qualify for 10 free seed packets per year! We also love sharing our learning about **seed saving and seed banking techniques!**

Writing and disseminating our quarterly **ECHO Asia Notes**, which include technical articles on a wide variety of topics as well as information on upcoming events and happenings in the network. We currently translate these articles into 7 regional languages including Thai, Burmese, Vietnamese, Mandarin, Indonesian, Hindi and Khmer. All of these resources are available in ECHOcommunity.org.

Hosting **Agriculture and Community Development events** both on the regional and country-wide level with organizational partners in order to offer context-relevant information in local languages. In doing so, we desire to “echo” and promote good agricultural practices happening in Asia!

Partnering with our network to print **expanded resources for sale and in our resource library**. We have nearly 60 books available at cost at the office and a resource library of nearly 850!

Offering **technical responses to field questions** from our network.

Providing **on-site consultations** for organizations and individuals.

Promoting **Volunteer Opportunities & Internships** available to our network and those that wish to learn more about sustainable agriculture, seed banking, research and living cross-culturally.

VISITING THE IMPACT CENTER & SEED BANK:

We are pleased to welcome visitors to our Small Farm Resource Center & Seed Bank in San Pa Pao, San Sai, Chiang Mai! If you are interested in taking a tour, please contact us by email (asiahospitality@echonet.org). At this time, we are NOT open on the weekends, but we would be pleased to offer a tour Tuesday-Friday mornings. The map below can guide local drivers to our location. The “ECHO Asia Impact Center Farm & Seed Bank” is also clearly marked on Google Maps.



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SEED ORDERING & RESEARCH STEPS

STEP #1: ORDER SEEDS

Go to the ECHO Asia Seed Bank store on ECHOcommunity.org. If you are a member of ECHOcommunity, it is free! You can order seed, register for events, subscribe to publications like the quarterly ECHO Asia Notes, and much more!

If you are an active worker in agriculture and community development, you are eligible for **10 free sample seed packets** per calendar year (shipping included). Please enter the promotional code "**FreeAsiaSeeds**" at checkout. We are able to ship seed to most (but not all) countries in SouthEast Asia. If you are not sure if you can receive seed from outside your country, please contact us and we can help you determine this.

If you are ordering more than 10 small packets or if you are ordering seed in bulk, these options are **not** eligible for the promo code. After we have your order, we will calculate the final cost (including shipping) and send an invoice to you for final payment.



STEP #2: TAKE PRECAUTIONS

ECHO supplies small packets of open-pollinating seed for trial. It is important to understand that the plants must be treated as experimental before making recommendations to members of your community. Promoting "miracle technologies" or "wonder plants" before giving them adequate trial and experimentation on-site can have serious consequences for your work or ministry.



STEP #3: OBSERVE

Before disseminating seeds in the wider community, it is important to conduct trials to find the conditions and seasons of optimal performance. Likewise, it is important to watch the planting carefully the first few seasons to make sure it is not likely to produce too aggressively.

Throughout each planting season, take time to write down general impressions on your seeds' suitability to the locality and culture.

In all cases, we look upon those who request seeds as collaborators with us in field trials. This does not mean that you must conduct elaborate experimentation, but we highly value all information you can share with us about your seeds.



STEP #4: REPORT

Let us know what happened! After your crop has been harvested, you may begin a **"Seed Trial Report" on the ECHO Mobile App.** This free app has been developed to help you use and share resources when your work extends out beyond your internet connection. You can download the app in the Apple App Store or on Google Play.



HOW TO USE THIS CATALOG

SEED INFO ORGANIZATION:

Each seed entry has the same format. If you are looking for a specific piece of information, such as the Latin name or elevation, **refer to the example below.**

EXAMPLE SEED ENTRY:

Latin Name

English Common Name(s)

ชื่อสามัญภาษาไทย

Varieties: Variety name 1, Variety name 2

elevation: 1000-3000m



Here you will find a description of the plant, including information regarding rainfall needs, planting depth, and specific uses.



Variety 1
Information specific to this variety.



Variety 2
Information specific to this variety.

SYMBOL KEY:



Fodder: plant can be used to feed animals



Non-Edible: plant is toxic for human consumption



Warning: read plant description carefully

INDEX:

If you are looking for a particular species or variety, refer to the index at the back of the catalog. Plants are alphabetically sorted by Latin name, English common name, and Thai name.

Invitation to Participate!

This Seed Catalog represents the information we have collected thus far on the plants and plant varieties included. However, there remains a lot to learn. If you find a mistake in this document and/or have relevant information that we could add to future versions, please let us know. We would love to continue to grow in the quality of content that we are able to offer to our partners.

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FRUITS ผลไม้

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Carica papaya

Papaya

ມະລະກວ

Varieties: Sunrise Solo, UHDP

Papaya is grown throughout the tropics for its fruit. It is eaten fresh, both as a vegetable when green and under-ripe, and as a fruit once soft and the color turns a yellowish-pink. The leaves can also be cooked and eaten as a vegetable. Papaya is grown from seed and is often initiated by sowing directly at 5 cm apart and 1 cm deep, in rows 15 cm apart. At about 6-8 weeks, plants are transplanted into rows or ridges. Papaya prefers humid tropical climates with 1500 mm of rain or more, but it is sensitive to flooding. A shallow-rooted plant, Papaya is susceptible to wind-damage. Plants are typically unisex, but some are male or female, with only female plants producing fruits. After plants reach the flowering stage, they can be reduced to one male flowering plant for every 15-25 female plants. The trees are pollinated by moths.

**elevation: best below 900m,
up to 2100m**



Sunrise Solo

A fleshy, short variety.

UHDP

Tall plant. Long-shaped fruit, sweet in flavor.

Cucumis melo

Muskmelon

ແຕງລາຍ

Varieties: Cambodia

Muskmelon, also known as Cantaloupe, Mash Melon, Melo, and Pepo, is a creeping annual gourd producing round or oval fruits, 10-15 cm in diameter with a rough, scaly, netted outside skin. Muskmelons were originally grown in the hot, dry savanna regions of Africa and southwest Asia. Egyptian, Chinese and Greek art included this edible fruit from the year 3000 BC. The seeds yield edible oil that is used as an ingredient in fragrances and cosmetics. Known as "Thai Melon" in Thailand, this fruit has a strong smell and mild sweet flesh. It is used in Thai desserts, smoothies, and eaten with chilli sauce. It is pest resistant, so watch for excessive growth. However, it is a very sensitive plant, so do not touch the young fruit or flowers. It can be used as a cover crop or for intercropping, for example, with highland rice.

elevation: 0-1000m



Cambodia

Light green, sweet flesh with many seeds.



Passiflora edulis **Passion Fruit**

ສາວຮສ

Varieties: Yellow

A woody perennial that climbs with a trellis, Passion Fruit is grown for its seedy pulp that is both sweet and tart in flavor. It is eaten fresh, used in smoothies or juices, or for making desserts. It is a subtropical fruit that can be grown between sea level and 1,300 meters. Propagated by seed, it requires cross-pollination. The vine requires an annual rainfall of 900 mm and can be grown on many soil types, but prefers sandy loam with a pH of 6.5 to 7.5. Good drainage is important. Regular watering will keep a vine flowering and fruiting almost continuously.

elevation: 0-1300m



Photo Credit: Kimberly B. Duncan

Yellow

Sweet and sour flavor. When ripe, the fruit is yellow.

Physalis peruviana **Cape Gooseberry** ໂທເຫງ **Varieties: Royal Project**

The unripe fruits of a Cape Gooseberry are green and develop a golden-orange hue when ready for consumption. When ripe, gooseberries should fall upon shaking the branches and will continue to ripen over the course of a few weeks. The size of ripe gooseberries varies considerably: some large fruits are the size of a golf ball, while small ones are the size of a marble. Look for fruits with a round, smooth exterior and glossy sheen.

Caution: unripe berries are toxic, and have caused deaths and illnesses amongst Australia's cattle populations. Few reports, however, indicate that unripe fruits are severely toxic for humans. To err on the safe side, wait until the fruit is fully ripe before consuming. Cape Gooseberries are high in vitamins A and C. The ripe fruits also have concentrations of beta-carotene, calcium, iron, phosphorus, potassium, bioflavonoids, protein, and fiber.

elevation: 300-2400m



Royal Project

Looks and tastes like a sweet yellow-orange version of a cherry tomato. Paper-like sheath on the outside should be removed before eating.

GRAINS რំលូដីជ

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Amaranthus cruentus

Grain Amaranth

ຜັກໃໝມເມລືດ

Varieties: Mexican, PI 538320, PI 538321, PI 538255, PI 606767

The young leaves and stems of Grain Amaranth can be cooked and eaten like spinach, but the plant is mainly grown for its high protein grain (~12-16%). If roasted in a hot pan, Amaranth seeds pop like popcorn, making nutrients more accessible. Leaves can be prepared according to local cooking customs for other leafy vegetables. Leaves and stalks can also be used as livestock feed. Grain Amaranth flowers and sets seed in response to shortening days. The plant grows best in warm temperatures with sufficient soil moisture. Amaranth tolerates poor soil, fertility and drought and responds well to fertilization. Soil pH above 6.0 is recommended.

PI 606767

Light brown inflorescence.



PI 538255

Yellow inflorescence, white stem.



PI 538321

Red flowers. White Seeds.



Mexican

White and yellow flowers. White Seeds.



PI 538320

Red inflorescence, white stem.



Chenopodium quinoa

Quinoa

គ្រឿងា

Varieties: Australia

Quinoa is a flowering plant in the Amaranth family grown primarily for its edible seeds, which are rich in protein, dietary fiber, B vitamins, and dietary minerals in amounts greater than in many grains. Quinoa is not a grass, but rather a pseudocereal related to spinach and amaranth originating in Northwestern South America. Usually about 1-2 m high, it has broad, generally powdery, hairy, lobed leaves, normally arranged alternately. The woody central stem may be green, red or purple. The seeds are about 2 mm in diameter and of various colors—from white to red or black, depending on the variety. Generally undemanding and altitude-hardy, Quinoa prefers cool climates with temperatures that vary between -4°C during the night to near 35°C during the day. Well-distributed rainfall during early growth and no rain during seed maturation and harvesting is optimal. Quinoa plants do best in sandy, well-drained soils with a low nutrient content, moderate salinity, and a soil pH of 6 to 8.5. The seedbed must be well prepared and drained to avoid water-logging.

elevation: up to 4000m

Australia

Green stem, leaves and flowers covered with a soft, white fuzz. Tan coloured seeds.



Coix lachryma-jobi

Job's Tears

តុកពេជីយ

Varieties: Decorative Mix, Mekong Mix

Despite its minor crop status, Job's Tears is a nutritious grain, containing more fat and protein than rice and wheat. Both sticky and non-glutinous varieties are grown throughout much of South and Southeast Asia, as well as parts of China. This grain can be eaten like rice, ground into flour, added to soups and snacks, and fermented. It is also fed to poultry and the foliage used as fodder. Seeds of certain varieties are used as beads for decoration. Often planted at the beginning of rainy season, it requires fertile soil for its best growth. In poor soils, many of the fruits are hollow. Job's Tears is reportedly best suited to latitudes between 22°N and 22°S.

elevation: up to 2000m



Mekong Mix

A soft, round, edible variety. 120 days from seed to flower. Seed coat turns gray or black when mature.

Decorative Mix

Non-edible mix of three decorative varieties: two thin and long, one short and round. Used for embroidery and jewelry.

Salvia hispanica **Chia**

เมล็ดเชีย

Varieties: Chiang Mai

Chia is an annual herbaceous plant in the mint family that grows to about 1.5 m in height. It originates from Central America, where it has been grown primarily for its tiny, but highly nutritious, seeds. Best planted towards the end of the rainy season, the harvest of mature Chia seeds takes place approximately four months later. Too much moisture during seed-setting and maturity can lead to harmful mold and bacteria growth on the seeds. Chia seeds yield 25-30% extractable oil, rich in essential fatty acids. It is one of the highest known sources of Omega-3 fatty acids. Seeds can be added to any meal or drink and can be digested without breaking the seed coat. The widely acclaimed health benefits of Chia can be attributed to its overall high nutrient content: it is high in soluble fiber, 20-23% protein, rich in antioxidants and minerals. Seeds soaked in water will dissolve to create a gel that can be used in other cooking and mixed into juices. Leaves can be steeped to make tea used for a myriad of health problems.

elevation: 400-2500m



Chiang Mai
Multicolored seeds:
white, brown and
grey. From plants
naturalized in
Northern Thailand.



Setaria italica **Foxtail Millet**

ข้าวฟ่างหางกระออง

Varieties: Chiang Dao

As with other grains, Foxtail Millet can be ground for flour, used as a beverage base, boiled for porridge, or roasted. An annual grass, Millet has been cultivated in China since the sixth millennium BC. Thus, an alternate name for the grain is "Chinese Millet". A staple in many countries, it is also useful as a forage. Foxtail Millet can be grown up to an elevation of 1,800 m and up to a latitude of 50° N. It prefers sandy loam to clay loam soils and is a water efficient (25-30 cm per crop), warm-weather crop. In Thailand, Foxtail Millet is sometimes intercropped with upland rice and can be planted during the rainy season or during the dry season with irrigation.

elevation: up to 1800m



Photo Credit: Kimberly B. Duncan

Chiang Dao

From North Thailand's Chiang Dao district. Requires approximately 120 days. About 2 m high. Yellow-brown seeds.

Sorghum bicolor **Sorghum**

ข้าวฟ่าง

Varieties: Local Thai, Pang Daeng, PI 521344

Sorghum is a 3-meter tall minor grain crop, often intercropped with upland rice. The grain is cooked like rice or popped like popcorn. Around the world, various types of Sorghum are cracked like oats for porridge, malted for beer, or baked like wheat into flatbreads. Grain is also fed raw to chickens, or cooked as pig feed. Sorghum is usually planted at the beginning of the rainy season in Northern Thailand and harvested at the beginning of the dry season (after approximately 6 months). Sorghum can be grown from sea level to 1,000 m; rainfall of 200-1,250 mm is preferred. Adapted to a wide range of soils if moderately well-drained, a pH of 5.0-8.5 is best. While it is well-adapted to areas with low rainfall, high temperatures will not produce a reliable crop.

elevation: 0-1000m



PI 521344

A sweet sorghum variety. Seeds are red. The plant takes about five months to produce seed.



