



Seed Catalog



echo
Hope Against Hunger

มูลนิธิเอคโค่ เอเชีย ประเทศไทย
ECHO Asia Thailand Foundation

Copyright ©2023 by ECHO, Inc. ®
All rights reserved

Published by ECHO Asia Impact Center, Chiang Mai, Thailand

To purchase a copy of this book or for more information contact: echoasia@echocommunity.org

Edited by Hanni Oppel
Catalog design by Andre Fonseca

For further resources, seeds, or networking opportunities, please visit our website: echocommunity.org/regions/asia

ECHO Asia Thailand Foundation
159 Moo 2, Tambon San Pa Pao, Amphur San Sai, Chiang Mai 50210 Thailand



Seeds are a strategic starting point for any agricultural development program or project, and good seeds are undoubtedly one of the most essential 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 whose risk-taking capacity is low, what matters most are yield-dependable, climate-smart, sustainable seeds. Seed security—access to enough quality seed at planting times—is paramount.

ECHO Asia has operated a seed bank in Thailand since 2009, the first seed bank outside ECHO Inc. Florida Headquarters. The goal of the ECHO Asia Seed Bank is to serve as a resource facility for agricultural and community development workers within the region who wish to experiment with and 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 acquire small sample packets for free or purchase bulk orders of selected seeds. The “ECHO Asia Seed Catalog” aids this transaction.

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 while conducting training and networking activities with partners. This ECHO Asia Seed Bank Catalog version 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 this catalog will significantly 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.

Patrick Trail
Regional Director
ECHO Asia





The ECHO Asia Seed Bank

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

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

In 2017, ECHO Asia began the move from Mae Ai to a new farm and seed bank site, just 25 minutes from the Chiang Mai office. The current location 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 to 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.

Services Offered



Producing an ECHO Asia Seed Bank catalog with more than 200 seeds and a continuously expanding seed inventory that is available for sale on ECHOcommunity.org. Our members qualify for **10 free seed sample 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 and information on upcoming events. We currently translate these articles into 7 regional languages, including Thai, Burmese, Vietnamese, Khmer, Indonesian, Mandarin and Hindi. All of these resources are available on ECHOcommunity.org.



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



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



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



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



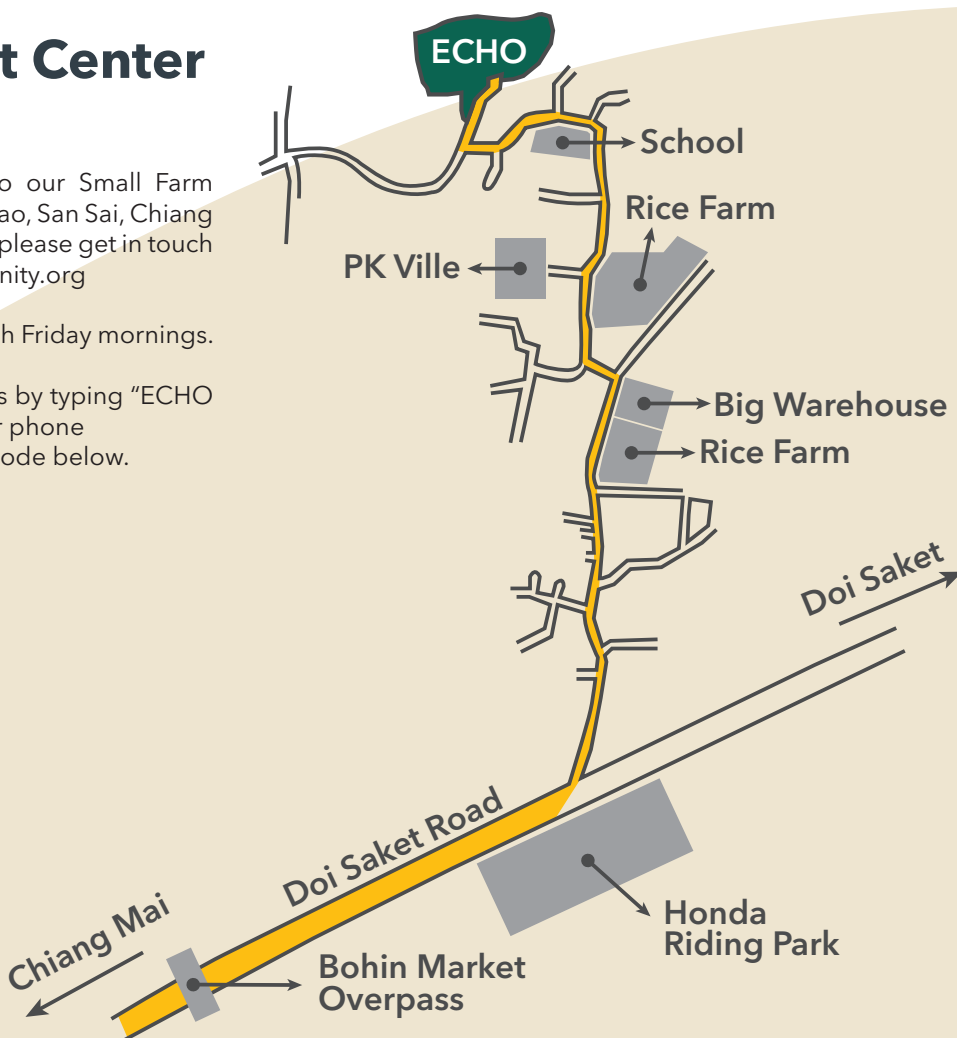
Promoting **Volunteer Opportunities & Internships** for those who wish to learn more about sustainable agriculture, seed banking, research and living cross-culturally.

Visiting the Impact Center & Seed Bank

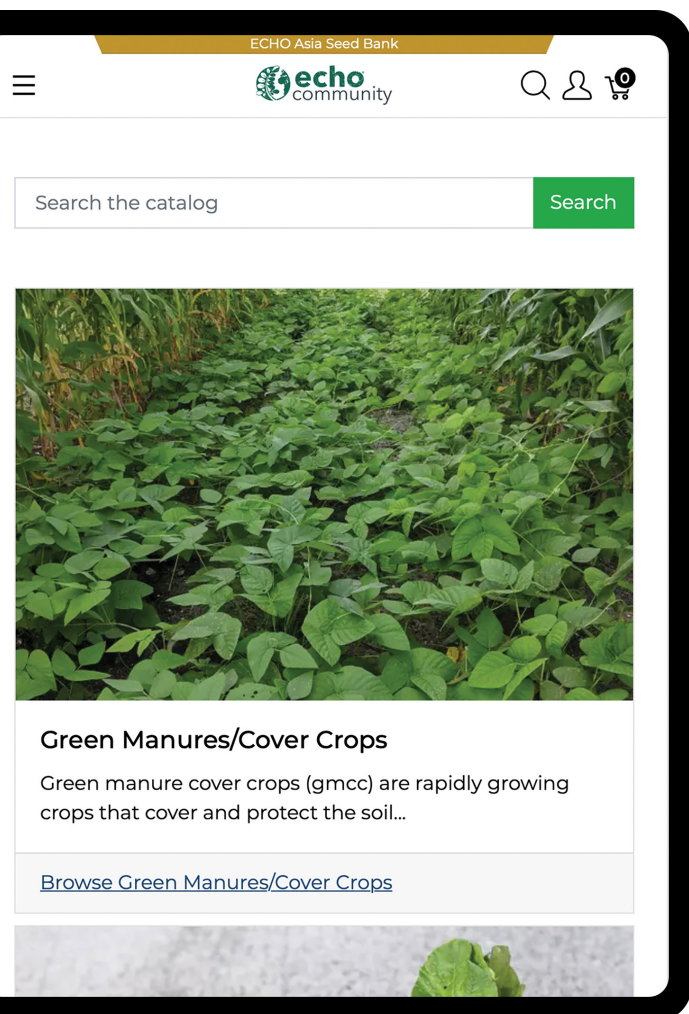
We are pleased to welcome visitors to our Small Farm Resource Center & Seed Bank in San Pa Pao, San Sai, Chiang Mai! If you are interested in taking a tour, please get in touch with us by email: echoasia@echocommunity.org

Tours are offered weekly, Tuesday through Friday mornings.

You can locate our farm on Google Maps by typing “ECHO Asia Farm & Seed Bank” or by using your phone (with the camera mode) to scan the QR code below.



Seed Ordering and Research Steps



Step #1: Order Seeds

Please register as a member of [ECHOcommunity.org](https://echocommunity.org); it is free! With this membership, you can order seeds, register for events, subscribe to publications like the quarterly ECHO Asia Notes, and much more!

Go to the **ECHO Asia Seed Bank** store on **ECHOcommunity.org**. If you are an active agriculture and community development worker, you are eligible for **10 free seed sample packets** per calendar year. Please enter the promotional code **"FreeAsiaSeeds"** at checkout. We can ship seed to most (but not all) countries in Southeast Asia. Please research your local regulations before contacting us.

If you are ordering more than 10 sample packets or if you are ordering seeds 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 sample packets of open-pollinated seed for trial. It is essential 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 adequate trial on-site can have severe consequences for your work or ministry.

Step #3: Observe

Before disseminating seeds in the broader community, it is important to conduct trials to determine the conditions and seasons of optimal performance. Likewise, it is important to watch the planting carefully during the first few seasons to ensure it does not produce too aggressively.

Throughout each planting season, 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 you must conduct elaborate experimentation, but we highly value all the information you can share 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 beyond your internet connection. You can download the app in the Apple App Store or 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.


Christmas Pole



7-Year



Burma Red



4

Phaseolus lunatus

Lima Bean

ถั่วราชมาช

1

Raw seeds may be toxic

2

Christmas Pole

Large maroon-white mottled beans with dark spots. Produces approximately 90 days after planting, even in very hot weather. Long vines.

7-Year

Half white and pink beans.

Burma Red

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

1

Latin name, common English and Thai name

2

Plant information


3

Plant varieties

4

Pictures of the plant varieties

Symbol and Color Definition

 Elevation

Fodder

Caution

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 common name.

ECHO Asia Seed Catalog 7

Fruits

Sunrise Solo



Carica papaya Papaya

มะละกอ

▲ 0-2100m. Best below 900m.

Papaya is grown throughout the tropics for its fruit. It is eaten fresh as a green and under-ripe vegetable and as a fruit once soft, and the color turns a yellowish-orange. 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 is sensitive to flooding. A shallow-rooted plant, Papaya is susceptible to wind damage. Plants are typically unisexual, 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. Moths pollinate the trees.

Sunrise Solo

Short plant. Fleshy fruit.

UHDP

Tall plant. Long fruit, sweet in flavor.