Pang Daeng

A local grain sorghum variety. Mostly grown for livestock feed.

Zea mays var. everta

Popcorn

ข้าวโพดคั่ว

Varieties: Lampang, Naga, Timor Island

elevation: up to 2000m



Timor Island

Pearly white kernels.

Naga

From Northeast India. Small ears with hard, round, yellow kernels. Hardy crop.

Lampang

Small, dark red kernels.

Zea mays var. indurata

elevation: up to 2000m

Flint Corn

ข้าวโพด/ข้าวสาร

Varieties: Chiang Dao, Dark Purple, Dark Red, Esaan, Lampang, Naga Multi-Colored, Naga Light Yellow, Orange, Samoeng Purple, Wachichu, White & Light Red

Flint Corn is generally characterized by mid-sized ears with multi-colored kernels that grow vigorously under suitable conditions. Flint Corn has a "flinty" seed coat, is hardy, and is grown for both human and livestock consumption. A carbohydrate-rich food source, the immature kernels are consumed raw, cooked, or roasted. Grains are pounded or ground as meal or flour to be used in baking or as cooked cereal. Kernels are often soaked prior to grinding and after fermentation and can be used to prepare dishes such as "kenkey" or "pozol". Cornstarch is used as a thickening agent. Young tassels may be boiled and eaten and the pollen used as a soup ingredient. Corn is an important feed source for poultry, swine, and cattle. The whole plant is used as green fodder or as silage for cattle, with kernels processed into various types of feed. Ground cobs may be used as litter material for animal bedding. Flint Corn is a warm climate crop that thrives in open, sunny environments with daytime temperatures of 20-24°C. Rainfall during the growth period should be 500 mm or more. Flint Corn can be planted during the rainy season or during the dry season with irrigation. It prefers full sun and well-drained soil and grows best with a pH of 6.0-7.0.



White & Light Red
Kernels are a range of colours: white, pale yellow, and light rose.



Light Yellow
Tall plant with slender, light yellow kernels. Used for fodder.



Esaan
Faded blue kernels.



Wachichu
Heirloom variety from USA. Orange, to light purple, to white kernels.



Samoeng Purple
Dark purple kernels.



Lampang
White kernels with occasional purple kernels.



Orange
Multi-colored orange and yellow kernels. Full shape. Used for fodder.



Chiang Dao
Similar to Lampang variety. White kernels.



Naga Multi-Colored
From Northeast India. Mid-sized ears with multi-colored kernels.



Dark Purple
Sticky, sweet, dark purple kernels. 10-15cm long.



Dark Red
Wine-red kernels. 19 cm long.

Zea mays var. saccharata

elevation: up to 2000m

Sweet Corn

ข้าวโพดหวาน

Varieties: Esaan Yellow, Hawaiian Supersweet #9, Silver Sweet Corn

Sweet Corn is sweeter than other types of corn because the endosperm, before becoming ripe and dry, contains sugar as well as starch. Sweet Corn grows well in tropical conditions and during the rainy season, though it may be grown during the dry season if irrigated. Sweet Corn prefers full sun and well-drained soil. It grows best with a pH of 6.0-7.0.

Hawaiian Supersweet #9 (L)

Yellow sweet corn developed by the University of Hawaii for the tropics. Matures in 68-75 days.

Esaan Yellow (C)

Similar to Hawaiian Supersweet #9. 111 days to harvest.

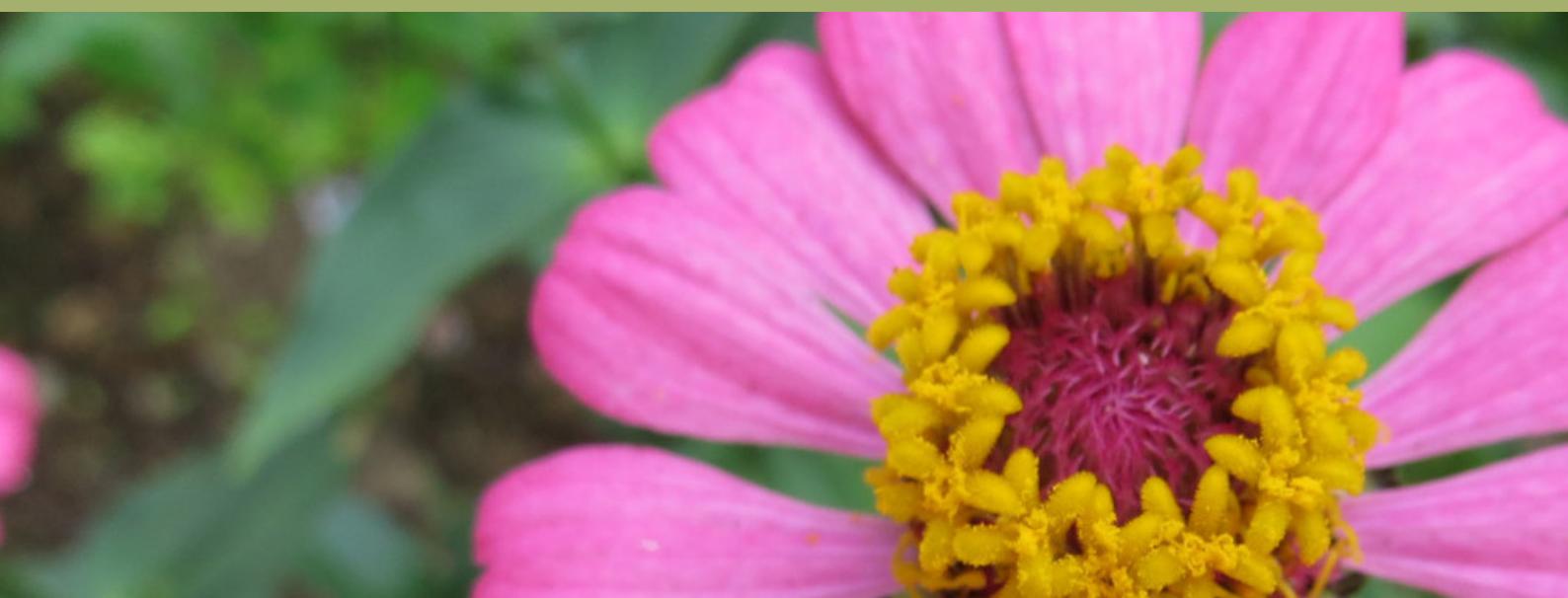
Silver Sweet Corn (R)

Similar to Hawaiian Supersweet #9. White in color.



HERBS & INTEGRATED PEST MANAGEMENT การจัดการศัตรูพืชแบบผสมผสาน

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Anethum graveolens

Dill

ຜັກຊື່ລາວ

Varieties: Burmese

Dill is an annual plant cultivated for its seeds and leaves. It is tall and feathery-leaved with yellow flowers and a pungent smell. Its leaves can be used medicinally and in cooking. It is also used in Integrated Pest Management systems to attract beneficial insects such as parasitic wasps. The plant can be seeded directly: either broadcasted or planted in rows; it does not transplant well. It prefers moderately rich soils, an annual rainfall of 500-1500 mm and temperatures of 7-29°C. It prefers full sun, but will bolt in hot, dry weather.

elevation: above 200m



Burmese

A tall, well-branched plant. Bluish-green in color and disease-resistant.

Calendula officinalis

Calendula

ດາວເຮືອງໜົວ

Varieties: Orange Zinger

Calendula is a flowering plant in the Daisy family. Growing to 80 cm tall, its leaves are spirally arranged, 5-18 cm long, and slightly hairy. The flower heads range from pastel yellow to deep orange, and are 3-7 cm across, with both ray florets and disc florets. Calendula is widely cultivated and can be grown easily in sunny locations in most kinds of soils. Although perennial, it is commonly treated as an annual, particularly in colder regions where its winter survival is poor, and in hot summer locations where it also does not survive. Seeds will germinate freely in sunny or half-sunny locations, but plants do best if planted in sunny locations with rich, well-drained soil. Plants typically bloom quickly from seed (in under two months) in bright yellows, golds, and oranges. Calendula florets are edible and are often used to add color to salads, as a garnish, or in lieu of saffron. Flowers have also been used as a medicinal herb, a dye for fabrics, and in cosmetics. Leaves can be made into a poultice that is believed to help scratches and shallow cuts to heal faster, and help prevent infection.

elevation: 900-2500m



Orange Zinger

Bright orange flowers with a gradually darkening center.

Coriandrum sativum

Coriander/Cilantro

ຜັກຊື່

Varieties: Pyin Oo Lwin

Coriander is an annual herb in the Apiaceae family. It is also known as "Chinese Parsley". The stems and leaves are usually called Cilantro in North America. All parts of the plant are edible, but the fresh leaves and the dried seeds are the parts most traditionally used in cooking.

elevation: up to 2200m



Pyin Oo Lwin

Seeds, leaves, and roots are all edible.

Cosmos bipinnatus

Cosmos

ດອກປອກຮະຈາຍ

Varieties: Sea Shell

Cosmos are effective nectaries for butterflies and can be planted to attract pollinators and other beneficial insects such as syrphid flies, lacewings, and parasitic wasps. Cosmos are also said to repel corn earworm. As a companion plant, scatter seeds at plot edges, or plant at intervals within a garden. Cosmos is a warm-weather annual that tends to re-seed itself. Highly adaptable to a wide variety of conditions, it is best planted in well-drained soil. Seeds can be covered 0.6 cm, since they do not need light to germinate. Germination will usually occur in just 3-5 days, but it can take up to 2 weeks. Tolerant of low fertility, it will become leggy if soil is too rich. It prefers neutral to alkaline pH.

elevation: 1100-2100m



Sea Shell

Feathery flower, white and pink in color. Heirloom variety from the USA.

Cosmos sulphureus

Cosmos

ดอกปอกระจาย

Varieties: Thung Kwang Tong

Cosmos are effective nectaries for butterflies and can be planted to attract pollinators and other beneficial insects such as syrphid flies, lacewings, and parasitic wasps. Cosmos are also said to repel corn earworm. As a companion plant, scatter seeds at plot edges, or plant at intervals within a garden. Cosmos is a warm-weather annual that tends to re-seed itself. Highly adaptable to a wide variety of conditions, it is best planted in well-drained soil. Seeds can be covered 0.6 cm, since they do not need light to germinate. Germination will usually occur in just 3-5 days, but it can take up to 2 weeks. Tolerant of low fertility, it will become leggy if soil is too rich. It prefers neutral to alkaline pH.

elevation: 1100-2100m

Thung Kwang

Tong

1-2 m tall
with bright
orange or
yellow
flowers.



Eryngium foetidum

Sawtooth Coriander

ผักชีฟรัง

Varieties: Local Thai

Also known as "Culantro" or "Spring Coriander", Sawtooth Coriander is a biennial or short-lived perennial native to tropical America. It is grown mainly for its leaves which are used as a culinary herb in the Caribbean, Latin America, and Southeast Asia. Plants grow 8-40 cm tall with leaves arranged in a spiral pattern around a central stem. Leaves are 5-32 cm in length, 1-4 cm wide, with small spines along the leaf edge. They have a similar aroma to Cilantro. The plant can be direct seeded or transplanted 10-15 cm apart, in rows no closer than 15 cm apart. Young leaves are harvested for use, but as the plant begins to produce flowers, the leaves become tough. Flower stalks are pruned to maintain the growth of leaves. Sawtooth Coriander prefers full sun.

elevation: up to 1700m



Local Thai

Northern Thailand variety. Easy to grow, with potent flavor.

Feoniculum vulgare

Fennel

ผักชีล้อม

Varieties: Burmese

Fennel is a short-lived perennial that is cultivated both as a flavorful, aromatic herb and a vegetable. The bulbous base of the plant, its leaves, the flowers and the seeds can all be eaten. The mature seed has a similar taste to anise and is used as a spice. The green, immature seed is even more aromatic and is used in cooking and as a flavoring for desserts such as licorice. The feathery leaves can be cooked in a variety of dishes in either their fresh or dry form. The base can be used for similar purposes and is both sweet and aromatic. Fennel can be used in an Integrated Pest Management system to attract beneficial insects. Soak seeds for improved germination, then direct seed, thinning to 30 to 45 cm apart, when they are approximately 10 cm in height. Fennel prefers a well-drained area with sun. Plants will grow to be 0.5 to 1 m in height and will start to produce flowers after 90 days. They will bloom better in the second year, provided there is enough water.

elevation: above 500m



Burmese

A short, hardy variety from Burma about 0.5 m tall.

Hibiscus acetosella

Cranberry Hibiscus

ชบาเมเป็ล

Varieties: ECHO

Cranberry Hibiscus is a medium sized, semi-perennial bush that produces edible purple-red leaves that can be eaten raw or cooked. Its flowers can be blended in teas or lemonade. The long taproots require deep, loose, well-drained soils for maximum growth. Cranberry Hibiscus is propagated from seeds or from stem cuttings. Seeds may be sown in spring time directly in field environments with well-prepared soil or transplanted as young seedlings from seedbeds to field conditions. However, Cranberry Hibiscus tends to spread easily when self-seeding. The plants need to be widely spaced to accommodate this species' wide-spreading branching habits. Cranberry Hibiscus needs rainfall of at least 500 mm during growth. It is frost sensitive and will grow in full sun, though it prefers some shade.

elevation: up to 900m

ECHO

Originally from Africa where it grows in wet climate areas.