UHDP



Cambodia



Cucumis melo Muskmelon

แตงลาย

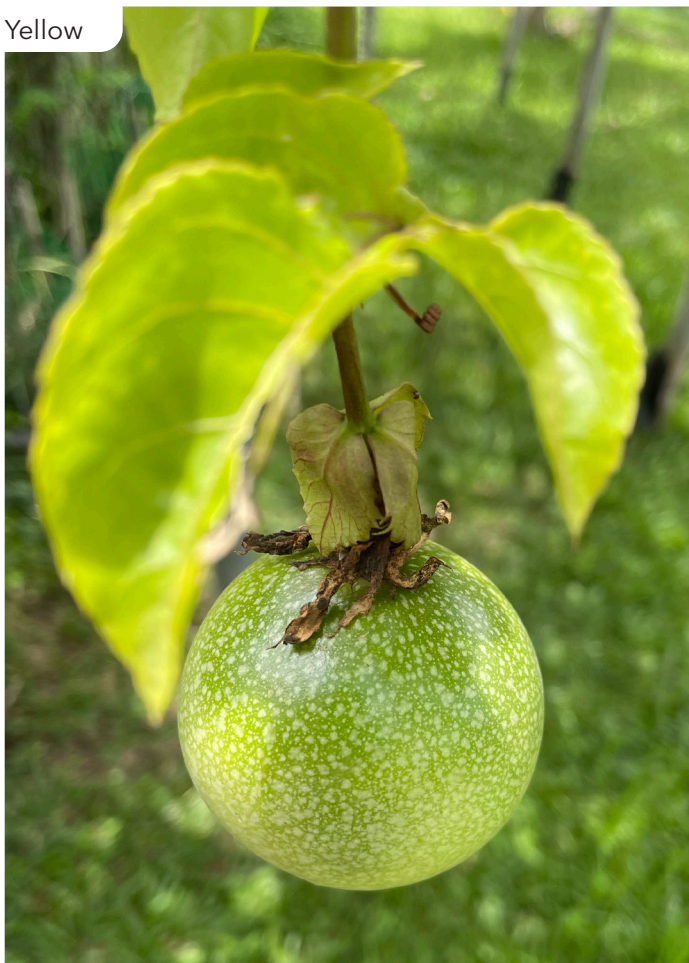
▲ 0-1000m

Muskmelon, or Cantaloupe, Mash Melon, Melo, and Pepo, is a creeping annual gourd producing round or oval fruits 10-15 cm in diameter with a rough, netted outside skin. Muskmelons were initially grown in the hot, dry savanna regions of Africa and southwest Asia. The seeds yield edible oil 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 and smoothies and eaten with chilli sauce. It is pest-resistant, so watch for excessive growth. However, it is a 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.

Cambodia

Light green, sweet flesh with many seeds.

Yellow



Passiflora edulis Passionfruit

เสาวรส

▲ 0-1300m

A woody perennial that climbs with a trellis, Passionfruit is grown for its sweet and sour seedy pulp. It is eaten fresh and used in smoothies, juices, or 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. However, it prefers sandy loam with a pH of 6.5 to 7.5. Good drainage is essential. Regular watering will keep a vine flowering and fruiting almost continuously.

Yellow

Sweet and sour flavor. Yellow when ripe.

Royal Project



Physalis peruviana Cape Gooseberry

โทงเทง

▲ 300-2400m

Unripe berries are toxic and have caused deaths and illnesses among cattle populations. Few reports, however, indicate that unripe fruits are severely harmful to humans. To err on the safe side, wait until the fruit is fully ripe before consuming.

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 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. Cape Gooseberries are high in vitamins A and C. The ripe fruits also have beta-carotene, calcium, iron, phosphorus, potassium, bioflavonoids, protein, and fiber concentrations.

Royal Project

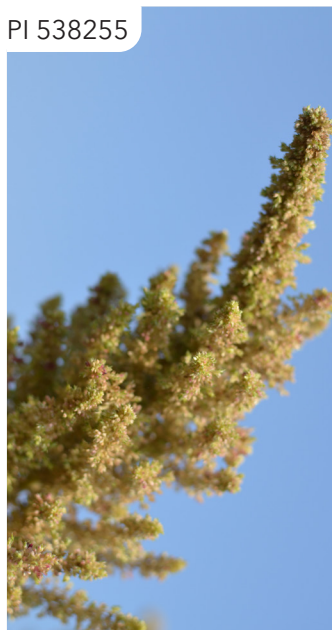
Looks and tastes like a sweet yellow-orange version of a cherry tomato. Paper-like sheath on the outside should be removed before eating.

Grains

Mexican



PI 538255



Amaranthus cruentus

Grain Amaranth

ผักโขมเมล็ด

▲ 0-1200m

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.

Mexican

White and yellow flowers, white seeds.

PI 538255

Yellow flowers, white stem.

PI 538320

Red flowers, white stem.

PI 538321

Red flowers, white seeds.

PI 606767

Light brown flowers.

PI 538321



PI 538320



PI 606767



Australia



Chenopodium quinoa Quinoa

ควินัว

▲ 0-4000m

Quinoa is a flowering plant in the Amaranth family grown primarily for its edible seeds, which are particularly rich in protein, dietary fiber, B vitamins, and dietary minerals. Quinoa is not a grass but a pseudocereal related to spinach and amaranth originating in Northwestern South America. It grows about 1-2 m high and has broad, generally powdery, hairy, lobed leaves, typically arranged alternately. The woody central stem may be green, red or purple. The seeds are about 2 mm in diameter and of various colors—white, 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 waterlogging.

Australia

Green stem. Leaves and flowers are covered with a soft, white fuzz. Tan colored seeds.

Decorative Mix



Coix lacryma-jobi Job's Tears

ลูกเต๋อย

▲ 0-2000m

Can be fed to poultry and the foliage used as fodder.

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 and parts of China. This grain can be eaten like rice, ground into flour, added to soups and snacks and fermented. Seeds of certain varieties are used as beads for decoration. Often planted at the beginning of the rainy season, it requires fertile soil for the best growth. In poor soils, many fruits are hollow. Job's Tears is reportedly best suited to latitudes between 22°N and 22°S .

Decorative Mix

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

Mekong Mix

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

Mekong Mix



Chiang Mai



Salvia hispanica

Chia

เมล็ดเชีย

▲ 400-2500m

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 is 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 digested without breaking the seed coat. Chia's widely acclaimed health benefits can be attributed to its overall high nutrient content: it is high in soluble fiber, protein (20-23%), 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 many health problems.

Chiang Mai

Multicolored white, brown and grey seeds.

Chiang Dao



Setaria italica

Foxtail Millet

ข้าวฟ่างหางกระรอก

▲ 0-1800m

Useful as fodder.

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, 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. Foxtail Millet grows about 2 m tall and requires approximately 120 days till harvest. In Thailand, Foxtail Millet is sometimes intercropped with upland rice and can be planted during the rainy season or the dry season with irrigation.

Chiang Dao

Yellow-brown seeds.

Local Thai



Pang Daeng



Sorghum bicolor

Sorghum

ข้าวฟ่าง

▲ 0-1000m

Grain is fed raw to chickens, or cooked as pig feed.

Sorghum is a 3-meter-tall minor grain crop, often intercropped with upland rice. The grain can be cooked like rice, popped like popcorn, cracked like oats for porridge, malted for beer, or baked like wheat into flatbreads. 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 six months). Sorghum prefers regions with 200-1,250 mm annual rainfall. Adapted to a wide range of soils, a pH of 5.0-8.5 is best if moderately well-drained. While it is well-adapted to areas with low rainfall, high temperatures will not produce a reliable crop.

Local Thai

From the Mae Jam and Pai regions of Northern Thailand. Seeds are black.

Pang Daeng

A local variety mostly grown for livestock feed.

PI 521344

A sweet variety with red seeds.

PI 521344



Lampang



Naga



Zea mays var. everta

Popcorn

ข้าวโพดคั่ว

▲ 0-2000m

Popcorn is similar to Flint Corn; however, this variety is well-suited for popping. It is a warm climate crop, thriving in open, sunny environments with daytime temperatures of 20-24°C. Rainfall during the growth period should be 500 mm or more, so Popcorn can be planted during the rainy season or dry season with irrigation. Plant multiple rows at a time for good pollination. Popcorn prefers well-drained soil and grows best with a pH of 6.0-7.0.

Lampang

Small, dark red kernels.

Naga

Hardy variety from Northeast India. Small ears with hard, round, yellow kernels.

Timor Island

Pearly white kernels.

Timor Island



Grains

Chiang Dao



Dark Red



Esaan



Lampang



Light Yellow



Zea mays var. indurata

Flint Corn

ข้าวโพด/ข้าวสาลี

▲ 0-2000m

Corn is an important feed source for poultry, swine, and cattle. The whole plant is used as green fodder or 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 generally characterized by mid-sized ears with multicolored kernels that grow vigorously under suitable conditions. This hardy crop has a "flinty" seed coat and is appropriate for 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 before grinding and after

fermentation and can be used to prepare dishes such as "kenkey" or "pozole." Cornstarch is used as a thickening agent. Young tassels may be boiled and eaten, and the pollen is used as a soup ingredient.

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 the dry season with irrigation. It prefers well-drained soil and grows best with a pH of 6.0-7.0.

Naga Multi-Colored



Orange



Samoeng Purple



Wachichu



White & Light Red



Chiang Dao

White kernels.

Dark Red

Wine-red kernels. Grows vigorously.

Esaan

Faded blue kernels.

Lampang

White kernels with occasional purple kernels.

Light Yellow

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

Naga Multi-Colored

From Northeast India. Mid-sized ears with multicolored kernels.

Orange

Multicolored orange and yellow kernels. Full shape. Used for fodder.

Samoeng Purple

Dark purple kernels.

Wachichu

Heirloom variety from USA with orange, light purple, or white kernels.

White & Light Red

Kernels are a range of colours: white, pale yellow, and light rose.

Grains

Esaan Yellow



Zea mays var. saccharata

Sweet Corn

ข้าวโพดหวาน

▲ 0-2000m

Sweet Corn is sweeter than other types of corn because the endosperm, before becoming ripe and dry, contains sugar and 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.

Esaan Yellow

111 days to harvest.

Silver Sweet Corn

White kernels.

Hawaiian Supersweet #9

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

Silver Sweet Corn



Hawaiian Supersweet #9



การจัดการศัตรูพืชแบบผสมผสาน

Burmese



Anethum graveolens

Dill

ผักชีลาว

▲ above 200m

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 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.

Burmese

A tall, well-branched bluish-green plant.

Calendula



Calendula officinalis

Calendula

ดาวเรืองหม้อ

▲ 900-2500m

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 are 3-7 cm across, with ray and disc florets. Calendula is widely cultivated and can be grown easily in sunny locations in most soils, though plants do best if planted in rich, well-drained soil. 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 does not thrive. 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 place of saffron. Flowers have also been used as a medicinal herb and a fabric dye. Leaves can be made into a poultice that is believed to help scratches and shallow cuts heal faster and prevent infection.

Orange Zinger

Bright orange flowers with a gradually darkening center.

Mae Ai



Capsicum chinense

Ghost Pepper

พริกผีบ้า

▲ 0-1800m

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. Ghost Pepper prefers loose, 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 between 0.75-1.25 m high, and produce 2-5 cm long peppers. Ghost Pepper is usually transplanted at 8-10 weeks old. Use gloves and goggles to avoid skin or eye irritation when harvesting and cutting peppers.

Mae Ai

Especially hot in flavor.

Herbs & Integrated Pest Management

Pyin Oo Lwin



Coriandrum sativum

Coriander/Cilantro

ผักชี

▲ 0-2200m

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 most traditionally used in cooking.

Pyin Oo Lwin

Seeds, leaves, and roots are all edible.

Sea Shell



Cosmos bipinnatus

Cosmos

ดอกปอกระเจา

▲ 1100-2100m

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, Cosmos will become leggy if soil is too rich. It prefers neutral to alkaline pH.

Sea Shell

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

Thung Kwang Tong



Cosmos sulphureus

Cosmos

ดอกปอกระเจา

▲ 1100-2100m

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.