Impatiens balsamina Rose Balsam

ດວກເពិែន

Varieties: Chiang Mai

Originally from India and Myanmar, Rose Balsam is an annual that grows throughout the tropics, subtropics and warmer areas of the temperate zone. It succeeds in any reasonably good soil, will grow in sun or semi-shade and can flower year round. About 20-75 cm tall, Rose Balsam has a thick, soft stem and spirally-arranged leaves. The flowers are pink, red, mauve, lilac, or white, and 2.5-5 cm diameter. Seed collection must be done carefully as Rose Balsam seed capsules will spring open forcibly as the seed ripens to eject the seed a considerable distance. Different parts of the plant are used as traditional remedies for disease and skin afflictions. Juice from the leaves is used to treat warts and snakebite, and the flower is applied to burns. Rose Balsam is pollinated by bees and other insects and so can be used in companion planting.

elevation: 1100-2100m

Chiang

Mai

White, pink
and mauve
flowers.



Ocimum basilicum Sweet Basil

ໂຫຣະພາ

Varieties: Local Thai

Sweet Basil is an annual herb that is used in both traditional medicine and in food for flavoring. Its leaves are used as a spice. In medicinal applications, Sweet Basil is used to treat headaches, coughs, diarrhea, and constipation. It is used in Integrated Pest Management systems both to attract and to repel certain insects, as well as for making natural pesticides. It can be grown in temperatures of 7-27°C and in areas with annual rainfall between 600-4200 mm. Basil prefers a pH range of 4.3-8.2 and can tolerate dry soils. It is sensitive to frost. Plant seeds 0.3 cm deep at about 50-60 cm apart. Plants require full sun and will grow to about 51-61 cm in height. Leaves can be harvested at any time of year; pinching young shoots off at the beginning of the rainy season will also encourage growth.

elevation: 0-2500m

Local
Thai

Dark green
leaves with
purple
flowers and
soft leaves.



Ocimum tenuiflorum Holy Basil

កំពេរា

Varieties: Local Thai

Holy Basil has similar planting, care, maintenance, and use as Sweet Basil. The plant can cross-breed with Sweet Basil. However, Holy Basil has some different culinary uses and is primarily noted for its use in stir fried dishes. Plant the seeds only about 0.3 cm deep and about 15-30 cm apart. The plant will grow about 51-61 cm in height. The growing tips and flowers should be pinched off in early spring to encourage new growth. Basil will tolerate dry soil better than most herbs. It can be grown as a potted, indoor plant if it has plenty of strong light. Several types of herbs planted together seem to produce more leaves than with each one potted separately. Growing tips, 7-8 cm long, can be rooted in water that is changed daily. The plant dies shortly after it sets seed, but can be kept longer if the spike buds are cut.

elevation: 0-2500m



Local Thai

Small leaves, blue/green in
color.

Tagetes erecta African Marigold

ទុកតារារៀង

Varieties: Africa Heirloom

African Marigolds are native to South and Central America. They can be added anywhere in the garden to serve as a beneficial companion plant as their strong odor repels pests and masks the smell of many crops, making it harder for pests to find and damage their host crop. They also attract butterflies and other beneficial insects. Marigold roots exude a nematocidal toxin which has been shown to prevent damage from nematodes when planted as a cover crop in rotation with nematode-susceptible crops. Marigolds prefer the warm season but will survive cool weather. They prefer full sun, tolerate drought, and should not be over-watered. Well-drained soil is best and the plant will tolerate both acid and alkaline soils. As a companion plant, Marigolds do well with tomatoes. However, be aware that, due to its allelopathic properties, Marigolds may stunt and reduce yields of beans and cabbages.

elevation: 0-2000m



Africa Heirloom

Prolific bloomer with large yellow and
orange double flowers on vigorous bushy
plants. 1m in height. A hardy annual.

Tagetes minuta **Nematicidal Marigold**

ดอกดาวเรืองไส้เดือนฝอย
Varieties: Nematicidal Heirloom

Marigolds can be added anywhere in the garden and serve as a beneficial companion plant. The strong odor repels pests and masks the smell of many crops, making it harder for pests to find and damage their host crop. They also attract butterflies and other beneficial insects. Marigold roots exude a nematocidal toxin which has been shown to prevent damage from nematodes when planted in rotation with nematode-susceptible crops. Marigolds prefer the warm season but will survive cool weather. They prefer full sun, tolerate drought, should not be over-watered. Well-drained soil is best and the plant will tolerate both acid and alkaline soils.

elevation: 0-2000m

Nematicidal Heirloom

Small white flowers.
Leggy plant, but a
hearty variety
effective against
nematodes.
Heirloom variety
from USA.



Tagetes patula **French Marigold**

ดอกดาวเรืองฝรั่งเศส
Varieties: Red Marietta

French Marigold is an aromatic, compact, annual plant that grows up to 40 cm in height and has showy, fragrant flowers up to 5 cm in diameter. This plant is noted for repelling nematodes. Marigolds prefer the warm season, but will survive cool weather. They prefer full sun, tolerate drought, and should not be over-watered. Well-drained soil is best and the plant will tolerate both acid and alkaline soils. As a companion plant, Marigolds do well with tomatoes. However, be aware that, due to its allelopathic properties, Marigolds may stunt and reduce yields of beans and cabbages.

elevation: 0-2000m



Red Marietta
Red flowers with yellow
edged petals.

Tithonia rotundifolia **Mexican Sunflower**

ทานตะวันเม็กซิกัน
Varieties: Local Thai

Mexican Sunflower is a woody herb or shrub, commonly grown as a perennial. Often introduced for its attractive flowers, it is now found in humid and sub-humid parts of Africa, Asia, and South America. It grows on most soils, can reach 3 m in height, and is moderately resistant to drought. It can be used for fuel, compost, fodder, soil erosion control, and building materials. It has been most effectively used as a green manure as its leaves and green stems can be applied as mulch or incorporated into the soil. Green leaves, collected before they fall to the ground as leaf litter, contain about 3.5% nitrogen, 0.37% phosphorus, and 4.1% potassium. The plant is also effective as a termite repellent when leaves and soft stems are chopped and mixed with water for 4 days then poured onto underground termite mounds. The plant prefers well-drained, moderately fertile soil in full sun. It may need to be staked and sheltered from strong winds. It grows best in hot, sunny weather.

elevation: up to 1500m



Local Thai
Plants can reach up to 1.8 m
tall and 0.6 m wide in just a
few months. Good for
companion planting.

Zinnia elegans **Zinnia**

ดอกบานชื่น
Varieties: Thung Kwang Tong

Zinnias have a yellow and black inner flower and petals of varying color. They can be planted around and in garden beds to attract beneficial insects and are often grown for sale as cut flowers. Zinnias are a warm-weather annual that flower more often with shortening days, prefer full sun and grow best with a long, dry hot season. Zinnias grow well in a well-drained loamy soil, rich in organic matter, with a pH 5.5-7.5.

elevation: 600-1800m



Thung Kwang Tong
Local Thai variety with a mix
of pink and white flowers.

LEGUMINOUS TREES พืชตระกูลถั่ว

<i>Flemingia macrophylla</i> , Flemingia, มะแ衛ซึ่นก	23
<i>Indigofera zollingeriana</i> syn. <i>L. teysmannii</i> , Large Indigo, ครามใหญ่	23
<i>Leucaena diversifolia</i> , Red Leucaena, กระถินแดง	23
<i>Leucaena leucocephala</i> , White Leucaena, กระถินขาว	24
<i>Senna siamea</i> , Cassod Tree, ซีสแล็กบ้าน	24
<i>Sesbania grandiflora</i> , Hummingbird Tree, ดอกแฉะขาว	24
<i>Tephrosia candida</i> , White Hoary Pea, ครามป่า	25



Flemingia macrophylla

Flemingia

ມະແຍະໝົ່ນກ

Varieties: UHDP

elevation: up to 2000m

Flemingia is a perennial, deep-rooting, leafy shrub with a native range extending from China to Indonesia. It is used in contour hedgerows for erosion control, as green manure in alley cropping systems, as a candidate for agroforestry systems (shading other crops such as coffee or cocoa), as a weed suppressor, as fuelwood and as mulch. It is suitable as a forage, but it has high tannin content. Immature Flemingia leaves can be mixed with other grasses as a feed for ruminants and may be particularly useful consumed in the dry season. To plant, seeds can be scarified or boiled to improve germination, followed by soaking in cool water for twelve hours. Seedlings will emerge in 7-14 days. Plant spacing depends on purpose; but, in alley cropping, rows can be spaced approximately 90 cm apart, with seedlings every 10-20 cm. It is important to weed young plants during the first few months. Once established, it is a strong perennial plant that produces a lot of leaf growth and can grow to be 3 m tall. Flemingia can become a weed in some areas and should be monitored closely. It will produce seeds 6-7 months after planting and thus should be coppiced; cutting is recommended at 35-100 cm in height. Adapted to somewhat poor and acidic soils, Flemingia is not easily affected by pests or diseases.



UHDP

A local variety promoted for its ability to prevent soil erosion in sloping agriculture systems.

Indigofera zollingeriana syn. L. teysmannii

Large Indigo

គ្រាមីអូរូ

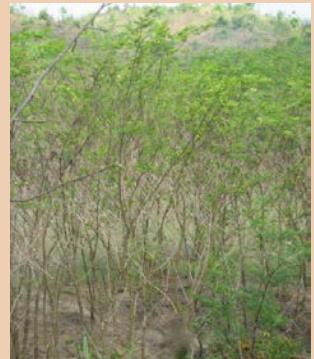
Varieties: Philippines

elevation: up to 850m

Large Indigo is an erect shrub which can grow into a small tree between 3-5 meters tall within 2 years. It has been observed up to 12 m in height. Its branches and leaves have white hairs. The leaf is 20 cm long and composed of 11-17 leaflets. The fruit is a legume with pods 35-45 mm long and indehiscent (do not split open), each containing about 10 round, flat seeds stacked like a roll of coins in the pod. In Asia, Large Indigo is grown for forage production for goats, soil conservation hedgerows, firewood production, and as an overstory tree (shade) for agroforestry projects. It can also be used to suppress Imperata grass. Large Indigo grows best in tropical/subtropical and humid/subhumid climates. It is a pioneer species which often invades open areas or fields after burning. It needs full sun, tolerates acid soil, and can grow on poor soils.

Philippines

Medium-sized
nitrogen-fixing
tree.



Leucaena diversifolia

Red Leucaena

ករោតិនណែន

Varieties: UHDP

elevation: 700-2500m

The pods, seeds, and shoots of Red Leucaena are used for food. In Thailand, young shoots are eaten fresh as a dipping vegetable, cooked in soups, or fried with eggs. In Indonesia, fermented seeds are used to make a food called "tempeh lamtoro". Green, unripe seeds are eaten as well. The green pods and high-protein leaves are a source of livestock fodder. Good for alley cropping and intercropping (especially as it offers filtered shade for other crops), Red Leucaena also has timber and firewood potential because it coppices well. Its forage quality is reportedly lower than White Leucaena, but it is better adapted to higher elevations and cooler temperatures. Red Leucaena has been promoted by the Mindanao Baptist Rural Life Center for its tolerance of acidic soil and as a psyllid resistant alternative to White Leucaena. The tree flowers year-round in Northern Thailand.



UHDP

Reddish brown pods when mature. From the UHDP Center in Northern Thailand.

Leucaena leucocephala

White Leucaena

ករោគិនខ្មោះ

Varieties: K-500 Cunningham

Similar to Red Leucaena, the pods, seeds, and shoots of White Leucaena are used for food. The green pods and high-protein leaves are a source of livestock fodder. Dried leaves can be processed as pellets for livestock and poultry. White Leucaena is one of the highest quality and most palatable fodder trees of the tropics, often described as the 'alfalfa of the tropics'. It also serves well as an alley crop and windbreak. White Leucaena grows well with annual rainfall of 600-2000 mm. It does well in soils with a pH of 5.5-8.0; however, it is intolerant of highly acid soils, low phosphorus, high salinity, high aluminum saturation, and waterlogging.

elevation: 0-800m



K-500 Cunningham

An excellent forage variety developed in Australia. A cross between Salvador and Peru-type cultivars.

Senna siamea

Cassod Tree

ម៉ីអេតីកប៊ាណ៍

Varieties: Local Thai

An evergreen, leguminous tree with compound leaves, the Cassod Tree grows between 15 and 20 m in height. Unlike many leguminous trees, it does not fix nitrogen. In Southeast Asia, its hard wood is especially useful as fuelwood, but it is also used in construction and furniture making, in windbreaks, or as a shade tree. It has also been employed in alley cropping and intercropping systems. Young leaves, flowers and tender pods are edible. The taste is bitter, thus the plant parts are boiled 1-3 times (water discarded) before being added to soups and curries or with chili paste to reduce bitterness. Traditionally, Cassod leaf curries were reportedly used as a mild laxative. The tree grows best in well-drained, fertile soils; it is intolerant of saline soils. It prefers sun or light shade.

elevation: up to 1300m



Local Thai

Fast growing. Strong wood producer. Does not fix nitrogen.

Sesbania grandiflora

Hummingbird Tree

ទុកដេកខ្មោះ

Varieties: Local Thai

The Hummingbird Tree is a nitrogen-fixing tree that grows to 5 m tall with compound leaves and large flowers. It is used for fodder and as a green manure. It is also planted as a partial shade tree, as support for climbing crops, and in windbreaks. The flowers can be eaten raw, in curries, or steamed as a side dish. Young leaves and pods are also occasionally consumed by humans. It is best to plant seedlings in moist, but well-drained, soil. It will survive some flooding and will tolerate poor, acidic, or saline soils. It grows well in full sun and partial shade, but is sensitive to long periods of cool temperatures or frost.

elevation: up to 1500m



Local Thai

White flower.

Tephrosia candida
White Hoary Pea

គ្រាមពា

Varieties: Burmese

A leguminous, perennial shrub with a dense leaf canopy, the leaves of White Hoary Pea are high in protein and can be used as a food supplement for pigs and cattle, but are not eaten by humans. White Hoary Pea is used for improved fallows and soil conservation, as well as the creation of insecticides. It prefers a mean annual temperature range of 18-28°C and a mean annual rainfall between 700-2,500 mm. White Hoary Pea grows on a wide range of soils including very poor soils. It tolerates a pH of 3.5-7; more acidic soils seem to be most suitable. However, it does not tolerate waterlogged soils.

elevation: up to 1600m



Burmese

Can be planted to provide ground cover and erosion control between perennial crops. Suitable for rehabilitating degraded land.

OIL SEEDS พืชตระกูลน้ำมัน

<i>Guizotia abyssinica</i>, Niger Seed, งาญี่ปุ่น	27
<i>Helianthus annuus</i>, Sunflower, ดอกทานตะวัน	27
<i>Plukenetia volubilis</i>, Inca Nut, ถั่ดาวอินคา	27
<i>Sesamum indicum</i>, Sesame, งาขาว/งาดำ	28



Guizotia abyssinica

Niger Seed

ကရာ၏ပြန်

Varieties: Burmese

A member of the Asteraceae family, Niger Seed is an oilseed crop with culinary, livestock production, and soil improvement uses. Seeds contain about 40% oil and 20% protein. Seed cake is used for livestock feed. Along the Thai-Burma border, Niger Seed is sown into harvested hill fields near the end of rainy season. With a recommended planting distance of 20-30 cm, it is best planted during the period of decreasing day-length in the higher latitudes of the tropics and subtropics as a short day-length is required for flowering. Niger Seed grows well at soil pH values between 5.2 and 7.3 and on almost any soil that is not extremely heavy.

elevation: 1600-2200m



Burmese

Drought tolerant once established. Ready for harvest approximately three months after planting.

Helianthus annuus

Sunflower

ဓុកទានពេវណ៍

Varieties: Black Seed, Chiang Dao

Sunflowers are upright annuals that vary in height from 1-4 m. Seeds can be roasted and eaten whole, or pressed for oil. In small-farming and backyard garden settings, Sunflowers can be a good choice for intercropping (taking note of spacing and species). Sunflowers can also be planted along plot borders to attract pollinating insects. Grown principally in temperate regions, they can tolerate subtropical and tropical climates. Subtropical varieties can withstand temperatures of -6°C to -10°C, but the plant is sensitive to frost at all stages of growth. Sunflowers will succeed in most soil types, though well-drained soils are important, as they are intolerant of waterlogged soils. They will tolerate both drought and very acidic soils (4.5-8.7 pH).

elevation: 40-2500m



Chiang Dao

Local variety averaging 2.5 m in height. Flowers are ~15 cm across. Petals are yellow in color. Seeds have a striped pattern. Kernels are quite tasty.

Black Seed

Local Northern Thai variety with black kernels. Can grow between 2-3 m in height.

Plukenetia volubilis

Inca Nut

កំគារអិនកា

Varieties: Lao

Inca Nut is a woody vining perennial in the Euphorbiaceae family native to the high altitude rainforests of the Andes in South America. It has been grown for centuries for its large seed and seed oil, which is used in cooking. Seeds are dark brown ovals, and 1.5-2 cm in diameter. Raw seeds are inedible, but roasting after shelling makes them very palatable. The viscous oil is yellow to orange in color and used for cooking. With adequate water and temperature, Inca Nuts will produce multiple times per year. Growth and fruit set are reduced in the dry, cool season if no irrigation is provided. Found at temperatures between 10-36°C, it prefers consistent rainfall and full sun and is adapted to a variety of soil types including acidic soils.

elevation: up to 1700m



Lao

Fruits are 3 to 5 cm in diameter with 4 to 5 points. Green pods ripen to blackish brown.

Sesamum indicum Sesame

ເງົາ/ກາດໍາ

Varieties: AVRDC Black, Kasetsart, Lao

Sesame is an annual plant with seeds high in oil content. Its seeds, which contain approximately 50% oil and 25% protein, are usually roasted or stewed. They can also be ground into flour, added to breads, prepared with vegetables, used to make sweetmeats, or crushed and used as a butter. The seeds can also be sprouted and used in salads. Sesame oil is used in cooking, salad oils, and margarine. Young leaves are used as a soup vegetable in sub-Saharan Africa. Sesame grows mainly in the tropics and subtropics. High temperatures are required for optimal growth and production as plants grow up to 50-100 cm tall. Sesame is very drought-tolerant, with a minimum annual rainfall of 510-660 mm necessary for reasonable yields. It is intolerant of water-logging and thrives on moderately fertile, well-drained soils with pH ranging from 5.5-8.0. Most cultivars are sensitive to salinity.

elevation: 0-1500m



Lao

Small seed and small fruit.

Caution required when harvesting, as pods tend to split open and release seeds.



AVRDC Black

Longer fruit and darker green pod than Lao variety with high yield. Black seeds.

Kasetsart

Big seed and fruit. Resistant to disease. Pods do not split before harvest.

PULSES & GREEN MANURE/COVER CROPS พืชคลุมดิน/พืชปุ่ยสัด

<i>Cajanus cajan</i>, Pigeon Pea, กั่งมะ喈ะ	30
<i>Canavalia ensiformis</i>, Jack Bean, กั่วพร้า	30
<i>Canavalia gladiata</i>, Sword Bean, กั่วดาบ	30
<i>Cicer arietinum</i>, Chickpea, กั่วหัวช้าง	31
<i>Crotalaria juncea</i>, Sunn Hemp, ปอเทือง	31
<i>Crotalaria ochroleuca</i>, Crotalaria, ปอเทือง	31
<i>Fagopyrum esculentum</i>, Buckwheat, บักวีด	32
<i>Glycine max</i>, Soybean, กั่วเหลือง	32
<i>Gossypium hirsutum</i>, Cotton, ฝ้าย	32
<i>Lablab purpureus</i>, Field Lablab, กั่วแปบบี	33
<i>Macrotyloma uniflorum</i>, Horse Gram, กั่วเขี้ม้า	33
<i>Mucuna pruriens</i>, Velvet Bean, หมามุย	33
<i>Pennisetum glaucum</i>, Pearl Millet, หญ้าไช่มูก	34
<i>Phaseolus acutifolius</i>, Tepary Bean, กั่วเทเปารี	34
<i>Phaseolus vulgaris</i>, Cranberry Bean, กั่วแครนเบอร์รี	34
<i>Stylosanthes capitata</i>, Stylo, กั่วสైໂල	35
<i>Vigna angularis</i>, Adzuki Bean, กั่วอะซูกิ	35
<i>Vigna radiata</i>, Mung Bean, กั่วเชีย	35
<i>Vigna umbellata</i>, Rice Bean, กั่วแป๊	36
<i>Vigna unguiculata</i>, Cowpea, กั่วคำ	36



Cajanus cajan

Pigeon Pea

ถั่วมะแพร់

Varieties: Pa-O Green, Pa-O Small, Thailand Mix

elevation: up to 1000m

Pigeon Pea is a short-lived perennial which may live up to 5 years. The tree-like shrub grows between 1-3 m tall and is used for food and fodder, as well as in agroforestry systems. Pigeon Pea can be eaten as dried peas, green vegetable peas, or ground as flour. Seeds are high in protein (~21%). The plant produces a deep root system and fixes nitrogen up to 168-280 kg/ha. It can be planted as an annual and is grown in the tropics and subtropics between 30°N and 30°S latitudes. Optimum average temperatures range from 18-29°C, but it does not tolerate frost. Pigeon Pea grows best where annual rainfall ranges from 500-1500 mm a year. Generally considered drought-resistant, it can be grown on a wide range of soil types. Drained soils of intermediate water-holding capacity with a pH between 5.0-7.0 are favorable. Waterlogging is harmful.

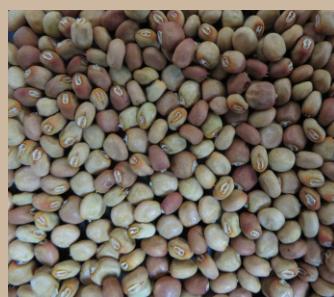
Thailand Mix

Local Thai variety with good flavor.



Pa-O Green (Above)

Immature seeds are green with brown specks. Once dried, seeds are grey with brown specks.



Pa-O Small (L)

From Shan State, Myanmar. Leaves, pods, and seeds are edible. Small seeds.



Canavalia ensiformis

Jack Bean

ถั่วพร้าว

Varieties: Chiang Dao, ECHO

elevation: up to 1800m



Jack Bean produces large leaves and smooth pods, which are edible when tender, as well as large, smooth, white seeds. However, the seeds are toxic and require special preparation in order to be consumed. The plant can be used as fodder for ruminants. An excellent green manure/cover crop, especially in alley-cropping usage, Jack Bean produces considerable amounts of biomass (29.4 kg/ha fresh weight) and fixes nitrogen up to 230 kg/ha. Jack Bean grows well at temperatures of 14-27°C and is found in the warmer parts of the temperate zone to hot, tropical rainforest areas. It can thrive with rainfall as high as 4200 mm and as low as 700 mm.

Chiang Dao

Local Thai variety with bushy growth. Matures in 120 days.

ECHO

A more aggressive climber than the local variety.

Canavalia gladiata

Sword Bean

ถั่วด้าบ

Varieties: Mae Jo

elevation: up to 1000m



Sword Bean is a drought-tolerant legume known for its extremely large seed pods (25-36 cm long) and large red or pink smooth seeds (4 cm long). It is typically grown as a green manure/cover crop. Immature pods are sliced cross-wise before being prepared in stir fry dishes and curries. Sword Bean seeds are somewhat toxic; however, the large, but not fully mature, seeds from green pods can be prepared for consumption by boiling for 10 minutes and peeling. Preferred environmental conditions are found in the humid lowland tropics with temperatures of 15-30°C, but the plants may be grown with success in tropical elevations of up to 1000 m. Sword Bean will grow in areas experiencing annual rainfall anywhere between 700-4200 mm. Optimum growth occurs in full sunlight, but the plant is tolerant of some shade.



Mae Jo

Local Thai variety with large, pink seeds. Matures in about 180 days.

Cicer arietinum

Chickpea

កំហាត់ខ្មោះ

Varieties: Burma Red, Burma Round

elevation: up to 1200m

One of the oldest cultivated legumes recorded, Chickpea is the second most important pulse crop in the world. The immature green pods and tender shoots are used as vegetables and the mature seeds are prepared as dahl or flour. Chickpea is a key ingredient in well-known Asian and Middle-Eastern foods including hummus, falafel, and Burmese tofu. It can be fermented into tempeh and dried seeds can be ground and used as a coffee substitute. A strong acid dew forms on the plant overnight that can be made into vinegar or cooling drinks. Dried seeds are about 60% carbohydrate and 23% protein. A small bushy plant 20-50 cm in height, Chickpeas are grown in tropical, subtropical, and temperate climates, but produce better in tropical or subtropical climates with 400 mm or more of rain annually. Too much water will cause plant roots and stems to rot; however, the plant will need irrigation when dry. Varieties vary in production time from 45-75 days from seed to flower.



Burma Round

Produces large, round, smooth, light brown seed (Kabuli type). Approximately 4.5 months to first harvest.

Burma Red

Produces small, rough-coated, red-brown seed (Desi type). Approximately 3.5 months to first harvest.

Crotalaria juncea

Sunn Hemp

កែវិេស

Varieties: Chiang Mai

elevation: 0-1500m

Sunn Hemp is an annual legume with stems that grow to a height of 1 m or more. It produces bright yellow, edible flowers and plump, velvety pods. It can serve as animal fodder; however, it contains toxins and should not form more than 10% of a cow's diet and should not be fed to horses and pigs. Fiber from the bark is used to make rope, canvas, fishing nets, pulp, and paper. It is commonly used as a green manure/cover crop. The plant performs well any time of year if moisture is adequate. It may suppress nematodes and shows some drought resistance. Although adapted to hot climates, it will endure slight frost. Sunn Hemp prefers full sun and performs well in almost any soil that is not waterlogged. It grows vigorously in well-drained soils with a pH of 5.0-7.5, and thrives even on poor soils with little or no nitrogen fertilizer. If grown as a fiber crop, Sunn Hemp should be sown in light, loamy soil as it will produce coarse fiber with low yields if grown in heavy clay.



Chiang Mai

A prolific local variety. Grows up to 2 m. Primarily used as a green manure/cover crop.

Crotalaria ochroleuca

Crotalaria

កែវិេស

Varieties: CASC Cambodia

elevation: 300-2000m

Crotalaria is an erect, branched annual or short-lived perennial herb growing up to 2.5 m tall. Grown as a leafy vegetable in several African countries where the young shoots and leaves are boiled and eaten, Crotalaria can also be used as livestock fodder and as a green manure cover crop. It is known to suppress Meloidogyne root-knot nematode populations and thus can be placed in crop rotation or used as a companion crop with nematode-susceptible vegetables such as tomatoes. The leaves have been used as a treatment for yellow fever, while the oil extracted from the seeds is applied as an insect repellent. Crotalaria seed germinates in 3-4 days. However, early growth is slow and it may take about 8 weeks until the first harvest. The plant dies after about 6 months. If sown as a green manure cover crop, the young crop is incorporated in the soil. For mulch, the plants are uprooted or cut at soil level and placed between the crop rows. The yield for a once-over harvest is about 1 kg/m². A green manure crop yields about 2 kg/m² fresh organic matter.



CASC Cambodia

Small, yellow seeds. Pod is similar to that of Sunn Hemp, but larger.

Fagopyrum esculentum
Buckwheat

บัคเวด

Varieties: GMCC

Buckwheat is an important grain crop in temperate areas. It does best in cool, moist temperate regions, but will tolerate the tropics at high elevations. It doesn't flower well in heat and so does not set seed well where daytime temperatures exceed 25°C. Plant about 2.5 cm deep and 15-18 cm apart in soil with a pH of 4.4-7.5. The plant will mature in 75-90 days.

elevation: 0-1500m

GMCC

A short-season crop.
Does well on low-fertility or acidic soils, but the soil must be well drained.