Thung Kwang Tong

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

การจัดการศัตรูพืชแบบผสมผสาน

Local Thai



Eryngium foetidum Sawtooth Coriander

ผักชีฝรั่ง

▲ above 200m

Sawtooth Coriander is a biennial or short-lived perennial native to tropical America. It is grown mainly for its young 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 and small spines along the leaf edge. They have a similar aroma to Cilantro. The plant can be directly seeded or transplanted 10-15 cm apart in rows no closer than 15 cm. Young leaves are harvested for use as they become tough when the plant starts to flower. Flower stalks are pruned to maintain the growth of leaves. Sawtooth Coriander prefers full sun.

Local Thai

Easy to grow with a potent flavor.

Foeniculum vulgare Fennel

ผักชีล้อม

▲ above 500m

Fennel is a short-lived perennial cultivated as a flavorful, aromatic herb and a vegetable. The bulbous base of the plant, its leaves, flowers and seeds can all be eaten. The mature seed tastes similar to anise and is used as a spice. The green, immature seed is even more aromatic and is used in cooking and as a dessert flavor. The feathery leaves can be cooked in a variety of dishes in fresh or dry form. The base is sweet and aromatic and can be used for similar purposes. Fennel can also 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 plants are approximately 10 cm tall. Fennel prefers a well-drained area with sun. Plants will grow 0.5-1 m tall and produce flowers after 90 days. They will bloom better in the second year, with enough water.

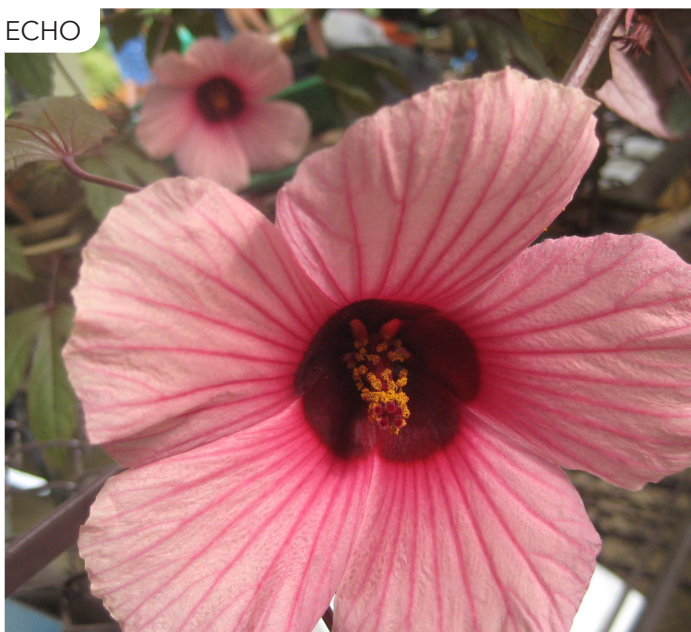
Burmese

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

Burmese



ECHO



Hibiscus acetosella Cranberry Hibiscus

ชบาเมเปิ้ล

▲ 0-900m

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 tea or lemonade. The long taproots require deep, loose, well-drained soils for maximum growth. Cranberry Hibiscus is propagated from seeds or stem cuttings. Seeds may be directly sown in springtime in well-prepared soil or transplanted as young seedlings from seedbeds to field conditions. However, Cranberry Hibiscus tends to spread quickly when self-seeding. The plants must 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.

ECHO

Originally from Africa where it grows in wet climate areas.

Herbs & Integrated Pest Management

Chiang Mai



Impatiens balsamina Rose Balsam

ดอกเทียน

▲ 1100-2100m

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. Traditionally, leaf juice is used to treat warts and snakebites, and the flower is applied to burns. Bees and other insects pollinate Rose Balsam so that it can be helpful in companion planting.

Chiang Mai

White, pink and mauve flowers.

Buriram Pink



Nicotiana tabacum Tobacco

ยาสูบ

▲ 200-1200m

Tobacco is a quick-growing, herbaceous annual. It has a thick, hairy stem and large, simple leaves up to 70 cm long. The plant does not branch and can reach 150-200 cm in height. The tubular flowers are white, cream, pink or red and grow in clusters. The plant matures in 55 days and produces capsule-shaped fruit. It grows best in fertile, well-drained soil. Tobacco is a key ingredient in natural pesticides.

Buriram Pink

Pale pink flowers.

Local Thai



Ocimum basilicum Sweet Basil

โหระพา

▲ 0-2500m

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, it can treat headaches, coughs, diarrhea, and constipation. It is used in Integrated Pest Management systems to attract and repel certain insects and make natural pesticides. It can be grown in temperatures of 7-27°C and in areas with annual rainfall between 600-4200 mm. Sweet 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 grow to about 50-60 cm tall. Leaves can be harvested at any time of year; pinching young shoots off at the beginning of the rainy season will also encourage growth.

Local Thai

Soft, dark green leaves with purple flower buds.

การจัดการศัตรูพืชแบบผสมผสาน

Local Thai



Ocimum tenuiflorum Holy Basil

กะเพรา

▲ 0-2500m

Holy Basil has similar planting, care, maintenance, and use as Sweet Basil. However, Holy Basil has different culinary uses and is primarily noted for its use in stir-fried dishes. Plant the seeds about 0.3 cm deep and 15-30 cm apart. The plant will grow about 50-60 cm in height. The growing tips and flowers should be pinched off in early spring to encourage new growth. Holy Basil will tolerate dry soil better than most herbs and can be grown as a potted indoor plant with plenty of light. 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.

Local Thai

Small leaves, blue/green in color.

Tagetes erecta African Marigold

ดอกดาวเรือง

▲ 0-2000m

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 reduce yields of beans and cabbages.

African Heirloom

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

Tagetes minuta Nematicidal Marigold

ดอกดาวเรืองไล่เดือนฝอย

▲ 0-2000m

Nematicidal Marigolds can be added anywhere in the garden and serve as a beneficial companion plant. 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 that prevents 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, and should not be over-watered. Well-drained soil is best, and the plant will tolerate both acid and alkaline soils.

Nematicidal Heirloom

Leggy plant with small white flowers. Heirloom variety from USA.

African Heirloom



Nematicidal Heirloom



Herbs & Integrated Pest Management

Red Marietta



Tagetes patula French Marigold

ดอกดาวเรืองฝรั่งเศส

▲ 0-2000m

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. French 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 reduce yields of beans and cabbages.

Red Marietta

Red flowers with yellow edged petals.

Local Thai



Tithonia rotundifolia Mexican Sunflower

ทานตะวันแม็กซิกัน

▲ 0-1500m

Mexican Sunflower is a woody 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 and is moderately resistant to drought. It can be used for fuel, compost, fodder, soil erosion control, and building materials. Its leaves and green stems can be applied as mulch or incorporated into the soil as green manure as its 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 four days and then poured onto underground termite mounds. The plant prefers well-drained, moderately fertile soil in full sun. It can reach 3 m in height and should be staked and sheltered from strong winds. It grows best in hot, sunny weather.

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.

Thung Kwang Tong



Zinnia elegans Zinna

ดอกบานชื่น

▲ 600-1800m

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 of 5.5-7.5.

Thung Kwang Tong

Mix of pink and white flowers.

UHDP



Flemingia macrophylla

Flemingia

มะแฮะขึ้นนก

▲ 0-2000m

Suitable as a forage but has a high tannin content. Immature leaves can be mixed with other grasses as a feed for ruminants and may be particularly useful in the dry season.

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. 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; in alley cropping, rows can be spaced approximately 90 cm apart, with seedlings every 10-20 cm. It is essential to weed young plants during the first few months. Once established, it is a robust perennial plant that produces a lot of leaf growth and can grow 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.

Philippines



Indigofera zollingeriana syn. L.

teysmannii

Large Indigo

ครามใหญ่

▲ 0-850m

Grown as forage for goats.

Large Indigo is an erect shrub which can grow into a small tree between 3-5 meters tall within two 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 indehiscent pods 35-45 mm long (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 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 tree.

Leguminous Trees

UHDP



Leucaena diversifolia

Red Leucaena

กระถินแดง

▲ 700-2500m

The green pods and high-protein leaves are a source of livestock fodder. However, its forage quality is reportedly lower than White Leucaena, though it is better adapted to higher elevations and cooler temperatures.

Red Leucaena pods, seeds, and shoots are edible. 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. Red Leucaena is suitable for alley cropping and intercropping (especially as it offers filtered shade for other crops). It also has timber and firewood potential because it coppices well. 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.

K-500 Cunningham



Leucaena leucocephala

White Leucaena

กระถินขาว

▲ 0-800m

One of the highest quality and most palatable fodder trees of the tropics. Green pods and high-protein leaves can be used as livestock fodder. Dried leaves can be processed as pellets for livestock and poultry.

Like Red Leucaena, the pods, seeds, and shoots of White Leucaena are used for food. It 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.

K-500 Cunningham

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

Local Thai



Senna siamea

Cassod Tree

ชีเหล็กบ้าน

▲ 0-1300m

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 hardwood 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; however, the taste is bitter. Thus, the plant parts are boiled 1-3 times (water discarded) to reduce bitterness before being added to soups, curries, or chili paste. 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.

Local Thai

Fast growing.

Local Thai



Sesbania grandiflora

Hummingbird Tree

ดอกแคขาว

▲ 0-1500m

The Hummingbird Tree is a nitrogen-fixing tree that grows 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 a 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. 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.

Local Thai

White flower.

Burmese



Tephrosia candida

White Hoary Pea

ครามป่า

▲ 0-1600m

High protein leaves can be used as a food supplement for pigs and cattle.

A leguminous, perennial shrub with a dense leaf canopy, 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 most suitable. However, it does not tolerate waterlogged soils.

Burmese

Used as ground cover and for erosion control between perennial crops. Suitable for rehabilitating degraded land.

Oil Seeds

Burmese



Guizotia abyssinica Niger Seed

งาญี่ปุ่น

▲ 1600-2200m

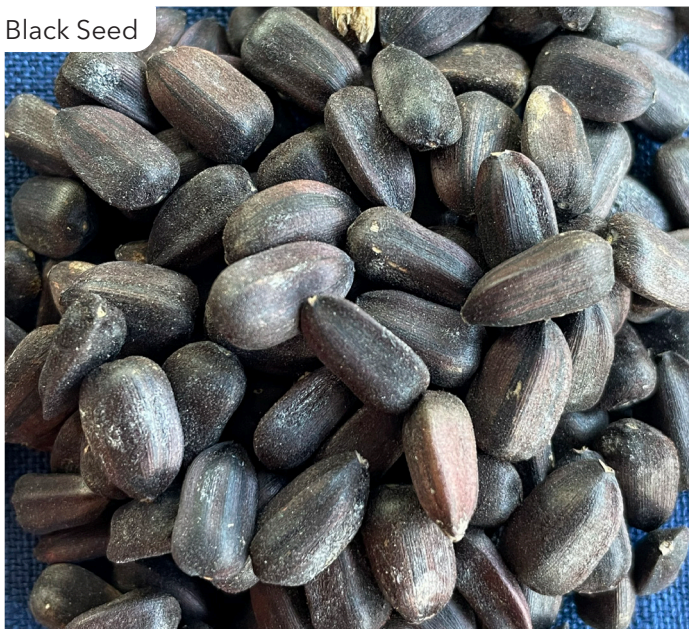
Seed cake is used for livestock feed.

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. Along the Thai-Burma border, Niger Seed is sown into harvested hill fields near the end of the rainy season. With a recommended planting distance of 20-30 cm, it is best planted during 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.

Burmese

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

Black Seed



Helianthus annuus Sunflower

ดอกทานตะวัน

▲ 40-2500m

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 essential, as they are intolerant of waterlogged soils. They will tolerate drought and very acidic soils (4.5-8.7 pH).

Black Seed

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

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.

Chiang Dao



Lao



Plukenetia volubilis

Inca Nut

ถั่วดาวอินคา

▲ 0-1700m

Inca Nut is a woody vining perennial 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. Green pods ripen to blackish brown. 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 and is used for cooking. Inca Nuts will produce multiple times per year with adequate water and temperature. 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 various soil types, including acidic soils.

Lao

Fruits are 3 to 5 cm in diameter with 4 to 5 points.

Kasetsart



Sesamum indicum

Sesame

งาขาว/งาดำ

▲ 0-1500m

Sesame is an annual plant whose seeds are approximately 50% oil and 25% protein. These seeds are usually roasted or stewed and can be ground into flour, added to bread, prepared with vegetables, used to make sweetmeats, or crushed and used as 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 waterlogging and thrives on moderately fertile, well-drained soils with pH ranging from 5.5 to 8.0. Most cultivars are sensitive to salinity.

AVRDC Black

Longer, darker green pod than Lao variety. High yield. Black seeds.

Kasetsart

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

Lao

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

Lao



AVRDC Black



Pulses & Green Manure/Cover Crops

Pa-O Green



Cajanus cajan

Pigeon Pea

ถั่วแขก

▲ 0-1000m

Used as fodder.

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 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 annually and 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 with annual rainfall ranging from 500-1500 mm. Generally considered drought-resistant, it can be grown on various soil types. Drained soils of intermediate water-holding capacity with a pH between 5.0-7.0 are favorable. Waterlogging is harmful.

Pa-O Small



Pa-O Green

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

Pa-O Small

Small seeds.

Thailand Mix

Good flavor.

Thailand Mix



พืชคลุมดิน/พืชปุ๋ยสด

Chiang Dao



Canavalia ensiformis

Jack Bean

ถั่วพราง

▲ 0-1800m

Used as fodder for ruminants.

Seeds are toxic. Special preparation required to be consumed.

Jack Bean produces large leaves, smooth pods edible when tender, and large, smooth, white seeds. 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.

ECHO



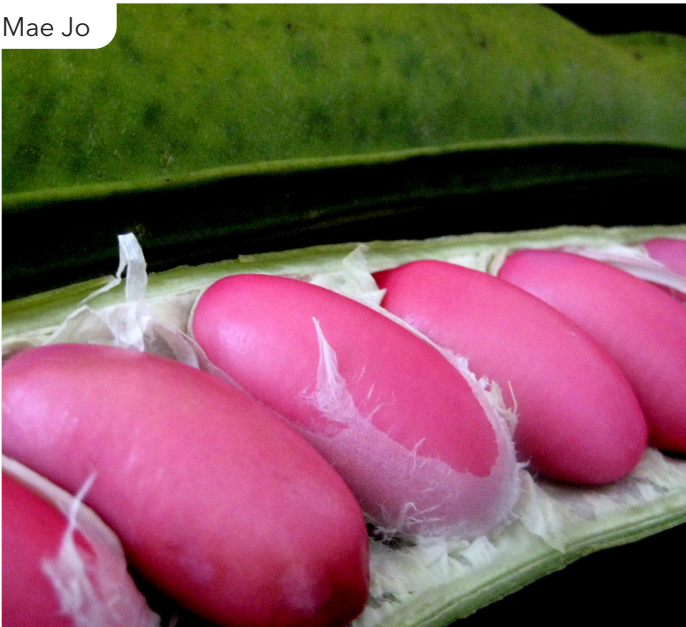
Chiang Dao

Bushy growth. Matures in 120 days.

ECHO

An aggressive climber.

Mae Jo



Canavalia gladiata

Sword Bean

ถั่วดาบ

▲ 0-1000m

Seeds are somewhat toxic. Special preparation required to be consumed.

Sword Bean is a drought-tolerant legume known for its extremely large seed pods (25-35 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 crosswise before being prepared in stir-fry dishes and curries. Seeds from green pods can be prepared for consumption by boiling for 10 minutes and peeling. Sword Bean prefers the humid lowland tropics with temperatures of 15-30°C but may be grown successfully in tropical elevations of up to 1000 m. Sword Bean will grow with annual rainfall between 700-4200 mm. Optimum growth occurs in full sunlight, but the plant tolerates some shade.

Mae Jo

Large, pink seeds. Matures in about 180 days.

Pulses & Green Manure/Cover Crops

Burma Red



Cicer arietinum

Chickpea

ถั่วหัวช้าง

▲ 0-1200m

One of the oldest cultivated legumes recorded, Chickpea is the world's second most important pulse crop. 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 annual rainfall. 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 Red

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

Burma Round

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

Burma Round



Crotalaria juncea

Sunn Hemp

ปอเทือง

▲ 0-1500m

Can be used as animal fodder. However, it contains toxins and thus should not form more than 10% of a cow's diet and should not be fed to horses and pigs.

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. Fiber from the bark is used to make rope, canvas, fishing nets, 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 show 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 a coarse fiber with low yields if grown in heavy clay.

Chiang Mai

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

Chiang Mai



พืชคลุมดิน/พืชปุ๋ยสด

CASC Cambodia



Crotalaria ochroleuca

Crotalaria

ปอเทือง

▲ 300-2000m

Used as livestock fodder.

Crotalaria is an erect, branched annual growing up to 2.5 m tall. It is grown as a leafy vegetable in several African countries where the young shoots and leaves are boiled and eaten. It is known to suppress Meloidogyne root-knot nematode populations. Thus, it can be placed in crop rotation or used as a companion crop with nematode-susceptible vegetables such as tomatoes. The leaves have been used to treat 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 may take about eight weeks until the first harvest. The plant dies after about six months. The young crop is incorporated in the soil if sown as a green manure cover crop. For mulch, the plants are uprooted or cut at the soil level and placed between the crop rows. A once-over harvest yields about 1 kg/m²—a green manure crop yields about 2 kg/m² fresh organic matter.

CASC Cambodia

Small, yellow seeds. Pod is similar, but larger, than Sunn Hemp pod.

GMCC



Fagopyrum esculentum

Buckwheat

บัควีท

▲ 0-1500m

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 or 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.

GMCC

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

Pulses & Green Manure/Cover Crops

Local Thai



Glycine max

Soybean

ถั่วเหลือง

▲ 0-2000m

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 fully mature and dried. In dry form, Soybeans are used in various dishes throughout Asia, including soups, salads, and desserts. Sprouts can also be eaten in multiple forms. Soybeans are used in different food products, including curd, tofu, milk, sauces, and meat and dairy substitutes. Fermented versions are used in multiple culinary traditions as a base and to provide a 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 taproot that reaches as much as 2 m in depth. Planted 2.5-4 cm deep, it can be spaced according to need, from 20-75 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.

Local Thai

Produces well. Small seeds.

Lao



Gossypium hirsutum

Cotton

ฝ้าย

▲ 0-2200m

Cotton is pest resistant, tolerant of variable conditions such as low water, and highly productive. It thrives at elevations between 0-1500 m. The plants can be pruned after harvest for new growth/production. If taken care of well, each plant can produce for two or more years as a short-term perennial. The cotton gathered can be used for making thread for clothing.

Lao

Light yellow flower.

พืชคลุมดิน/พืชปุ๋ยสด

Chiang Dao



Lablab purpureus

Field Lablab

ถั่วแปะยี

▲ 0-2100m

The growing crop can be grazed by cattle, goats, pigs, and sheep.

Lablab beans can be sprouted, soaked in water, shelled, boiled, and then smashed into a paste fried with spices. Dried seed can be processed as 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 as a cover crop and for pulse production. Field Lablab varieties are drought-resistant summer annuals or short-lived perennials. The plant grows best at average daily temperatures of 18-30°C but tolerates high temperatures. Lablab is also cold tolerant and can grow at temperatures down to 3°C for short periods; it can also tolerate very light frosts. It is drought tolerant when established and will grow even if rainfall is less than 500 mm, but it 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 a pH between 4.5 and 7.5, with good drainage. However, Lablab has a low salinity tolerance.

Chiang Dao

White seeds.

Highworth

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

Highworth



Macrotyloma uniflorum

Horse Gram

ถั่วขี้ม้า

▲ 0-1500m

Can help supplement grazing or be used as a fodder crop in dry season feed. It can be cut as a green fodder 6 weeks after sowing.

Burmese



Horse Gram is a lesser-known climbing annual that can be used as a pulse for livestock and human consumption. In India, particularly in the southern region, Horse Gram is consumed as whole seed, sprouts, or meal. 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 of about 5.0-8.0 and tolerates low rain. It should be grown in the sun and produces best in the hot season. Horse Gram is a short-day flowering plant and will typically flower in 120-180 days. It is relatively free of disease and pests.

Burmese

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

Pulses & Green Manure/Cover Crops

Bush



Mucuna pruriens Velvet Bean

หมามุ่ย

▲ 0-2100m

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 for poultry. Vines can be grazed, made into hay, or mixed with corn as silage.

Not recommended for human consumption due to the presence of L-dopa.

Velvet Bean is an annual legume crop extremely valuable for intercropping in cornfields, rehabilitating depleted land, and controlling weeds. It is a good green manure and can 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.

Bush

Doesn't climb. White seeds with black speckles.

Chiang Dao

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

Tropical

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

Chiang Dao



Tropical



Pennisetum glaucum Pearl Millet

หญ้าไข่มุก

▲ 0-2000m

Small amounts are used for animal feed, most often as green fodder.

Pearl Millet grain is used as flour or grain-like rice. It is used in making bread (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 good potential. 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.

Palawan

Tall prolific seed producer. Generally resistant to disease.

Palawan



พืชคลุมดิน/พืชปุ๋ยสด

Tan/Grey



Phaseolus acutifolius

Tepary Bean

ถั่วเทปารี

▲ 0-1900m

Biomass can be utilized as fresh forage for livestock, or preserved as silage or hay. Fodder can be harvested through regular pruning.

Tepary Bean is a vining or bushy annual reaching lengths of 4 m. Grown for its mature seeds, its young pods can also be eaten. 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 and cooked in stir-fries and soups. Mature seeds can 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 anti-nutrients.

Tan/Grey

Wilt tolerant. Resistant to blight and rust.

Bhutanese Bush



Phaseolus vulgaris

Cranberry Bean

ถั่วแครนเบอร์รี่

▲ 1000-3000m

Eaten as either a fresh, green vegetable or a dried, cooked pulse, Cranberry Bean is low in fat, high in calcium, phosphorus, and iron, and contains 22% protein. It prefers a cool growing season and 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.

Bhutanese Bush

Bush variety. Does not need a trellis.

Mae Ai

Pole variety. Good resistance to disease. A creamy, nutty flavor.

Mae Ai



Pulses & Green Manure/Cover Crops

Ubon



Stylosanthes capitata

Stylo

ถั่วสไตโล

▲ 0-1000m

Stylo is a short-lived perennial shrub used in permanent pastures for intensive grazing. Scarification for 5 minutes can improve germination. Seed should be sown at most 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 if the pH is more than 5.5. While rainfall in its native habitat is 1500 mm per year, it can tolerate rainfall as low as 500 mm per year but not flooding. Stylo prefers full sunlight and flowers on short days. It is susceptible to anthracnose disease, and stem borers and budworms can drastically reduce seed yield. Stylo is self-pollinated and can easily spread by its seed drop; it should be monitored for the potential to invade.

Ubon

From Kasetsart University's forage research station. Prolific bush variety. Easily grown through dry season with little irrigation.