Glycine max
Soybean

ถั่วเหลือง

Varieties: Local Thai

Soybean is a well known legume. It is an annual bean native to Asia domesticated over 3,000 years ago, and is grown in many different climates. Pods can be harvested as a fresh vegetable (known as "edamame" in Japan), or when pods are fully mature and dried. In dry form, Soybeans are used in a wide range of dishes throughout Asia including soups, salads, and desserts. Sprouts can also be eaten in various forms. Soybeans are used to make various food products including curd, tofu, milk, sauces, and meat and dairy substitutes. Fermented versions are used in various culinary traditions as a base and to provide greater depth of flavor. The beans are high in protein as well as oil. Soybeans can also be used as silage for forage stands. The plant has a tap root that reaches as much as 2 m in depth. Planted 2.5-4 cm deep, it can be spaced according to need, from 18-76 cm apart. Soybeans require well-drained soil, preferably sandy or medium-loam. The plant is intolerant of drought and requires a pH of 6.0 or above. It should be weeded while establishing; however, it grows vigorously and is competitive once a full canopy is established. Its nitrogen-fixing ability is from 200-617 kg/ha. Soybeans are susceptible to various diseases and pests and should be monitored closely.

elevation: 0-2000m



Local Thai

From the Ban Chan region of Northern Thailand. Produces well with small seeds.

Gossypium hirsutum
Cotton

ฝ้าย

Varieties: Lao

Cotton is pest resistant, tolerant of variable conditions such as low water, and highly productive. The plants can be pruned after harvest for new growth/production. If taken care of well, each plant can produce for 2+ yrs as a short-term perennial. The cotton gathered can be used for making thread for clothing.

elevation: best at 0-1500m, up to 2200m

Lao

Light yellow flower.



Lablab purpureus

Field Lablab

ถั่วแปะปี่

Varieties: Chiang Dao, Highworth

Lablab beans can be sprouted, soaked in water, shelled, boiled, and then smashed into a paste which is fried with spices. Dried seed can be processed to make a bean cake (tofu) or fermented to make a meat substitute (tempeh). In Thailand, Field Lablab is sold as a fried, salty snack. The crop is also grown for fodder, cover crop, and pulse production. The growing crop can be grazed by cattle, goats, pigs, and sheep. Field varieties of Lablab are drought-resistant summer annuals or short-lived perennials. The plant grows best at average daily temperatures of 18-30°C and is tolerant of high temperatures. Lablab is also quite cold tolerant and able to grow at low temperatures down to 3°C for short periods; it can also tolerate very light frosts. It is drought tolerant when established and will even grow where rainfall is less than 500 mm, but loses its leaves during prolonged dry periods. Lablab tolerates partial shade. It grows in a wide range of soils from deep sands to heavy clays with pH between 4.5-7.5, provided drainage is good. However, Lablab has low salinity tolerance.

elevation: 0-2100m



Chiang Dao

White seeds.

Highworth

Non-shattering pods with black seeds. Quick maturing; yields well.

Macrotyloma uniflorum

Horse Gram

ถั่วชี้ม้า

Varieties: Burmese

Horse Gram is a lesser-known climbing annual that can be used as a pulse for both livestock and human consumption. For animals, it can help supplement grazing or be used as a fodder crop in dry season feed. In India, particularly in the southern region, Horse Gram is consumed as whole seed or sprouts. It can be cut as a green fodder 6 weeks after sowing. It is often intercropped with annual grains or in orchards. Horse Gram is particularly valued as a pioneer plant. Seeds can be sown 1-1.5 cm deep and covered lightly or broadcast. Sowing rates range from 1-3 kg/ha in a mixed pasture, up to 45 kg/ha in pure stands. The plant is well-adapted to a wide range of well-drained soils with a pH from about 5.0-8.0 and generally tolerates low rain. It should be grown in sun and produces best in hot season. A short-day flowering plant, it will typically flower in 120-180 days. Horse Gram is relatively free of disease and pests.

elevation: 0-1500m



Burmese

Easy-to-grow variety from Myanmar. Bushy. Good producer of seed with potential as a cover crop.

Mucuna pruriens

Velvet Bean

หมาบุ้ย

Varieties: Bush, Chiang Dao, Tropical

Velvet Bean is an annual legume crop extremely valuable for intercropping in cornfields, rehabilitating depleted land, and controlling weeds. It is not recommended for human consumption due to the presence of L-dopa. The pods are often used for feeding cattle and sheep; pigs can also eat Velvet Bean as long as it is less than 25% of their total diet. It is not a suitable food for poultry. Vines can be grazed, made into hay, or mixed with corn as silage. It serves as a good green manure and is able to fix nitrogen at reported rates of 228 kg/ha. It can tolerate drought, low soil fertility, and acidic soil. It is best in soil with a pH of 4.0-7.5. It is sensitive to frost and does not grow well in cold, wet soils. It grows best at altitudes under 1500 m and thrives in areas with full sun and high rainfall.

elevation: up to 2100m



Chiang Dao (L)

Climbing variety.
Requires short days for flower and pod production. Seeds are black.

Tropical (R)

Climbing variety.
Requires short days for flower and pod production.



Bush

Doesn't climb. Seeds are white with black speckles.



Pennisetum glaucum
Pearl Millet

秈្សានិមុក

Varieties: Palawan

Pearl Millet grain is used as a flour or grain-like rice. It is used in making breads (such as roti or chapati), fermented foods, porridges, steam-cooked dishes, beverages and snacks. While Pearl Millet is a staple crop in parts of West Africa, it is less commonly consumed in Asia and is an underutilized crop with lots of potential. Small amounts are used for animal feed, most often as green fodder. In upland Thailand, it is used as a relay crop. Pearl Millet is adapted to heat and aridity. It is a short-day plant, prefers between 250-700 mm of annual rainfall, and is often found at higher altitudes. It prefers light, well-drained loam and has difficulty with waterlogging. Pearl Millet is tolerant of acidic and infertile soils. It is easy to grow and less susceptible to diseases and pest issues than other grains.

elevation: up to 2000m



Palawan

Tall prolific seed producer.
Generally resistant to disease.

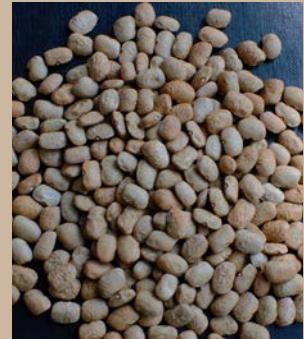
Phaseolus acutifolius
Tepary Bean

ភ័ព្យល់ពារី

Varieties: Tan/Grey

Tepary Bean is a vining or bushy annual reaching lengths of 4 m. Grown for its mature seeds, though young pods can be eaten as well, its biomass can be utilized as fresh forage for livestock, or preserved as silage or hay. A nitrogen-fixing legume, Tepary Bean can be grown as a green manure cover crop. Seeds should be broadcast at rates between 28-34 kg/ha (up to 70 kg/ha if seeded for fodder or as a green manure cover crop), or planted 2.5-10 cm deep at spacings of 10-45 cm within-row and 60-90 cm between-row. Tepary Bean is sometimes intercropped with cereals or vegetables. With deep roots, it is well adapted to dry climates and irrigation is not typically needed. Pods mature unevenly, requiring hand harvest as pods change color (2.5-3 months after planting) before shattering. Young pods and fresh seeds can be harvested earlier. Fodder can be harvested through regular pruning. Young seeds and pods can be cooked in stir-fries and soups. Mature seeds should be soaked and cooked for utilization in soups and stews, or dry seeds can be made into flour for pastries and porridges. As with most beans, adequate cooking is necessary to eliminate antinutrients.

elevation: up to 1900m



Tan/Grey

Tall prolific seed producer.
Generally resistant to disease.

Phaseolus vulgaris
Cranberry Bean

ភ័ព្យល់បេវរី

Varieties: Bhutanese Bush, Mae Ai

Cranberry Bean can be eaten by humans as either a fresh, green vegetable, or as a dried, cooked pulse. It is low in fat, high in calcium, phosphorus, and iron, and contains 22% protein. It will succeed at high altitudes with a cool growing season and prefers a well-drained, loose soil in full sun, with a pH of 5.5 to 7.0. It thrives in the tropics at elevations between 1000-3000 m when the soil temperature is over 10°C. At lower elevations, it is best to plant during the cool-dry season. Mature seeds are ready to be picked 60-65 days after planting.

elevation: 1000-3000m



Bhutanese Bush

Bush variety. Does not need a trellis. From Bhutan.



Mae Ai

Pole variety. Distinctive speckled-pink pods. Good resistance to disease. A creamy, nutty flavor.

Stylosanthes capitata
Stylo
ถั่วสైටో
Varieties: Ubon

elevation: up to 1000m



Stylo is a short-lived perennial shrub native to South America used in permanent pastures for intensive grazing. Scarification for five minutes is recommended to improve germination. Seed should be sown no more than 1 cm deep. Soil should be compacted above to increase emergence. Stylo can be grown in infertile, well-drained soils and is tolerant of low soil pH, though it will fail to nodulate in soil of pH greater than 5.5. Rainfall in its native habitat is 1500 mm per year, but it can tolerate rainfall as low as 500 mm per year. It does not tolerate flooding. Stylo prefers full sunlight and flowers in short-days. It is susceptible to forms of anthracnose disease and seed yield can also be drastically reduced by stem-borers and budworms. Stylo is self-pollinated and can be easily spread by its seed drop; it should be monitored for potential to invade and become a weed.



Ubon

From Kasetsart University's forage research station in Ubon, Thailand.

Prolific producer. Bush characteristics. Does not need trellis. Easily grown through dry season with little irrigation.

Vigna angularis
Adzuki Bean
ถั่วอะซูกิ
Varieties: Palawan

elevation: above 420m

Adzuki is a transliteration from its Japanese name; this bean is also commonly known as "Red Bean". It is an annual vine with a small bean. Grown throughout East Asia and the Himalayas, Adzuki Bean is often used in various desserts, or made into porridges or pastes. Adzuki Bean can also be eaten sprouted, boiled in a hot drink, or cooked as other dried pulses. It is nutty in flavor and a good source for a variety of minerals including magnesium, potassium, iron, and zinc. Adzuki Bean can be spaced 7-15 cm and planted about 2.5 cm in depth. It will grow to about 60-90 cm in height. It can be grown in full sun to partial shade and requires some water, preferring well-drained soil. Its flowers are yellow in color.



Palawan

From Palawan, Philippines. Bushy with red seed and green pod. Good production. Somewhat resistant to pests and disease.

Vigna radiata
Mung Bean
ถั่วเขียว
Varieties: Burmese Green, Lao, Lombok

elevation: up to 2000m

Mung Bean is an early-maturing bush, slightly vining legume which is high yielding and widely adaptable. It is used throughout Asia in desserts, ground for flour, or sprouted for use in other dishes. It has a protein content of approximately 25%. Mung Bean is cultivated most extensively in the India-Burma-Thailand region of Southeast Asia, but is also found in Iran, Pakistan, Vietnam, and China. It is a short-season crop requiring 60 to 90 days from planting to maturity. It grows mainly at temperatures within 20-40° C and up to 2000 m in the tropics. It grows well in areas with average rainfall of 600-1000 mm, but can survive with less precipitation. Generally, Mung Bean grows well on warm, sandy or otherwise loose soils, but it prefers well-drained loams or sandy loams with a soil pH range of 6.2–7.2.



Lao
Day-neutral, bush variety.
Approximately 60 days from seed to flower.
Green seed.



Burmese Green
Day-neutral, bush variety.
Green seed.



Lombok
Indonesian variety. Taller than other varieties, growing to about 1 m. Pods are larger and produce more seed.

Vigna umbellata

Rice Bean

ถั่วแป๊ะ

Varieties: Chiang Dao, Thai Department of Agriculture, ECHO, Thai Green

Rice Bean is a slender, twining, annual vine with pods approximately 10 cm long, produced in groups of 5-12. Both young pods and dry seeds are edible. Rice Bean is most often served in India as a dhal and can also be made into flour. It can also help with soil improvement and is known as a high-quality fodder. It is often relay-cropped with corn as a green manure/cover crop as it fixes nitrogen at rates of approximately 80 kg/ha. Rice Bean requires short days to flower. It is drought-tolerant and known for its wide adaptation to diverse soil conditions. It takes 5 months to maturity.

elevation: 0-1800m

Chiang Dao

Local Thai variety. Red seed.



Thai Department of Agriculture

Local Thai variety. Black seed.



ECHO

Light yellow-green seed.

Thai Green

Light yellow-green seed, slightly larger than 'ECHO' variety.

Vigna unguiculata

Cowpea

ถั่วคำ

Varieties: Chiang Dao, India Back Eyed Pea, Lahu/Mae Ai, Pa-O, Samoeng

elevation: 0-2000m

Cowpea can be eaten as a leafy vegetable and its seeds eaten green or dried. Young pods can also be eaten like green beans. In Southern India, the beans are called "thatta kaai" and are an integral part of the regional cuisine. In Tamilnadu, cooked and mashed cowpeas are combined with jiggery, ghee, and other ingredients to make cake-like sweets. Often used as a green manure/cover crop and in relay-cropping, in Northern Thailand, Cowpea is intercropped with upland rice and can be grown on very poor, acid soils as a soil improver as it fixes nitrogen at rates of approximately 80 kg/ha. It tolerates high heat, dry conditions, and can be grown with less rainfall and under more adverse conditions than *Phaseolus vulgaris* and *Phaseolus lunatus*. Cowpea yields mature green beans in 60-90 days. Harvesting of leaves can begin about 30 days after planting. It is drought tolerant when its root system is established and it thrives where soil is well drained, properly inoculated, and moderately rich with lime.



Chiang Dao

Vining cowpea less than 1 m long. Pods approximately 20 cm long. Four months to maturity.

India Black Eyed Pea

Trellising vine. Prolific seed-bearing variety. Beans are white with black spot around hilum.

Pa-O

Vining cowpea with bumpy pod. Speckled dark brown and white seeds. From Shan State, Myanmar.



Lahu/Mae Ai

Bush variety. Good resistance to disease. Grayish seed.

Samoeng

Short creeping vine, often intercropped with upland rice. Tasty plump pod. Black seed.