Vigna angularis

Adzuki Bean

ถั่วอะซูกิ

▲ above 420m

Adzuki Bean is an annual vine with a small bean. Grown throughout East Asia and the Himalayas, it 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 of magnesium, potassium, iron, and zinc. Adzuki Bean should be spaced 7-15 cm and planted about 2.5 cm deep. It will grow about 60-90 cm tall. 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

Bushy with red seed and green pod. Good production.

Vigna radiata

Mung Bean

ถั่วเขียว

▲ 0-2000m

Mung Bean is an early-maturing, slightly vining legume which is high-yielding and widely adaptable. It is cultivated most extensively in the India-Burma-Thailand region of Southeast Asia but is also found in Iran, Pakistan, Vietnam, and China. Mung Bean is used in desserts, ground for flour, or sprouted for other dishes. Its protein content is approximately 25%. It is a short-season crop requiring 60 to 90 days from planting to maturity. It grows mainly at 20-40°C in areas with average rainfall of 600-1000 mm but can survive with less precipitation. 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.

Burmese Green

Day-neutral, bush variety. Green seed.

Lao

Day-neutral, bush variety. Green seed. 60 days to maturity.

Lombok

Tall 1 m variety. Larger pods and more seed.

Palawan



Burmese Green



Lao



Lombok



พืชคลุมดิน/พืชปุ๋ยสด

Chiang Dao



ECHO



Vigna umbellata

Rice Bean

ถั่วแป๋

▲ 0-1800m

Known as a high-quality fodder.

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 often served in India as a dhal and can be made into flour. It can help with soil improvement and is often relay-cropped with corn as a green manure/cover crop as it fixes nitrogen at 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 five months from planting to maturity.

Chiang Dao

Local Thai variety. Red seed.

ECHO

Light yellow-green seed.

Olive Green

Olive colored seed. Slightly larger than other varieties.

Thai Department of Agriculture

Local Thai variety. Black seed.

Thai Green

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

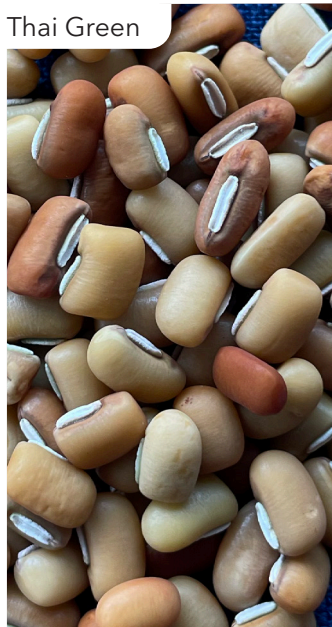
Olive Green



Thai Department of Ag.



Thai Green



Pulses & Green Manure/Cover Crops

Chiang Dao



India Black Eyed Pea



Vigna unguiculata

Cowpea

ถั่วขอ

▲ 0-2000m

Cowpea can be eaten as a leafy vegetable, its seeds eaten green or dried, and its young pods eaten like green beans. In Tamilnadu in Southern India, cooked and mashed Cowpeas are combined with jaggery, ghee, and other ingredients to make cake-like sweets. Often used as a green manure/cover crop and in relay-cropping, Cowpea is intercropped with upland rice in Northern Thailand. It 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 the soil is well drained, properly inoculated, and moderately rich with lime.

Lahu/Mae Ai



Chiang Dao

Vining variety less than 1 m long. Pods approximately 20 cm long. Black seed.

India Black Eyed Pea

Prolific variety. Trellising needed. White seed with a black spot around hilum.

Lahu/Mae Ai

Bush variety. Good resistance to disease. Grayish seed.

Pa-O

Vining variety with bumpy pods. Speckled dark brown and white seed.

Samoeng

Short, vining variety. Often intercropped with upland rice. Tasty plump pod. Black seed.

Pa-O



Samoeng



Bhutanese



Clemson Spineless



Abelmoschus esculentus

Okra

กระเจียบเขี้ยว

▲ 0-1000m

Okra is an upright annual 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, or lime cuts mucilage. Okra can be fried with chilies or boiled. It grows best in hot climates and needs full sunlight on fertile, well-drained soils. Okra thrives on well-manured loam with a pH of 6.0-7.0.

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.

Manee Maejo

Green and light maroon pods. Longer pods than Red Maroon variety.

Red Maroon

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

Star of David

Non-hairy variety. Less slimy than other varieties.

Manee Maejo



Red Maroon



Star of David



Vegetables

Chiang Mai Red



Chiang Mai White



Amaranthus tricolor Vegetable Amaranth ผักโขมผัก

▲ 0-2000m

Leaves are used as feed for pigs and other livestock.

A mostly short-day crop, Vegetable Amaranth is a fast-growing, short-lived annual grown for its protein-rich leaf and shoot tips. It is also high in calcium and iron. Leaves can be eaten raw but are usually cooked. Vegetable Amaranth grows well in hot-humid and hot-dry climates and can grow in various soil types and soil moisture levels. It can tolerate a range of soil pH between 4.5 and 8.0.

Chiang Mai Red

Red leaves.

Chiang Mai White

Green leaves with white stems.

Greenleaf

Light green leaves.

Tigerleaf

Green and red striped leaves.

Greenleaf



Tigerleaf



Buriram



Asparagus officinalis Asparagus ผักหน่อไม้ฝรั่ง

▲ 0-1400m

Asparagus is a herbaceous perennial whose tender shoots are eaten as a vegetable. In Thailand, Asparagus is grown year-round. Seedlings can be transplanted or directly seeded 10-15 cm apart. Shoots are harvested after the plant is established, preferably after 12 months in the field. Asparagus prefers full sun and well-drained, loose soils with a pH of 6.0-6.8. Asparagus is sometimes planted with tomatoes, as the tomatoes repel the asparagus beetle, and the asparagus helps repel some harmful root nematodes.

Buriram

Green variety.

AVRDC



Bangladesh



Basella alba **Malabar Spinach** ผักปลัง

▲ 0-1500m

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 various soil conditions but does best on slightly acidic, humus-rich sandy loams with a pH of 6-6.7. Long, thick vines do well sprawling on the ground over other plants or trained to trellises. Produces edible shoots in 70 days.

AVRDC

Smaller-leaved than Bangladesh variety.

Bangladesh

Large-leaved, heat tolerant variety.

Arunothai



Benincasa hispida **Wax Gourd / Wintermelon** ฟักเขียว

▲ 0-1000m

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 typical, with solid white flesh and cucumber-like seeds. Fruit may be eaten raw or cooked and 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.

Arunothai

Round variety about 15 cm across.

Buriram Short

Short, green gourd about 20-25 cm long.

Upland Mix

Large, green gourd about 45-60 cm long.

Buriram Short



Upland Mix



Vegetables

ECHO



Brassica carinata

Ethiopian Kale

ผักคะน้าฝรั่ง

▲ 0-2600m

Reportedly used as a fodder crop.

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 high in protein, vitamins A and C, and are a good source of minerals. Ethiopian Kale is propagated from seed, and seeds germinate rapidly in moist soil. Seed is often broadcast or can be planted in rows. Plants can tolerate cooler temperatures and, in Kenya, are grown at 0-1600 m altitude with a rainfall range of 600-1600 mm. The plant grows up to 1-1.5 m in height and continues producing 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.

Khasi



Lao



ECHO

Blue-green leaves. Grows to about 1.5 m tall.

Brassica juncea

Mustard Greens

ผักกาดเขียว

▲ 0-2000m

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 milder temperatures from 15-18°C and can tolerate annual rainfall between 500-4200 mm. It is best planted at the end of the rains, just before the cool season. It prefers loamy, well-drained soil and a pH of 5.5-6.8.

Khasi

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

Lao

Light green leaves with a white stem.

Mix Variety

A mix of several varieties from Northern Thailand.

Mix Variety



Mae Tha



Brassica oleracea var. alboglabra

Chinese Kale

ผักคะน้า

▲ 0-1000m

Chinese Kale, also called "Kailaan" or "Chinese Broccoli," has glossy, blue-green leaves with crisp, thick stems. This vegetable adapts well to hot and cold climates and is grown year-round in mild climates. After the first cutting of the main stem, the plant will produce 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.

Mae Tha

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

Extra Dwarf Pak Choi



Brassica rapa var. chinensis

Pak Choi / Bok Choy

ผักกวางตุ้งฮ่องเต้

▲ 500-1500m

Pak Choi is from the cabbage family. It is 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 other dishes that call for cooked or fresh greens. This crop prefers cooler weather and is perfect for marketing, as planting to harvest is around 5-6 weeks.

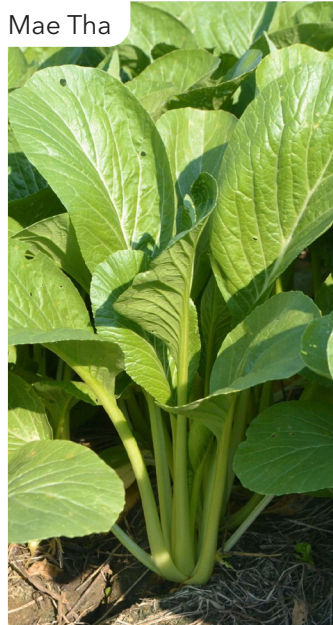
Extra Dwarf Pak Choi

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

Burmese



Mae Tha



Brassica rapa var. parachinensis

Choy Sum

ผักกาดกวางตุ้ง

▲ 0-2000m

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.

Burmese

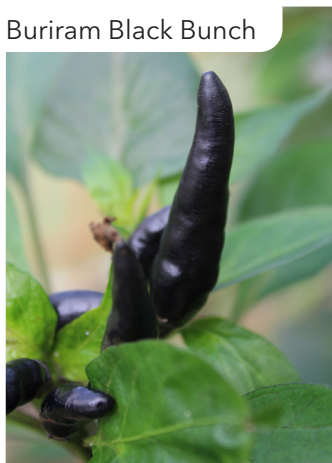
Smaller leaves. From the Irrawaddy Delta region.

Mae Tha

Productive, large-leafed variety.

Vegetables

Buriram Black Bunch



Buriram Cherry



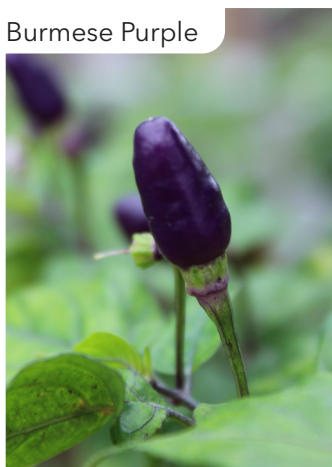
Capsicum frutescens Chili Pepper

พริก

▲ 0-1800m

Chili Peppers are eaten raw or cooked and can be dried and ground into a powder for flavoring. Leaves are sometimes cooked as a potherb. Chili Peppers 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 loam or silt loam soil with good water-holding capacity but can grow in many soil types if the soil is well-drained. It tolerates a pH of 4.3 to 8.3.

Burmese Purple



Esaan



Buriram Black Bunch

Hot, black peppers. Grow in bunches. 3-5 cm long.

Buriram Cherry

Small, cherry peppers. 1.4-1.7 cm long

Burmese Purple

Hot, deep purple to magenta to red peppers. 2-4 cm long.

Esaan

High yield, vigorous. 7.5 cm long.

Hawaiian

Mild peppers. 4-6 cm long.

Karen

Hot, red peppers. 2-4 cm long.

Mae Ai Cream

Hot, white peppers. 2-4 cm long.

Tiny Hot

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

Hawaiian



Karen



Mae Ai Cream



Tiny Hot



Chiang Mai Mix



Clitoria ternatea Butterfly Pea

ดอกอัญชัญ

▲ 0-1800m

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 flavor 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 various soil types with a pH of 4.5 – 9.0, including calcareous soils, and can survive both extended rainfall and prolonged periods of drought.

Chiang Mai Mix

White and blue flowers.

ECHO



Cnidoscolus aconitifolius Chaya

ชายา

▲ 0-1300m

Raw Chaya leaves are toxic, as they contain a cyanide-producing glucoside. However, boiling for 10 minutes inactivates the toxic compounds.

The entire plant may be ground, dried, and used as animal feed as long as it does not constitute more than 10% of the diet.

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. It is moderately frost-tolerant and can tolerate drought and hot, humid weather. However, it does not tolerate water-logged soils and has been killed by standing water within a few days. The plant tends to be highly disease and pest-resistant. Chaya grows in various soil conditions but performs poorly in highly acidic soils. Typically, it does not set seed and is propagated by cuttings.

ECHO

Leaves do not have irritating hairs.

Vegetables

Khmer



Lampang



Cucumis sativus Cucumber

แตงกวา

▲ 0-1800m

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 monthly rainfall of 100-200 mm 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.

Lampang

Light green fruit over 20 cm long. Often planted with highland rice.

Mae Tha

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

Mae Tha



Daucus carota Carrot

แครอท

▲ above 500m

Both tops and roots can be used for small animal and livestock fodder.

Carrots are a biennial herb with a swollen taproot 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 in the carrot root. In Java, the leaves are also sometimes eaten. 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 flower stem. Less pests.

Uberlandia

Tropical variety from ECHO Florida.

Pyin Oo Lwin



Uberlandia



Thung Kwang Tong



Glebionis coronaria Edible Chrysanthemum

ผักชีว้า/ผักตังโอ๋

▲ 0-1000m

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.

Edible Chrysanthemum, also known as "Shungiku" or "Garland Chrysanthemum," is a leafy, annual herb up to 90-120 cm tall. Its flowers have a yellow center 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 but will 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.

Thung Kwang Tong

Edible leaves with a pungent smell. Good for companion planting.

Bhutanese



Burmese



Hibiscus sabdariffa Roselle

กระเจี๊ยบแดง

▲ 0-600m

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 several 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 low temperatures kill the plant. 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 is preferable. However, it will adapt to various soils.

Bhutanese

Big fruit, dark leaves, and thick calyces. Good for making drinks.

Burmese

Hardy, red-stem. 90 days from seed to flower.

Royal Project

Similar appearance to Bhutanese, but longer fruit and stalk.

Royal Project



Vegetables

Chiang Mai



Ipomoea alba Moonflower

ดอกชมจันทร์

▲ 0-600m

Often called Moonflower or "Moon Vine," *Ipomoea alba* is only one of many plants with the same common name. It is a species of Morning Glory native to the Americas but naturalized throughout the world. Moonflower is a perennial long-stemmed woody vine producing fragrant white or pink flowers 8-14 cm in diameter. The flowers open in the evening and remain open until 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 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 and requires well-drained soil. Best grown on a trellis, the vine can be up to 2-5 m long.

Chiang Mai

Produces hundreds of large white flowers.

Chiang Dao



Lablab purpureus Vegetable Lablab

ถั่วแปบ

▲ 0-2100m

Raw dry seed is reportedly poisonous.

Vegetable Lablab is a climbing, semi-perennial legume grown for its edible pods, leaves, and flowers. Young and old seeds are consumed once cooked. 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. 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.

Chiang Dao

Purple pods with black seed.

Thai Light Green

Light green pods with red seed.

Thai Light Green



Celtuce



Green Bowl



Lactuca sativa

Lettuce

ผักสลัด

▲ above 1000m

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, lettuce is consumed raw as a side vegetable to dip in chili sauces and curries in addition to use in salads. It is also boiled as a potherb, pickled, braised, sautéed, fried, pureed, or used in soups and stews.

Celtuce

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

Green Bowl

Green leaves with wavy edges.

Mini Cos

Long, wide leaves.

Queensland

Slow-bolting, heat-resistant, big leaf Cos/Romaine lettuce type.

Red Bowl

Deep red-maroon leaves with wavy edges.

Red Oak

Densely bunched, deep red leaves.

Mini Cos



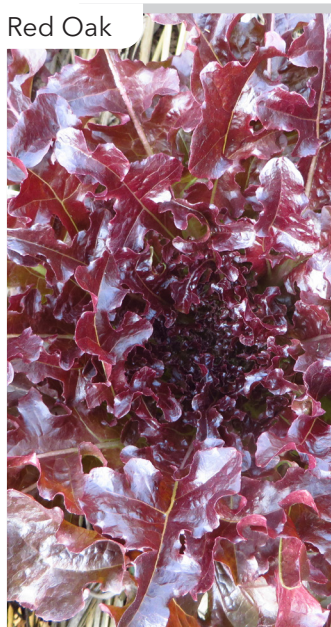
Queensland



Red Bowl



Red Oak



Vegetables

Burmese



Caveman's Club



Lagenaria siceraria

Calabash Gourd

น้ำเต้า

▲ 0-2500m

Young Calabash Gourd fruit is eaten throughout Asia in the same way as pumpkin and is often used in curries. The young shoots and leaves are also eaten as vegetables. The seeds, which contain 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 the 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 and a good compost layer. Calabash Gourd should be grown on a trellis.

Burmese

Very large oblong fruit up to 50 cm long.

Caveman's Club

Wrinkled-looking fruit with a crooked neck.

ECHO Bottle Gourd

Light green multi-globed fruit up to 15 cm long.

Om Koi Long

Fruit up to 60 cm long.

ECHO Bottle Gourd



Om Koi Long



Nepal



Lepidium sativum

Garden Cress

เทียนแดง

Garden Cress is a fast-growing, edible plant. Its shoots are typically harvested one to three weeks after planting when they are 5-13 cm tall. Garden Cress is added to soups, sandwiches, and salads for its spicy and slightly bitter flavor. In Thailand, it is also used as a herbal medicine. Garden Cress can be sown in rows about 20-30 cm apart. The plant prefers well-drained soil. Garden Cress takes about three months from planting to harvest if grown for seed.

Nepal

White and purple flowers. Mature brown pods with small, oval, red seeds.

Burmese



Chiang Dao



Luffa acutangula Angled Luffa

บวบเหลี่ยม

▲ 0-1800m

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 also be grown in the wet tropics. 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 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.

Burmese

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

Chiang Dao

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

Buriram Round



Burmese Bunch



ECHO



Luffa aegyptiaca Smooth Luffa

บวบหอม

▲ 0-1800m

Smooth Luffa is a climbing annual that produces oblong or round, fibrous fruit with black seeds. The young leaves, shoots, and fruit are eaten. Older, dry fruits 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 the best growth is obtained by planting at the beginning of the rainy season. Luffas are frost-sensitive, making it difficult to grow them in temperate climates.

Buriram Round

Smooth, round fruit.

Burmese Bunch

Bunches of 5-6 oval fruit about 8-10 cm long. Black seeds.

ECHO

Produces smooth, plump fruit.

Thai Long

Produces smooth fruit about 30 cm long.

Thai Oval

Produces large, oval fruit.

Thai Long



Thai Oval



Vegetables

Khmer



Momordica charantia Bitter Gourd

ឈ្មួញ

▲ 0-500m

The immature fruit of Bitter Gourd and its 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 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. Bitter Gourd is a slender annual climbing to 3-3.5 m tall. The fruits are pear-shaped or oblong. 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 and regular rainfall or irrigation.

Khmer

Fruits are 10-15 cm long.

Local Thai

Fruits are 23 cm long.

Local Thai



Regional Mix



Moringa oleifera Moringa

ឈ្មួញ

▲ 0-2500m

Moringa is a tree with small, rounded, compound leaves and long pods with large, winged seeds. Leaves are exceptionally 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 is 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 handle 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.

UHDP



Oroxylum indicum Indian Trumpet Flower

เพกา

▲ 1100-2000m

Indian Trumpet Flower grows well in warm tropical and subtropical regions with moderate rainfall. It has a tall, erect trunk with large, padded fruits hanging from bare branches. The pods are used in traditional medicine throughout the region as studies have shown that stem bark, root bark, and fruit exhibit antimicrobial, anti-inflammatory, and antioxidant properties, among others. Large pods are eaten when young. They are bitter in taste and may be soaked in salt water or grilled over a fire to be made more palatable before being sliced into smaller strips and either stir-fried or used in curries. Germinate seeds in a nursery area. After three 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 excellent for intercropping or agroforestry systems. However, it can be susceptible to powdery mildew and may be affected by aphids or mites.

UHDP

Collected from UHDP Center's agroforestry plots.

Laoda



Pachyrhizus erosus Yam Bean, Jicama

มันแกว

▲ 0-70m

Leaves and beans contain rotenone, a natural insecticide, and should not be consumed.

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. 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 pH of 6.5-8.

Laoda

Vigorous growth. Prefers full sun.

Vegetables

Burma Red



Christmas Pole



Phaseolus lunatus

Lima Bean

ถั่วราชมาช

▲ 0-2400m

Raw seeds may be toxic

Dried vines may be used as animal fodder.

The immature shoots, leaves, green-shelled beans, and pods of Lima Beans are consumed in Asia. 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. Lima Beans should be planted at the beginning of the rains, as a dry period is needed for seeds to mature.

Burma Red

Medium-sized red beans. Indeterminate climber.

Christmas Pole

Large maroon-white mottled beans with dark red splashes. Heavy yields even in very hot weather. Long vines.

Pa-O

Small seeds with white and red polkadots.

7-Year

Half white and pink beans.

Pa-O



7-Year



Bhutanese



Huay Hom



Phaseolus vulgaris

Green Bean

ถั่วแขก

▲ 1000-3000m

Vines and foliage can be used as fodder.

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. Green Beans do well in the tropics 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.

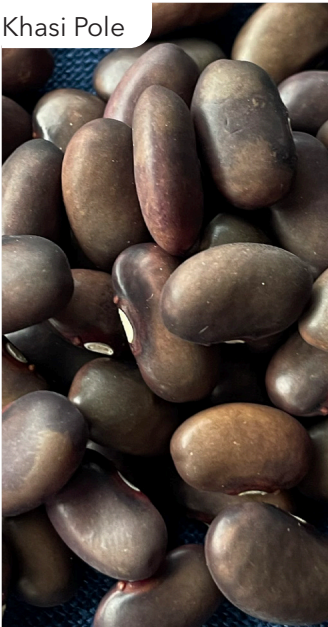
Bhutanese

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.

Khasi Pole



Naga Pole



Khasi Pole

Pods about 12 cm long with dark brown seeds.

Naga Pole

Tender, sweet pods about 12 cm long. Brown seeds with a distinctive swirl pattern.

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.

Naga Speckled



Pa-O



Vegetables

Mae Hong Son



Phaseolous vulgaris

Kidney Bean

ถั่วแดงหลวง

▲ 200-600m

Raw seeds contain high amounts of phytohemagglutinin and are toxic if not pre-soaked and boiled for at least 10 minutes. 30 minutes is preferable.

The Kidney Bean is a herbaceous annual. It is a bush variety of the common bean with its characteristic green immature pod. Kidney Beans can be direct seeded with 2-3 seeds per hole, planted 20-25 cm apart. The pod is 1.2-1.5 cm wide and 8-10 cm long, with 3-6 seeds per pod. Kidney Beans prefer full sun and well-drained, loose, friable soils with a pH of 5.5 to 6.5.