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Abelmoschus esculentus

Okra

ក្រោចឃឹងប៊ីយា

Varieties: Bhutanese, Clemson Spineless, Manee Maejo, Red Maroon, Star of David

Okra is an upright annual plant with plump, hairy pods. Young tender pods are eaten. Leaves are reportedly edible as well. Pods are mucilaginous (containing a slimy substance), but adding cumin, salt, and/or lime cuts mucilage. Okra can be fried with chilies or boiled. It grows best in hot climatic conditions and needs full sunlight on fertile, well-drained soils. Okra thrives on well-manured loam with a pH of 6.0-7.0.



Manee Maejo

Green and light maroon. Pod is longer than Red Maroon variety.

Red Maroon

Dark red pods can reach 20 cm, but are eaten when 12-15 cm long.

Bhutanese

Green pods 7-10 cm long. Mature pods are hairy and spiny, but young pods are edible.

Clemson Spineless

Prolific dark green, spineless pods, best when 7-10 cm long. Harvested continuously for weeks. 1-2 m in height.

Star of David

Plant is not covered with hairs. Much less slimy than other types of okra.

Amaranthus tricolor

Vegetable Amaranth

ដំឡូងម៉ែក

Varieties: Chiang Mai Red, Greenleaf, Tigerleaf

elevation: up to 2000m

Mostly a short-day crop, Vegetable Amaranth is a fast growing, short-lived annual grown for its protein-rich leaves and shoot tips. It is also high in calcium and iron. Leaves can be eaten raw but are usually cooked (boiled, stir fried, etc.). Leaf tips and young shoots are both consumed. The leaves are also often used as feed for pigs and sometimes other livestock. Vegetable Amaranth grows well in both hot-humid and hot-dry climates and can grow in a wide range of soil types and soil moisture levels. It can tolerate a range of soil pH between 4.5 and 8.0.



Tigerleaf (Above)

Leaves with green and red stripes.

Greenleaf (Above R)

Light green leaves.

Chiang Mai Red (R)

Red leaves.



Basella alba Malabar Spinach

ផែគល់

Varieties: AVRDC, Bangladesh

elevation: up to 1500m

Malabar Spinach is a perennial vining herb grown for its tender stems and leaves, which can be cooked like spinach. The leaves and shoots are mucilaginous (slimy) when cooked. Its fruits have been used for dyeing. Malabar Spinach needs night temperatures above 14°C and is best suited to humid regions. It tolerates a wide range of soil conditions but does best on slightly acidic (pH 6-6.7), humus-rich sandy loams. Trellising is recommended.



AVRDC

Smaller-leaved than Bangladesh variety and vigorous. Leaves and tender stems are eaten in salad, boiled, stewed, stir-fried, or in soups.

Bangladesh

Large-leaved, vigorous, heat tolerant variety. Long, thick vines do well sprawling on the ground, over other plants, or trained to trellises. Produces edible shoots in 70 days.

Benincasa hispida
Wax Gourd / Wintermelon
พืชเขียว
Varieties: Arunothai, Upland Mix

Wax Gourd is an annual squash-like vine, with large, soft, hairy leaves. Fruits are large, oblong, and 25-120 cm long. They are usually hairy when young, with a waxy covering when ripe. Fruit may weigh up to 40 kg, although 10 kg is normal, with solid white flesh and cucumber-like seeds. Fruit may be eaten raw or cooked and is used in soups and curries. Young leaves can be boiled and seeds roasted. The fruit may be stored for many months at room temperature. Wax Gourd can be grown year-round in tropical climates, but is usually planted at the beginning of the rainy season. It is frost sensitive and prefers a soil pH of 5.0-7.5.

elevation: up to 1000m



Arunothai

Round variety about 15 cm across.



Upland Mix

Large, green gourd about 46-61 cm long.

Brassica carinata
Ethiopian Kale
ผักกะน้ำฟรัง
Varieties: ECHO

The leaves and stem tips of Ethiopian Kale are eaten raw or cooked similarly to mustard or collard greens. Its flowering stalks are sometimes cooked like broccoli. The leaves are nutritious, high in vegetable-rich protein, vitamins A and C, and a good source of minerals. It has reportedly been used as a fodder crop species. Ethiopian Kale is propagated from seed, and seeds germinate rapidly in moist soil. Seed is often broadcast, or can be planted in rows. Plants tolerate cooler temperatures and, in Kenya, are grown at an altitude range of 0-1600 m with a rainfall range of 600-1600 mm. The plant will grow up to 1-1.6 m in height and will continue to produce new leaves, allowing the top to be frequently harvested. Ethiopian Kale is short lived, with about two months from seed to seed. It does best in sandy loam with a soil pH of 5.5-8.0.

elevation: up to 2600m



ECHO

Blue-green leaves. Grows to about 1.5 m in height.

Brassica juncea
Mustard Greens
ผักกาดเขียว
Varieties: Khasi, Mix Variety

Mustard Greens are a leafy, cool-season green, often used in salads or cooked. Seeds may also be pressed for oil. It grows best in cooler, milder temperatures (15-18°C) and can tolerate annual rainfall between 500-4200 mm and elevation up to 2000 m. It is best planted at the end of the rains, just prior to the cool season. It prefers loamy, well-drained soil and a pH of 5.5-6.8.

elevation: up to 2000m



Khasi

Extremely spicy/hot variety from Northeast India. Rounded, spiny leaves. Performs better than other varieties if planted during rainy season.



Mix Variety

Several Mustard Greens varieties originally from Northern Thailand.

Brassica oleracea var. alboglabra
Chinese Kale
ผักกะน้ำ
Varieties: Mae Tha

Chinese Kale, also called "Kailaan" or "Chinese Broccoli", has glossy, blue-green leaves with crisp, thick stems. This vegetable adapts well to both hot and cold climates and is grown year round in mild climates. After the first cutting of the main stem, the plant will grow many branches for subsequent harvests. Its white flowers, large stems, and flower buds are cooked like broccoli. It is used in stir fries and soups.

elevation: up to 1000m



Mae Tha

White flowers. Grows up to 48 cm high. Heat resistant. Will grow through the winter in most areas.

Brassica rapa var. chinensis
Pak Choi / Bok Choy

ຜັກກາງຕຸ້ງຫອງເຫຼື້ນ
Varieties: Extra Dwarf Pak Choi

Pak Choi is a cruciferous crop (cabbage family) grown for the rosette of flattened white stems topped by green leaves. This nutritious and fast-growing green leafy vegetable is popular in Asian stir fries and in other dishes calling for cooked or fresh greens. This crop prefers cooler weather and is perfect for marketing as planting-to-harvest time is around 5-6 weeks.

elevation: 500-1500m



Extra Dwarf Pak Choi

Dark green, wrinkled leaves with thick, white petioles. Picked when 6 cm tall.

Brassica rapa var. parachinensis
Choy Sum

ຜັກກາດກາງຕຸ້ງ
Varieties: Burmese, Mae Tha

Choy Sum is a cultivar of *Brassica rapa*, a species of vegetable that includes a wide range of subspecies including Turnips, Pak Choi, and Napa Cabbage. Choy Sum is a leafy green also known as "Chinese Flowering Cabbage". It is eaten widely around the world. The shoots and young leaves can be stir-fried, boiled, or steamed and contain Vitamin A, calcium, potassium, and folic acid. Its growing conditions are very similar to Mustard Greens. It can be harvested 30 to 50 days after sowing.

elevation: up to 2000m



Mae Tha

Productive, large-leaved variety from Green Net in Mae Tha, Thailand.

Burmese

Smaller leaves. From the Irrawaddy Delta region of Myanmar.

Capsicum chinense
Ghost Pepper

ພຣິກຜີບ້າ
Varieties: Mae Ai

Related to Habaneros, Ghost Pepper is known as the hottest pepper in the world. It contains capsaicin, a chemical compound that gives it hot and irritant characteristics, making it useful for natural pesticide sprays. It can also be used for flavoring dishes. Ghost Pepper prefers looser sandy or loamy soils so that its roots can receive extra oxygen. It favors hot weather, above 20°C, and long growing seasons. Plants are self-fertile, grow to be between 0.75-1.25 m high, and produce peppers 2-5 cm long. Ghost Pepper is usually transplanted at 8-10 weeks old. When harvesting and cutting up peppers, take care to use gloves and even goggles so as to avoid skin or eye irritation.

elevation: 0-1800m+



Mae Ai

Especially hot in flavor. Used for making natural pesticides.

Capsicum frutescens elevation: 0-1800m+ **Chili Pepper**

พริก

Varieties: Burmese Purple, Esaan, Hawaiian, Karen, Mae Ai Cream, Tiny Hot

Chili Peppers are eaten raw or cooked and can be dried and ground into a powder for use as flavoring. Leaves are sometimes cooked as a potherb. Pepper plants are usually grown as annuals in temperate climates, but can be perennial if there is no frost. Plant height varies with variety, but 1 m is typical. Chili Peppers require full sunlight and a long, hot season for growth. In humid areas, it is best to grow peppers during the dry season and water as needed. The plant grows best in a loam or silt loam soil with good water-holding capacity, but can grow in many soil types, as long as the soil is well-drained. It tolerates a pH of 4.3 to 8.3.



Hawaiian
Milder peppers. 4-6 cm long.



Mae Ai Cream
Hot, white peppers. 2 - 4 cm long.



Karen
Hot, red peppers. 2-4 cm long.



Burmese Purple
Hot, deep purple to magenta to red fruit. 2-4 cm long.



Tiny Hot
Very hot, very small peppers. 2-3 cm long.



Esaan
7.5 cm long. High yield, vigorous.

Clitoria ternatea **Butterfly Pea**

ดอกอัญชัญ

Varieties: Chiang Mai Mix

Butterfly Pea, a climbing vine, is used as a cover crop or green manure. While it is very drought tolerant, it does not compete well with weeds. Some weed control can be achieved by mowing the crop. Butterfly Pea flowers are used to give a blue tinge to rice and to flavour drinks; young pods are eaten like string beans. The vine can be grown with tall grasses for rotational grazing, hay, or silage. It is well adapted to a variety of soil types (pH 4.5 – 9.0), including calcareous soils, and can survive both extended rainfall and prolonged periods of drought.

elevation: up to 1800m



Chiang Mai Mix
White and blue flowers. Used for drinks and salads.

Cnidoscolus aconitifolius **Chaya**

ชา耶

Varieties: ECHO

Chaya is a fast-growing perennial shrub that produces large, dark green leaves. The leaves and thick succulent stems are a good source of protein, calcium, phosphorous, iron, vitamins A and C, niacin, riboflavin, and thiamine. Chaya is generally cooked and eaten as a potherb. Raw Chaya leaves are toxic, because they contain a cyanide-producing glucoside. However, boiling for 10 minutes inactivates the toxic compounds. The entire plant may also be ground, dried, and used as animal feed as long as it does not constitute more than 10% of their diet. Chaya is tolerant of both drought and hot, humid weather, and is moderately frost-tolerant. It does not tolerate water-logged soils and has been killed by standing water within a few days' duration. The plant tends to be highly disease and pest-resistant. Chaya tolerates a wide variety of soil conditions but does not perform well in highly acidic soils. Typically does not set seed and is propagated by cuttings.

elevation: 0-1300m



ECHO
Leaves do not have irritating hairs.

Cucumis sativus Cucumber

elevation: up to 1800m

ແຕງກາ

Varieties: Khmer, Lampang, Mae Tha

Cucumbers are grown worldwide both commercially and in home gardens. The fruit is thick, cylindrical, 6-40 cm long, and shiny green. It is eaten raw, pickled, or cooked in soups, stews, and stir-fry dishes. The young leaves and stems of Cucumber may be cooked as a green vegetable. Cucumber seeds are sometimes consumed as a diuretic. The plant performs best in loose, well-drained soils amended with organic matter, with a pH of 4.5-8.7. Hot, dry weather is ideal. Irrigation is encouraged, as water stress may cause bitter fruit. Daytime temperatures no lower than 15° C, humidity of 80-90%, and rainfall of 100-200 mm per month produce the best results. Cucumbers are not suited to high mountain climates or very dry seasons.



Khmer
Large fruit about 30 cm long.
Approximately 30 days from seed to flower. From Cambodia.



Mae Tha
Large fruit about 30 cm long.
Approximately 30 days from seed to flower. Good pickling variety.



Lampang
Light green fruit over 20 cm in length. Often planted with highland rice.

Daucus carota Carrot

elevation: above 500m

කරວත

Varieties: Pyin Oo Lwin, Uberlandia

Carrots are a biennial herb with a swollen taproot that can be up to 25 cm long. This is generally a temperate, or high altitude tropical crop, but some varieties do well in the lower tropics. Carrots are a good source of vitamin A from the orange-colored carotene pigments contained in the carrot root. In Java, the leaves are also sometimes eaten. Both tops and roots can be used for small animal and livestock fodder. Seeds should be sown in well-drained sandy soil and will prefer 310-410 mm of rainfall. Seeds can be sown directly into shallow trenches 1 cm deep, about 2.5 cm apart and will germinate in approximately 7-10 days. Seedlings should be thinned to about 8-10 cm apart and will take 60-70 days to reach maturity. Large carrots can be harvested first to prolong the season. However, carrots may suffer from nematode, wireworms, or larvae of click beetle infestations and should be rotated with non-root crops. Aphids and mites may affect the tops.



Pyin Oo Lwin
Bigger root than Uberlandia with more bushy flowery stem. Less pests.



Uberlandia
Tropical variety from ECHO Florida.