Mae Hong Son

Big red seeds.

Burmese



Pisum sativum var. macrocarpum

Snow Pea

ถั่วลันเตา

▲ 0-1000m

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 well-drained soil. Plants can be directly 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

Prolific producer of delicious pods with a soft, melting flavor.



Bogor



Day Neutral



Pang Daeng Nawk



Purple Esaan



Purple Mae Tha



Songkhla

Psophocarpus tetragonolobus Winged Bean

ถั่วพู

▲ 0-1000m

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. Harvested while tender and bendable, young pods can be boiled and served like green beans or used with dipping sauces and curries. Protein-rich bean milk and flour are also beneficial dietary treatments for protein-deprived children. Winged Bean thrives in hot, wet climates, although a dry period is favorable for pollination and the production of mature pods. It grows well under various 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 grown year-round.

Bogor

Short day-length variety. Vigorous yields. 20 cm long pods.

Day Neutral

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

Pang Daeng Nawk

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

Purple Esaan

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

Purple Mae Tha

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

Solanum benth Edible Leaf Solanum

มะเขือกินใบ

▲ 0-1000m

Native to Southern 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 two months after transplanting, the plant will begin to produce flowers. Edible Leaf Solanum thrives in all tropical seasons and will bear fruit for about two years. Leaves are soft and can be consumed when green or mature. Fruit is also edible, though leaves and fruit are generally cooked before eating.

Songkhla

Leaves similar in flavour to Chinese Cabbage. Fruit slightly bitter. High yield.

Vegetables

Burmese



Columbia Yellow



Dark Zebra



Deep Red Fat Bumpy



Mae Tha



Partner



Solanum lycopersicum

Tomato

มะเขือเทศ

▲ 0-2000m

The Tomato is an erect or spreading 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 various ways and are high in lycopene, an antioxidant. The Tomato is closely related to potatoes, eggplants, and peppers. It 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 necessary for optimum development. High relative humidity can harm tomato crops, and fruits rarely ripen fully in wet weather. The 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.

Burmese

Medium sized, dark red fruit. Indeterminate.

Columbia Yellow

Mild flavor, not sour. Tolerant and very productive.

Dark Zebra

Large variety. Sweeter than Mae Tha. Eaten raw or used for tomato sauce.

Deep Red Fat Bumpy

A little sweet. Mashed for tomato sauce or soup.

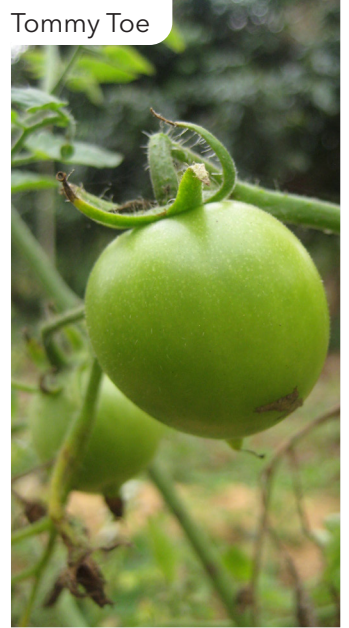
San Sai



Sweet Cherry



Tommy Toe



UHDP



Yellow Pear



Mae Tha

Large sweet variety. Used for tomato sauce.

Partner

Similar to Tommy Toe.

San Sai

Round fruit. Disease resistant.

Sweet Cherry

Small, sweet, cherry variety. Grows easily.

Tommy Toe

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

UHDP

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

Yellow Pear

Sweet, yellow variety. Eaten raw.

Vegetables

Buriram Crispy



Burmese Bitter



Chachoengsao



Chiang Rai Bitter



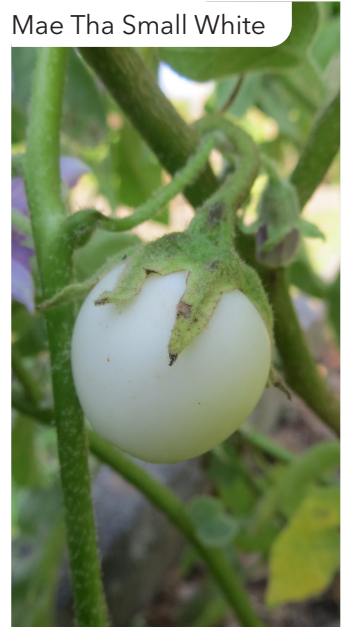
Crispy Purple



Mae Tha Crispy Green



Mae Tha Small White



Solanum melongena Eggplant

มะเขือ

▲ 0-900m

Eggplant is an annual or semi-perennial shrubby plant. In Southeast Asia, immature fruit is eaten raw with chili paste, boiled, fried, or stuffed. It is common 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 of 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.

Buriram Crispy

Small, light green, crispy fruit. Prolific producer.

Burmese Bitter

Green and red fruit with bumpy ridges. Bitter flavor.

Chachoengsao

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

Chiang Rai Bitter

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

Crispy Purple

Small, light purple fruit.

Naga



Nakornsrihammarat



Phupan



Pingtung Long



Thung Kwang Tong



Yellow



Mae Tha Crispy Green

White and green crispy fruit. Eaten raw in salads or with spices.

Mae Tha Small White

Small, white fruit with a crunchy texture. Strong, prolific producer.

Naga

Large fruits produced year-round. Perennial. Plant in cold season.

Nakornsrihammarat

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

Phupan

Giant white fruit around 800g

Pingtung Long

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

Thung Kwang Tong

Deep purple with fleshy meat. 20 cm long.

Yellow

Edible when young and green and when a mature yellow. Productive in hot, humid weather.

Vegetables

Burmese



Solanum quitoense Naranjilla

มะเขือขน

▲ 900-2400m

Naranjilla is a thorny perennial that can reach 2.5 m in height. It produces yellowish-orange fruits similar to tomatoes. The berries have a subacid flavor and are used to make juices, jams, jellies, and flavor 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 be rubbed off when ripe; wearing gloves when handling is advised. This fruit can grow at a low elevation (300-400m) but 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.

Burmese

Round edible fruit 20 cm long. Sour flavor.

AVRDC



Solanum scabrum African Nightshade

มะแว้งนก

▲ 0-2000m

Can be used as animal fodder.

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 are bitter in taste. Fruits are typically not eaten. Young shoots and leaves are blanched, boiled, stir-fried, cooked with other vegetables or added to soups. 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.

AVRDC

Berries are bitter and usually not eaten.

Esaan



Trichosanthes anguina Snake Gourd

บวบงู

▲ 0-1500m

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

Esaan

Dark/light green fruit, 35 cm long.

Burmese



Chinese Red Noodle



Vigna unguiculata subsp. sesquipedalis

Yard Long Bean

ถั่วฝักยาว

▲ 0-1000m

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 fresh and cooked. They 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.

Burmese

Similar to Thung Kwang Tong.

Chinese Red Noodle

Red pods, 58 cm long. Prolific producer.

Kachin

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

Thung Kwang Tong

Green pods, 40 cm long. Soft in texture.

Yasothon Bush

Dark red pods. Bush variety.

Kachin



Thung Kwang Tong



Yasothon Bush



Seed Bundles



Green Manure/Cover Crop Bundle

กลุ่มพืชคลุมดิน/พืชปุ๋ยสด

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 Asian region. All are edible except Stylo, which is used for fodder.

Seeds included

1 Cowpea

1 Field Lablab

1 Horse Gram

1 Mung Bean

1 Pigeon Pea

2 Rice Bean

1 Stylo

1 Sunn Hemp

1 Velvet Bean



Herb/Flower Bundle

กลุ่มสมุนไพรและดอกไม้

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.

Seeds included

1 Cosmos

1 Dill

1 Ghost Pepper

1 Holy Basil

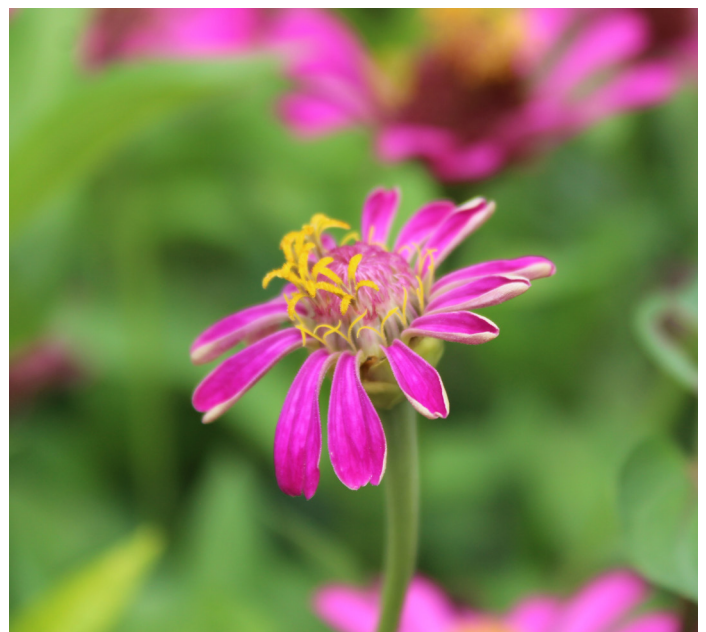
2 Marigold

1 Mexican Sunflower

1 Sawtooth Coriander

1 Sweet Basil

1 Zinnia



Seed Bundles



Nutrition Garden Bundle

กลุ่มพืชสารอาหารสูง

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

Seeds included

1 Chia

1 Cranberry Bean

1 Eggplant

1 Ethiopian Kale

1 Quinoa

2 Sesame

1 Tomato

1 Vegetable Amaranth

1 Winged Bean



Salad Garden Bundle

กลุ่มสลัดสวนครัว

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

Seeds included

1 Cape Gooseberry

1 Carrot

1 Edible Leaf Solanum

2 Lettuce

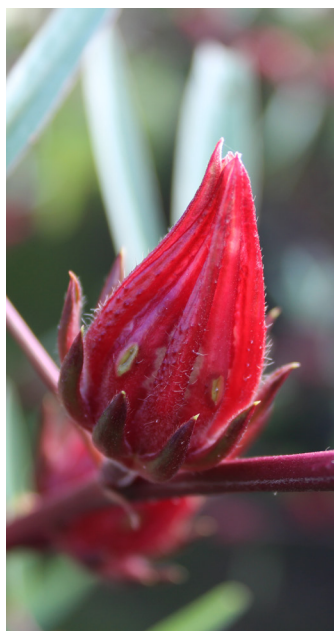
1 Mustard Greens

1 Okra

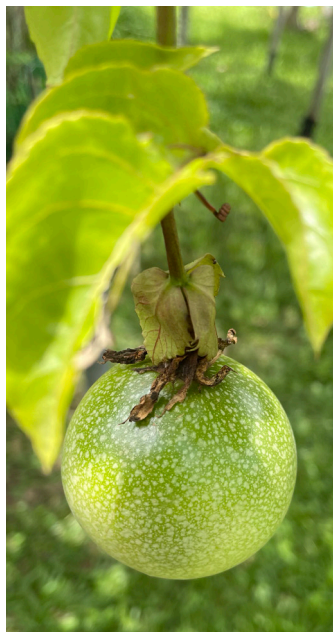
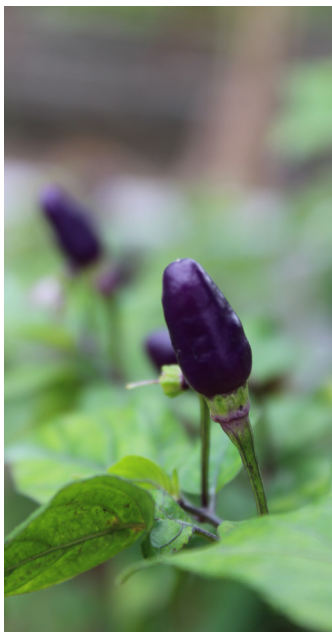
1 Roselle