Glebionis coronaria Edible Chrysanthemum

ເບີມາສກິນໄດ້

Varieties: Thung Kwang Tong

Edible Chrysanthemum, also known as "Shungiku" or "Garland Chrysanthemum", is a leafy, annual herb that reaches a height of 90-120 cm. Its flowers have a yellow center made up of many small flowers (florets) surrounded by yellow or half-yellow/half-white petals. In warm tropical areas, sow seeds during the coolest time of year, as high heat can cause the plants to flower before producing many leaves. Supply fertility inputs as needed, as it does not thrive in poor soil. Cut the plants back to encourage leaf production. Harvest at 4-8 weeks for eating. Young leaves are the best tasting and rich in Vitamin B1; mature leaves may be bitter. Leaves are eaten fresh or cooked like other leafy herbs. The leaves turn bitter if cooked at high temperatures. Fresh or dried flowers can be boiled to make tea. The petals can also be pickled, known as "kikumi" in Japan. **Caution:** Pyrethrum, a plant based insecticide, is made from the dried flowers of Chrysanthemum cinerariaefolium or Chrysanthemum coccineum. Avoid planting these types of mums in an edible garden.

elevation: 0-1000m



Thung Kwang Tong
Edible leaves with a pungent smell. Good for companion planting.

Hibiscus sabdariffa **Roselle**

กระเจี๊ยบแดง

Varieties: Bhutanese, Burmese, Royal Project

Roselle is an annual plant with a tangy-flavored calyx used in drinks, sauces, or eaten fresh. The calyx is the fleshy structure left after the flower has faded. The leaves are edible and eaten raw or cooked. They contain 2-3% protein and traces of calcium, phosphorus, and iron. Roselle seeds can be pressed as a source of cooking oil and the plant also has a number of reported medicinal uses. Roselle does not flower until days shorten. It can be grown in temperate regions for leaf production, but most likely will not flower and produce the fleshy calyx before the plant is killed back from low temperatures. It is most suitable for tropical climates with well-distributed annual rainfall of 1500–2000 mm. Roselle grows best in permeable soil, a friable sandy loam with humus being preferable; however, it will adapt to a variety of soils.

elevation: 0-600m



Bhutanese
Big fruits, dark
edible leaves,
and thick
calyces. Good
for making
drinks.

Burmese
Hardy, red-stemmed
Roselle producing
many calyces. 90
days from seed to
flower. Edible leaf
shoots.



**Royal
Project**
Similar
appearance to
Bhutanese, but
longer fruit and
stalk.

Ipomoea alba **Moonflower**

ดอกชมจันทร์

Varieties: Chiang Mai

Often called Moonflower or "Moon Vine", *Ipomoea alba* is only one of many different plants sharing the same common name. It is a species of Morning Glory native to the Americas but naturalized throughout the world. A perennial long-stemmed woody vine, Moonflower produces fragrant white or pink flowers 8-14 cm in diameter. The flowers open in the evening and remain open until morning sunrise. Flowers that have not previously opened are broken at the stem and eaten cooked or fried and are said to help in digestion and with other stomach ailments. Flowers that have opened on previous nights are edible but not commonly eaten. Moonflower grows vigorously and in some places can be invasive. It prefers full sun.

elevation: up to 600m



Chiang Mai

Local Thai variety that produces hundreds of
large white flowers.

Lablab purpureus **Vegetable Lablab** ถั่วแบบ

Varieties: Chiang Dao

Vegetable Lablab is a climbing, semi-perennial legume grown for its edible purple pods, leaves, and flowers. Young and old bean seeds are consumed once cooked (raw dry seed is reportedly poisonous). Usually planted during the rainy season, in Thailand, Lablab begins flowering indeterminately in November and green pods are harvested from December to March. The plant is remarkably adaptable, growing in various climates and regions with annual rainfall ranging from 200 to 2500 mm and elevations ranging from sea level to 2100 m. Vegetable Lablab can be grown in many types of soils with a pH of 4.4 to 7.8. Ideal temperatures for production range from 22-35°C. The plant can tolerate partial shade.

elevation: 0-2100m



Chiang Dao

Purple pods with black seed.

Lactuca sativa

Lettuce

ผักสลัด

Varieties: Celuce, Green Bowl MJ3, Mini Cos MJ53, Red Bowl MJ4, Red Oak

Lettuce thrives under cool, moist conditions and can survive a light frost. Long, hot days generally prompt plants to bolt (send up a flower stalk) and, at this point, the sap in the leaves turns unpalatably bitter and leaf harvest ends. Heavy rains can encourage the growth of fungus and subsequent rotting. However, lettuce does need regular watering and welcomes shade from taller crops. A rich, loose soil with a pH between 6-7 is ideal. In Asia, in addition to salads, lettuce is consumed raw as a side vegetable to dip in chili sauces and curries. It is also boiled as a potherb, pickled, braised, sautéed, fried, pureed, or used in soups and stews.

elevation: above 1000m



Green Bowl MJ3

Leaves are green in color with wavy edges.

Mini Cos MJ53

Long, wide leaves. White seeds.

Red Bowl MJ4

Leaves are deep red and maroon in color with wavy edges.

Red Oak

Densely bunched, deep red leaves.

Celuce

Young leaves can be eaten as well as the hardy stem at the base of the mature plant.

Lagenaria siceraria

Calabash Gourd

น้ำเต้า

Varieties: Burmese, Cavemen's Club, ECHO Bottle Gourd, Om Koi Long

elevation: 0-2500m

Young Calabash Gourd fruit is eaten throughout Asia in the same way as pumpkin and often used in curries. The young shoots and leaves are also eaten as vegetables. The seeds, containing 45% oil, can be pressed for cooking oil. The dried gourd is also used to make cups, utensils, pipes, musical instruments, and as a flotation aid for fishing nets. Calabash Gourd can be planted year-round and is very prolific in subtropics; it tolerates heat and humidity better than most cucurbits. It grows best in well-drained, loose soil with a pH of 4.5-7.5 with a good layer of compost. Calabash Gourd should be grown on a trellis.



Burmese

Produces very large oblong fruit up to 50 cm long.



ECHO Bottle Gourd

Produces light green multi-globed fruit up to 15 cm long. Mature fruits can be made into bottles or birdhouses when dry.



Om Koi Long

Produces fruit up to 60 cm long.



Caveman's Club

From Chiang Rai, Thailand. Produces wrinkled-looking fruit with a crooked neck. Young fruit tastes similar to zucchini.

Luffa acutangula

Angled Luffa

បាបអេឡិយំ

Varieties: Burmese, Chiang Dao

elevation: up to 1800m

Angled Luffa is a climbing annual that produces oblong, fibrous fruit about 30 cm long with black seeds. Eaten throughout South, East, and Southeast Asia, it can be cooked as a vegetable or used in soups. Although Smooth Luffa is generally preferred as a sponge source, the procedure for sponge harvesting is similar for both angled and smooth types. Angled Luffa is well adapted to the warm dry tropics, but can be grown in the wet tropics as well. However, luffas are frost sensitive and do not thrive in temperate regions. It can be planted year-round, but is best planted at the beginning of the rainy season. Although the vines can be allowed to trail along the ground in dry regions, trellising is recommended to reduce fruit rot, particularly in humid areas. Angled Luffa prefers well-drained, fertile soil, although it does not require soil as fertile as other cucurbits do.



Burmese

Edible fruit, less than 30 cm long, and edible leaf shoots.

Chiang Dao

Edible fruit, 3-5 cm long. Does not become spongy.

Photo Credit: Kimberly B. Donohue

Luffa aegyptiaca

Smooth Luffa

បាបអែម

Varieties: ECHO, Thai Long, Thai Oval

elevation: up to 1800m

Smooth Luffa is a climbing annual that produces oblong, fibrous fruit about 30 cm long with black seeds. The young leaves, shoots, and fruit of luffas are eaten. Older, dry fruit are used as sponges. Luffas produce vigorous climbing vines that should be trellised. Fences or trellis supports for luffas need to be sturdy to support the weight of the fruit. Vines can be allowed to trail over the ground in the dry tropics, but trellis supports are essential to prevent fruit rot in the wet tropics. Smooth Luffa prefers fertile, well-drained soil. It is well adapted to the warm, dry tropics, but can also be grown in the wet tropics. Luffas may be planted year round, but best growth is obtained by planting at the beginning of the rainy season. Luffas are frost-sensitive, making it difficult to grow them outside tropical or subtropical climates.



ECHO

Produces smooth, plump fruit.

Thai Long

Produces smooth fruit about 30 cm long.

Thai Oval

Produces large, oval fruit.

Momordica charantia

Bitter Gourd

មេវត្ថុ

Varieties: Khmer, Local Thai

elevation: 0-500m

The immature fruit of Bitter Gourd, as well as the tender vine tips, are consumed as cooked vegetables, as the fruits are high in folic acid and vitamin C and the leaves are rich in vitamin A and calcium. Bitter Gourds are very versatile in cooking and can be boiled, fried, curried, pickled, or baked. Bitterness is reduced by soaking the peeled fruit in salt water before cooking. Tender shoots and leaves are used as greens. Bitter Gourd is a slender annual climbing to 3-3.5 m tall. The fruits are pear-shaped or oblong, growing to 10-15 cm long. Flowering is day neutral. Bitter Gourd prefers a well-drained, sandy loam soil, but will grow in areas with poorer soils. It prefers daytime temperatures between 24-27°C, as well as regular rainfall or irrigation.



Local Thai

Fruits are 23 cm long.

Khmer

Fruits are pear-shaped or oblong, grow 10-15 cm long, and turn from green to orange when ripe.

Moringa oleifera

Moringa

មេរូម

Varieties: Regional Mix

elevation: 0-2500m

Moringa is a tree with small, rounded, compound leaves, and long pods with large, winged seeds. Leaves are especially high in protein, calcium, and vitamins A, B, and C and can be eaten raw, cooked, dried or ground. The inner portion of young pods are included in curries. Roots can be used as a spicy condiment similar in taste to horseradish. Moringa grows well in poor soils and full sun, but must be established on well-drained sites; yellow leaves and dieback may indicate too much water. Moringa tolerates a soil pH of 5-9 and grows best between 25-35°C, but will tolerate up to 48°C in the shade and can survive a light frost. It is very drought tolerant.



Regional Mix

Mixture of various types native to Southeast Asia.

Oroxylum indicum Indian Trumpet Flower

ເພົາ

Varieties: UHDP

Indian Trumpet Flower grows well in warm tropical and subtropical regions with moderate rainfall. It has a tall erect trunk with large padded fruits that hang down from bare branches. The Thai and Laotian names of these vegetable pods, "Tree Tongue" or "Sky Tongue," describe the shape of these pods, which are used in traditional medicine throughout the region. Studies have shown that crude extracts of stem bark, root bark, and fruit exhibit antimicrobial, anti-inflammatory, anti-arthritis, anticancer, anti-ulcer, hepatoprotective, antidiabetic, antidiarrheal, and antioxidant properties. Large pods are eaten when young. They are bitter in taste and may be soaked first in salt water or grilled over a fire to be made more palatable. After preparation, pods can be sliced into smaller strips and either stir-fried or used in curries. To plant, germinate seeds in a nursery area. Once established, after about 3 months, transplant in a field or forested area and irrigate immediately. It is best to plant Indian Trumpet Flower in the rainy season for adequate water during establishment. The tree prefers partial shade and is great for intercropping or agroforestry systems. However, it can be susceptible to powdery mildew and may be affected by aphids or mites.

elevation: 1100-2000m



UHDP

Collected from UHDP Center's agroforestry plots.

Pachyrhizus erosus Yam Bean, Jicama

ມັນແກງ

Varieties: Laoda

Yam Bean is a leguminous plant with a bulbous tuber that may be eaten raw or cooked. Tubers are low in calories and contain less than 10% carbohydrates and slightly more than 1% protein (fresh weight). They are a good source of vitamin C. The young seed pods are sometimes cooked and eaten as a vegetable. Leaves and beans contain rotenone, a natural insecticide, and therefore should not be consumed. Yam Bean requires short days for tuber production. It produces well in hot, humid environments with a long, warm, frost-free growing season. The plant can be used as a cover crop or trellised. Yam Bean prefers well-drained soil and an optimal soil pH of 6.5-8.

elevation: up to 70m



Laoda

Vigorous growth. Perfers full sun.



Phaseolus lunatus Lima Bean

ຕ້ວງຮາມມາຈ

Varieties: Burma Red, Christmas Pole, 7-Year

The immature shoots, leaves, green-shelled beans, and pods of Lima Beans are consumed in Asia. However, raw seeds may be toxic. Dried vines may be used as animal fodder. Well-adapted to lowland tropics, especially the highly leached, infertile soils of the more humid regions, the plant prefers well-drained, well-aerated neutral soils with a pH of 6-7. Elevations for production range from sea level to 2400 meters in the tropics. Lima Beans should be planted at the beginning of the rains, as a dry period is needed for seeds to mature.



Christmas Pole

Large maroon-white mottled beans with dark red splashes. Produces approximately 90 days after planting. Heavy yields even in very hot weather. Long vines.



7-Year

Half white and pink beans.



Burma Red

Indeterminate climber. Medium-sized red beans. Produces approximately 90 days after planting.

Phaseolus vulgaris Green Bean

ถั่วเข็ง

Varieties: Bhutanese, Huay Hom, Khasi Pole, Naga Pole, Naga Speckled, Pa-O

elevation: 1000-3000m

In Northern Thailand, the immature pods of the Green Bean are eaten raw, stir fried with oyster sauce, and added to soups. The beans can also be preserved by pressure canning and freezing. Spent vines can be used as mulch or cultivated into soil, and vines and foliage may be used as fodder. Green Bean plants do well in the tropics when planted at elevations between 1000-3000 m and when soil temperature is over 10°C. The plant is best grown during the cool-dry season at lower elevations. It prefers full sun and well-drained, loose friable soils with a pH of 5.5 to 7.0.



Naga Speckled

Similar appearance to other varieties, but fruit is dark red and green and a smaller size.



Pa-O

Thick reddish pod with large white/pink spotted beans. Similar to Khasi Pole.



Bhutanese

From Bhutan. Similar appearance to other varieties, but slightly larger fruit. Prolific producer.



Huay Hom

Thin pods with white beans occurring in pairs. Similar to Naga Pole.



Naga Pole

Quick producing pole variety from Northeast India. Tender, sweet pods about 12 cm long. Brown seeds with a distinctive swirl pattern.



Khasi Pole

Quick producing pole variety from Northeast India. Pods about 12 cm long with dark brown seeds.