1 Tomato

1 Yard Long Bean



Seed Bundles



Semi Arid Bundle

กลุ่มกิ่งแห้งแล้ง

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

Seeds included

1 Chili Pepper

1 Foxtail Millet

1 Inca Nut

1 Job's Tears

1 Lima Bean

1 Moonflower

1 Passion Fruit

1 Pearl Millet

1 Sorghum

1 Tepary Bean



Urban Garden Bundle

กลุ่มผักสวนครัว

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

Seeds included

1 Chinese Kale

1 Choy Sum

1 Coriander/Cilantro

1 Ethiopian Kale

1 Holy Basil

2 Lettuce

1 Mustard Greens

1 Sweet Basil

1 Tomato



Index by Scientific Name

สารบัญตามชื่อวิทยาศาสตร์

Abelmoschus esculentus	39	Mucuna pruriens	34
Amaranthus cruentus	10	Nicotiana tabacum	20
Amaranthus tricolor	40	Ocimum basilicum	20
Anethum graveolens	17	Ocimum tenuiflorum	21
Asparagus officinalis	40	Oroxylum indicum	53
Basella alba	41	Pachyrhizus erosus	53
Benincasa hispida	41	Passiflora edulis	9
Brassica carinata	42	Pennisetum glaucum	34
Brassica juncea	42	Phaseolus vulgaris	56
Brassica oleracea var. alboglabra	43	Phaseolus acutifolius	35
Brassica rapa var. chinensis	43	Phaseolus lunatus	7
Brassica rapa var. parachinensis	43	Phaseolus lunatus	54
Cajanus cajan	28	Phaseolus vulgaris	35
Calendula officinalis	17	Phaseolus vulgaris	55
Canavalia ensiformis	29	Physalis peruviana	9
Canavalia gladiata	29	Pisum sativum var. macrocarpum	56
Capsicum chinense	17	Plukenetia volubilis	27
Capsicum frutescens	44	Psophocarpus tetragonolobus	57
Carica papaya	8	Salvia hispanica	12
Chenopodium quinoa	11	Senna siamea	25
Cicer arietinum	30	Sesamum indicum	27
Clitoria ternatea	45	Sesbania grandiflora	25
Cnidioscolus aconitifolius	45	Setaria italica	12
Coix lacryma-jobi	11	Solanum benth	57
Coriandrum sativum	18	Solanum lycopersicum	58
Cosmos bipinnatus	18	Solanum melongena	60
Cosmos sulphureus	18	Solanum quitoense	62
Crotalaria juncea	30	Solanum scabrum	62
Crotalaria ochroleuca	31	Sorghum bicolor	13
Cucumis melo	8	Stylosanthes capitata	36
Cucumis sativus	46	Tagetes erecta	21
Daucus carota	46	Tagetes minuta	21
Eryngium foetidum	19	Tagetes patula	22
Fagopyrum esculentum	31	Tephrosia candida	25
Feoniculum vulgare	19	Tithonia rotundifolia	22
Flemingia macrophylla	23	Trichosanthes anguina	62
Glebionis coronaria	47	Vigna angularis	36
Glycine max	32	Vigna radiata	36
Gossypium hirsutum	32	Vigna umbellata	37
Guizotia abyssinica	26	Vigna unguiculata	38
Helianthus annuus	26	Vigna unguiculata subsp. sesquipedalis	63
Hibiscus acetosella	19	Zea mays var. everta	13
Hibiscus sabdariffa	47	Zea mays var. indurata	14
Impatiens balsamina	20	Zea mays var. saccharata	16
Indigofera zollingeriana syn. L. teysmannii	23	Zinnia elegans	22
Ipomoea alba	48		
Lablab purpureus	33		
Lablab purpureus	48		
Lactuca sativa	49		
Lagenaria siceraria	50		
Lepidium sativum	50		
Leucaena diversifolia	24		
Leucaena leucocephala	24		
Luffa acutangula	51		
Luffa aegyptiaca	51		
Macrotyloma uniflorum	33		
Momordica charantia	52		
Moringa oleifera	52		

Index by English Common Name

สารบัญตามชื่อสามัญ

Adzuki Bean	36	Moringa.....	52
African Marigold.....	21	Mung Bean	36
African Nightshade	62	Muskmelon.....	8
Angled Luffa.....	51	Mustard Greens	42
Asparagus.....	40	Naranjilla.....	62
Bitter Gourd.....	52	Nematicidal Marigold	21
Buckwheat.....	31	Niger Seed.....	26
Butterfly Pea	45	Okra.....	39
Calabash Gourd	50	Pak Choi / Bok Choy.....	43
Calendula.....	17	Papaya.....	8
Cape Gooseberry	9	Passionfruit	9
Carrot	46	Pearl Millet.....	34
Cassod Tree	25	Pigeon Pea.....	28
Chaya	45	Popcorn.....	13
Chia	12	Quinoa	11
Chickpea	30	Red Leucaena.....	24
Chili Pepper.....	44	Rice Bean	37
Chinese Kale	43	Rose Balsam	20
Choy Sum	43	Roselle.....	47
Coriander/Cilantro	18	Sawtooth Coriander.....	19
Cosmos	18	Sesame.....	27
Cosmos	18	Smooth Luffa	51
Cotton	32	Snake Gourd.....	62
Cowpea.....	38	Snow Pea.....	56
Cranberry Bean.....	35	Sorghum	13
Cranberry Hibiscus.....	19	Soybean	32
Crotalaria	31	Stylo.....	36
Cucumber.....	46	Sunflower.....	26
Dill.....	17	Sunn Hemp.....	30
Edible Chrysanthemum	47	Sweet Basil	20
Edible Leaf Solanum	57	Sweet Corn	16
Eggplant	60	Sword Bean	29
Ethiopian Kale.....	42	Tepary Bean.....	35
Fennel.....	19	Tobacco.....	20
Field Lablab.....	33	Tomato	58
Flemingia	23	Vegetable Amaranth	40
Flint Corn	14	Vegetable Lablab	48
Foxtail Millet.....	12	Velvet Bean.....	34
French Marigold	22	Wax Gourd / Wintermelon	41
Garden Cress.....	50	White Hoary Pea	25
Ghost Pepper	17	White Leucaena	24
Grain Amaranth.....	10	Winged Bean	57
Green Bean.....	55	Yam Bean, Jicama	53
Holy Basil	21	Yard Long Bean.....	63
Horse Gram	33	Zinna.....	22
Hummingbird Tree	25		
Inca Nut.....	27		
Indian Trumpet Flower.....	53		
Jack Bean.....	29		
Job's Tears	11		
Kidney Bean	56		
Large Indigo	23		
Lettuce.....	49		
Lima Bean	7		
Lima Bean	54		
Malabar Spinach.....	41		
Mexican Sunflower.....	22		
Moonflower	48		

Index by Thai Common Name

สารบัญตามชื่อสามัญไทย

กระเจียบเขียว.....	39	ถั่วหัวช้าง.....	30
กระเจียบแดง.....	47	ถั่วเหลือง.....	32
กระถินขาว.....	24	ถั่วอะซูกิ.....	36
กระถินแดง.....	24	ทานตะวันแม็กซิกัน.....	22
กลุ่มกิ่งแห้งแล้ง.....	68	เทียนแดง.....	50
กลุ่มฝักสวนครัว.....	69	โถงเทง.....	9
กลุ่มพืชสารอาหารสูง.....	66	น้ำเต้า.....	50
กลุ่มสมุนไพรและดอกไม้.....	65	บวบ.....	62
กลุ่มสลัดสวนครัว.....	67	บวบหอม.....	51
กะเพรา.....	21	บวบเหลี่ยม.....	51
ข้าวโพด/ข้าวสาลี.....	14	บักวีต.....	31
ข้าวโพดคั่ว.....	13	ปอเทือง.....	30
ข้าวโพดหวาน.....	16	ปอเทือง.....	31
ข้าวฟ่าง.....	13	ผักกวางตุ้งฮ่องเต้.....	43
ข้าวฟ่างหางกระรอก.....	12	ผักกาดกวางตุ้ง.....	43
ซีเหล็กบ้าน.....	25	ผักกาดเขียว.....	42
ครามป่า.....	25	ผักชีวัว/ผักตงโอ้.....	47
ครามใหญ่.....	23	ผักโขมผัก.....	40
ควินัว.....	11	ผักโขมเมล็ด.....	10
แครอต.....	46	ผักคะน้า.....	43
งาขาว/งาดำ.....	27	ผักคะน้าฝรั่ง.....	42
งาญี่ปุ่น.....	26	ผักชี.....	18
ชบาเมเปิ้ล.....	19	ผักชีฝรั่ง.....	19
ชามา.....	45	ผักชีล้อม.....	19
ดอกแคขาว.....	25	ผักชีลาว.....	17
ดอกชมจันทร์.....	48	ผักปลัง.....	41
ดอกดาวเรือง.....	21	ผักสลัด.....	49
ดอกดาวเรืองฝรั่งเศส.....	22	ผักหน่อไม้ฝรั่ง.....	40
ดอกดาวเรืองไส้เดือนฝอย.....	21	ฝ้าย.....	32
ดอกทานตะวัน.....	26	พริก.....	44
ดอกเทียน.....	20	พริกผีบ้า.....	17
ดอกบานชื่น.....	22	เพกา.....	53
ดอกปอกระเจา.....	18	ผักเขียว.....	41
ดอกปอกระเจา.....	18	มะเขือ.....	60
ดอกอัญชัญ.....	45	มะเขือกินใบ.....	57
ดาวเรืองหม้อ.....	17	มะเขือขม.....	62
แตงกวา.....	46	มะเขือเทศ.....	58
แตงลาย.....	8	มะระ.....	52
ถั่วขู.....	38	มะรุม.....	52
ถั่วขี้ม้า.....	33	มะละกอ.....	8
ถั่วเขียว.....	36	มะแว้งนก.....	62
ถั่วแขก.....	55	มะแฮะขึ้นนก.....	23
ถั่วแคเรนเบอร์.....	35	มันแกว.....	53
ถั่วดาบ.....	29	เมล็ดเขียว.....	12
ถั่วดาวอินคา.....	27	ยาสูบ.....	20
ถั่วแดงหลวง.....	56	ลูกเดือย.....	11
ถั่วเทปารี.....	35	เสาวรส.....	9
ถั่วแป.....	37	หญ้าไข่มุก.....	34
ถั่วแปบ.....	48	หมามุย.....	34
ถั่วแปะยี.....	33	โหระพา.....	20
ถั่วฝักยาว.....	63		
ถั่วพริ้ว.....	29		
ถั่วพู.....	57		
ถั่วมะแฮะ.....	28		
ถั่วราชมาษ.....	7		
ถั่วราชมาษ.....	54		
ถั่วลิ้นเตา.....	56		
ถั่วสไตโล.....	36		



echo
Hope Against Hunger

มูลนิธิเอคโค่ เอเชีย ประเทศไทย
ECHO Asia Thailand Foundation

159 Moo 2, Tambon, San Pa Pao, San Sai, Chiang Mai 50210 Thailand
+66 053 114-612 • echoasia@echocommunity.org
echocommunity.org/regions/Asia