Pisum sativum var. macrocarpum Snow Pea

ถั่วลันเตา

Varieties: Burmese

elevation: up to 1000m+

Snow Peas produce large tasty pods with immature seeds, often consumed raw in salads, or stir fries. Vines can be used as a cover crop, either left on top as a mulch or turned in to improve soil. Snow Peas perform best in cooler weather and prefer soil that is well-drained. Plants can be direct seeded in rows about 75 cm apart, and trellised. Seeds should be sown 3-8 cm deep. In tropical locations, Snow Peas are planted in the cold season. Pods should be harvested when immature, 60 to 75 days after germination. When harvesting for seed, allow pods to fill and turn yellow and brittle.

Burmese

Strong, prolific producer of delicious pods with a soft, melting flavor.



Psophocarpus tetragonolobus **Winged Bean**

elevation: up to 1000m

ก່າວຸງ

Varieties: Bogor, Day Neutral, Pang Daeng Nawk, Purple Esaan, Purple Mae Tha

Winged Bean is a perennial legume with long, winged pods on a climbing vine. Leaves, shoots, flowers, pods and seeds are all edible. The root tuber is white and firm and about 20% protein. Young pods, harvested while still tender and bendable, can be boiled and served like green beans or used with dip sauces and curries. Protein-rich bean milk and flour are also useful dietary treatments for protein-deprived children. Winged Bean thrives in hot, wet climates, although a dry period is favorable to pollination and the production of mature pods. It can, however, be grown in the tropics at elevations up to 2100 m. It grows well under a variety of soil conditions except in sand or high salinity environments. It is drought sensitive; thus, most varieties are planted at the beginning of the rainy season with flowering induced by short day-length. Day-neutral varieties can be planted year-round.



Bogor

Short day-length variety with vigorous yields. 20 cm pods.

Day Neutral

Blooms during longer days, allowing for out-of-season production.

Pang Daeng Nawk

Short day-length variety from Northern Thailand. 30 cm, long, tender pods.

Purple Esaan

Short day-length variety. 25 cm, dark purple pods.

Purple Mae Tha

Short day-length variety. Young pod has a green-purple tip; mature pod is maroon.

Solanum benthamianum **Edible Leaf Solanum**

elevation: up to 1000m+

ມະເຂົອກິນໄບ

Varieties: Songkhla

Native to South Thailand, Edible Leaf Solanum appears similar to an Eggplant but lacks thorns and does not have the hairy leaves of most Eggplant varieties. Seeds should be germinated before planting into the field or bed. About 2 months after transplanting, the plant will begin to produce flowers. Edible Leaf Solanum thrives in all tropical seasons and will bear fruit for about 2 years. Leaves are soft and can be consumed when green or mature. Fruit is also edible, though both leaves and fruit are generally cooked before eating.



Songkhla

Edible leaf and fruit. Leaves similar in flavour to Chinese Cabbage. Fruit slightly bitter. High yield.

Solanum lycopersicum

Tomato

elevation: 0-2000m

ມະເຈື່ອເທດ

Varieties: Burmese, Columbia Yellow, Deep Red Fat Bumpy, Mae Tha, Partner, San Sai, Tommy Toe, UHDP, Yellow Pear

The Tomato is an erect or spreading and viney plant with coarse hair and small yellow flowers. Hundreds of varieties exist with fruits of different shapes, sizes, and colors. The fruits are prepared and eaten in a variety of ways and are high in lycopene, an antioxidant. The Tomato is closely related to potatoes, eggplants, and peppers. The plant can be grown at altitudes between sea level and 2000 m in the tropics, but yields are generally higher at elevations over 1000 m. A diurnal variation (daily temperature fluctuation) of at least 5-6°C is considered necessary for optimum development. High relative humidity can be harmful to tomato crops and fruits rarely ripen fully in wet weather. On the other hand, Tomato is also sensitive to sunburn and hot dry winds can lead to flower drop and reduced yields. Tomatoes can be grown on many soil types; however, sandy or sandy loam soils with a pH of 5.5 to 7.0 are preferable. The optimal soil temperature for germination is 20-30°C.



UHDP

Small, cherry variety. Grows easily on almost any soil. Many sour/sweet fruits with bumpy shape.



Yellow Pear

Yellow, sweet variety. Eaten as a fresh vegetable.



Mae Tha

Large sweet variety used for making tomato sauce.



San Sai

Round fruit. Disease resistance.



Deep Red Fat Bumpy

A little sweet. Mashed for tomato sauce or soup.



Burmese

Medium sized variety. Dark red fruit. Indeterminate.



Partner

Similar to Tommy Toe.



Columbia Yellow

Mild flavor, not sour. Tolerant and very productive.



Tommy Toe

Juicy, flavourful heirloom cherry variety. Disease resistant. Prolific. Similar to San Sai, but less yield.

Solanum melongena Eggplant

elevation: up to 900m

ມະເຈື້ອ

Varieties: Burmese Bitter, Chachoengsao, Chiang Rai Bitter, Crispy Purple, Florida Market, Mae Tha Crispy Green, Mae Tha Small White, Naga, Nakornsritamaraj, Pingtung Long, Phupan, Thung Kwang Tong, Yellow

Eggplant is an annual or semi-perennial shrubby plant. Immature fruits are used as a cooked vegetable and may be boiled, fried, stuffed or eaten with chili pastes. In Southeast Asia, unripe fruits are commonly used in curries. Productive even with nematodes, it is, however, susceptible to various soil pathogens. As a semi-perennial, Eggplant does best in well-drained soils with temperatures 28-35°C. It can be planted all year, but growth is best during the cool dry season. Eggplant will grow in soil pH of 4.3-8.5, though a pH of 5.5-7.0 is best. The optimal soil temperature for germination is 20-30°C.



Naga
Perennial, producing many large fruits year-round. Plant in cold season.



Mae Tha Crispy Green
White and green crispy fruit. Eaten raw as a vegetable in salads or with spices.



Mae Tha Small White
Small, white fruit. Strong and prolific producer. Crunchy texture.



Yellow
Edible when young and green (firm) and when mature and yellow (soft and slightly bitter). Productive in hot, humid weather.



Crispy Purple
Small, light purple fruit.



Thung Kwang Tong
Deep purple with fleshy meat. 20 cm long.



Chachoengsao
Round fruit with some stripes and a crispy texture. Harvested 45 days from transplant. Easy to grow in all tropical seasons.



Burmese Bitter
Green and red with bumpy ridges. Bitter flavor.



Pingtung Long
Purple with white stripes. 20 cm long and 3.5 cm in diameter. Disease resistant.



Phupan
Giant white fruit around 800g



Nakornsritmaraj
Dark and light purple fruit with white stripes. About 25 cm long. Few seeds located in bottom half of fruit. Productive.



Chiang Rai Bitter
Egg-shaped fruit. Green when immature; orange-red when mature.



Florida Market
Large, purple fruit, mature in 78-90 days. Resistant to *Phomopsis* blight and fruit rot.

Solanum quitoense **Naranjilla**

ມະເຈື່ອຊານ

Varieties: Burmese

Naranjilla is a thorny perennial that can reach 2.5 m in height, producing yellowish-orange fruits in a similar fashion to tomatoes. The berries have a subacid flavor and are used to make juices, jams, jellies, and flavoring for ice cream or sherbet. Naranjilla prefers short days within a long growing season, cool, moist growing conditions, and well-drained, fertile soils. It is susceptible to root knot nematodes. Its fruit is covered in bristly, sharp fuzz that can rubbed off when the fruit is ripe; wearing gloves when handling the fruit is advised. This fruit can grow at a low elevation (300-400m), but it prefers higher elevations. Naranjilla cannot tolerate frost or temperatures above 29°C and is best in soil with a pH of 6.5-7.0.

elevation: 900-2400m



Burmese

Round edible fruit 20 cm long. Sour flavor.

Solanum scabrum **African Nightshade**

ມະແວ້ງນກ

Varieties: AVRDC

The leaves of this fast-growing edible African Nightshade contain protein, iron, vitamin A, and other minerals in much higher levels than European leafy vegetables such as cabbage. Leaves, and particularly fruits, are bitter in taste; fruits are typically removed before cooking. It can also be used as animal fodder. Best grown in soil high in organic matter, African Nightshade prefers the humid tropics with at least 500 mm rainfall during the growing season and an optimal soil pH of 6-6.5. The plant grows up to 1 m high and spreads widely.

elevation: up to 2000m



AVRDC

Young shoots and leaves are blanched, boiled, stir-fried, cooked with other vegetables or added to soups. Berries are bitter and usually not eaten.

Trichosanthes anguina **Snake Gourd**

ບວບງ

Varieties: Esaan

Snake Gourd is well suited to growth in the humid lowland tropics at an optimum average growth temperature of 30-35°C. Planting typically takes place at the beginning of the rainy season. Recommended seeding is 2-3 seeds per hill in rows 1.5 m apart, with the hills widely spaced, approximately 1 m apart, to allow room for the twining vines to grow. Seedlings appear usually within 8-11 days. A horizontal bamboo trellis is a useful support for the vines and long fruits. The vines may also be allowed to grow up poles, over thatched rooftops, or over walls. The long fruits should be allowed to hang down. Weights, such as small stones, are sometimes tied to the tips of the developing fruits to make the fruits grow straight. Snake Gourd is good for making soups and stir fries. It is similar in flavor to Water Gourd.

elevation: up to 1500m



Esaan

Dark/light green fruit, 35 cm long.

Vigna unguiculata subsp. sesquipedalis
Yard Long Bean

ကားနိုက်

Varieties: Burmese, Chinese Red Noodle, Kachin, Thung Kwang Tong, Yasothon Bush

elevation: up to 1000m

A legume, Yard Long Bean is cultivated for its edible immature pods. The leaves are edible raw or cooked; fresh leaves contain 2-3% protein and traces of calcium, phosphorus, and iron. The crisp, tender pods are eaten both fresh and cooked, and are at their best when young and slender. As a West Indian dish, they are often stir-fried with potatoes and shrimp. Yard Long Bean prefers deep, fertile, well-drained loam. It can be grown on a trellis. A short-day plant, Yard Long Bean can be grown in temperate regions, but will not produce fruit.



Chinese Red Noodle
Red pod, 58 cm long.
Prolific producer.



Kachin
Green, purple-speckled
pods. Preferred for its soft
texture.



Burmese
Similar to Thung Kwang
Tong.



Thung Kwang Tong
Green pod, 40 cm long.
Soft in texture.



Yasothon Bush
Dark red pods. Bush
variety.

SEED BUNDLES ชุดเมล็ดพันธุ์

Green Manure/Cover Crop Bundle, กลุ่มพืชคลุมดิน/พืชปุยสด	55
Herb/Flower Bundle, กลุ่มสมุนไพรและดอกไม้	55
Nutrition Garden Bundle, กลุ่มพืชสารอาหารสูง	55
Salad Garden Bundle, กลุ่มสลัดสวนครัว	56
Semi Arid Bundle, กลุ่มกีงแห้งแล้ง	56
Urban Garden Bundle, กลุ่มผักสวนครัว	56



Green Manure/Cover Crop Bundle

ກລຸ່ມພື້ນຄະດີນ/ພື້ນປັ້ງສົດ

Seeds Include:

- Cowpea
- Field Lablab
- Horse Gram
- Mung Bean
- Pigeon Pea
- Rice Bean (2)
- Stylo
- Sunn Hemp
- Velvet Bean



The Green Manure/Cover Crop Bundle is a selection of 10 of the most vigorous and effective leguminous, nitrogen-fixing cover crop species for the Asia region. All are edible except Stylo, which is used for fodder.

Herb/Flower Bundle

ກລຸ່ມສຸມນໍາພຣະດອກໄນ້

Seeds Include:

- Cosmos
- Dill
- Holy Basil
- Marigold (2)
- Mexican Sunflower
- Sawtooth Coriander
- Sweet Basil
- Velvet Bean
- Zinnia

The Herb/Flower bundle features 10 herbs and flowers suitable for growing in Asia. These plants are used for companion planting and in Integrated Pest Management systems.



Nutrition Garden Bundle

ກລຸ່ມພື້ນສາຮອາຫາຮຽງ

Seeds Include:

- Chia
- Cranberry Bean
- Eggplant
- Ethiopian Kale
- Quinoa
- Sesame (2)
- Tomato
- Vegetable Amaranth
- Winged Bean

The Nutrition Garden Bundle includes a selection of 10 highly nutritious crops appropriate for small-scale gardening in Asia, with a focus on nutrition and perennial greens.



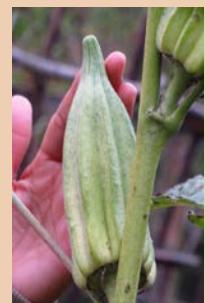
Salad Garden Bundle

กลุ่มสลัดสวนครัว

Seeds Included:

- Cape Gooseberry
- Carrot
- Edible Leaf Solanum
- Lettuce (2)
- Mustard Greens
- Okra
- Roselle
- Tomato
- Yard Long Bean

The Salad Garden bundle is a mix of 10 different nutritious crops appropriate for small-scale gardening in Asia, with a focus on annual vegetables.



Semi Arid Bundle

กลุ่มกึ่งแห้งแล้ง

Seeds Included:

- Chili Pepper
- Foxtail Millet
- Inca Nut
- Job's Tears
- Lima Bean
- Moonflower
- Passion Fruit
- Pearl Millet
- Sorghum
- Tepary Bean

The dry and arid tropics in Asia present many challenges for sustainable food production. The Semi-Arid bundle features 10 crops that are adapted to dry, hot climates.



Urban Garden Bundle

กลุ่มผักสวนครัว

Seeds Included:

- Chinese Kale
- Choy Sum
- Coriander/Cilantro
- Ethiopian Kale
- Holy Basil
- Lettuce (2)
- Mustard Greens
- Sweet Basil
- Tomato

The Urban Garden Bundle is a selection of 10 vegetable crops that do well in the dry season in an urban garden setting.



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