global | breadfruit™

food security for a growing world

Guide to Growing Breadfruit

Our varieties are **not** genetically modified, but are traditional varieties chosen by the people of the Pacific over many thousands of years as they migrated from island to island. In consultation with the experts at the Breadfruit Institute, we have selected the best varieties out of the more than 120 varieties in the Institute's collection. Our commercial varieties were chosen based on their superior growth habit, adaptability, long fruiting seasons, and nutrient-rich fruit.

PLANTS PER ACRE (HECTARE)

The following ranges are the recommended number of plants per acre (hectare) of pruned and commercially managed trees, depending on variety:

35–48 plants per acre (87–119/hectare)

When planting, space the trunks of the breadfruit trees approximately **30–35 feet** (9–10.6 meters) apart.

PRIOR TO SHIPMENT

All trees are grown in an insect-free greenhouse on expanded metal benches. They are weaned from pathogen-indexed tissue cultured plants into a soil-free media that is sterilized peat moss/bark/perlite. The plants have never come in contact with the ground and are grown in clean greenhouses from the time they are deflasked until they are shipped.

The greenhouse they are sent from is certified Nematode-free by United States Department of Agriculture and Florida Department of Agriculture and Consumer Services. A USDA inspector will inspect the plants carefully and issue a phytosanitary certificate that certifies them free of any pathogens or pests named on an import permit.

SHIPPING

Depending on variety, the trees are shipped when they are between 4 and 12 inches tall (10–30cm). Our trees are shipped via airfreight to reach their destination as quickly and efficiently as possible. Neither FedEx nor UPS transport plants from the US to other countries so these familiar shipping methods are not possible.

Shipping charges are in addition to the cost of the trees and will be quoted prior to shipment to ensure the most direct and economical route is chosen.

ARRIVAL OF THE PLANTS

The most common cause of death for breadfruit plants is drying out. Remove them from the box when you receive them.

Water the trees from the bottom by setting them in a few inches of water to make sure they are thoroughly soaked throughout their root zone (15–20 minutes). Do not set them on soil or grass to avoid contamination with local pathogens, but allow them to drain on a table or on several layers of newspaper. Keep the plants out of direct sunlight. They have been grown under 50 percent shade and spent 2–3 days in a box; direct sun will burn the leaves. Make sure that they will be protected from direct sunlight at all times during the day, keeping in mind that the sun moves throughout the day and what appears as shade in the morning can be hot sun in the afternoon.

There is no need to remove side shoots or cut the plants back in any way. However, if some leaves are damaged and dead, the leaf stem can be carefully cut off with a knife. Be careful not to damage the trunk. Plants that are damaged and broken off will likely regrow from the base and should not be planted deeper than they were in the tray.

POTTING

Upon receiving the trees, they should immediately be potted in 1–2 gallon (4–8 liters) pots/bags using a high quality soil mix (never field soil) of composted bark, peat moss, or coconut coir that is specifically formulated for nursery crops. If you do not have access to commercially produced soil, please contact us for specific guidance on how to create your own.

PRIOR TO PLANTING

The plants need to be maintained in a nursery setting for 3–5 months until they large enough to withstand the elements and then can be planted in the ground. The plants should be kept in 50 percent shade for the first 3–4 weeks. After 3–4 weeks, the roots should have grown to the edge of the planting container and the tree can tolerate increased sunlight, but a minimum of 30 percent shade is required for the next 3–5 months.

WATERING

Once planted, breadfruit trees require regular and thorough watering during their establishment period, which is generally six months to one year. Optimal annual rainfall/irrigation is 59–118 inches (1,500–3,000 mm) but supplemental water may be necessary, especially in the first few years after planting if the dry season is unusually long or the plants show symptoms of stress such as lower-leaf drop or scorching of the outer margins of the leaves.

Prior to planting the trees in the ground (while it is still in a pot/bag) the tree should be watered in the early morning and checked again in mid-afternoon to ensure the soil has not dried out. If during the afternoon check, the soil is completely dry, water the plants again in the late afternoon. If the plant is not wilting and does not appear to be suffering from water stress, wait to water it until the following morning. Best watering practice suggests that the plants should not have wet leaves from manual irrigation during the night because this can promote the growth of disease organisms.

Most breadfruit mortality is due to the young plants drying out. Plants should be visibly inspected daily. It's much easier to see and correct potential problems if you're looking at the plants regularly than to have larger problems surprise the grower when they are difficult to correct. Almost all problems start slowly and on a few plants. Vigilant growers are always more successful and suffer far fewer losses than those who simply glance at the plants every day. The best groves will come from well-tended young plants that are carefully grown in their youth by an attentive grower.

FERTILIZER

Fertilizer is only a temporary solution to assist plant growth and will not solve a problem of poor soil with little organic material or bad drainage and inconsistent care. A constant commitment to improving soil structure through mulching, planting cover crops and the addition of organic material to revitalize the soil on a regular basis will guarantee your trees a long, healthy, and productive life.

GROWING IN POTS/BAGS

Fertilizer will encourage growth and should be used on the plants regularly while in containers. Fertilize the plants for the duration of their time in a container according to the type of fertilizer you are using:

Water-Soluble Fertilizer (20-20-20): twice per week at 200ppm.

Time-Release Fertilizer: follow the label instructions at the middle level.

GROWING IN AN ORCHARD

A small amount of fertilizer (of a low N-P-K ratio) is beneficial upon planting to assist with establishment, however, take care not to apply too much. Once planted in the ground they should be fertilized seasonally for the duration of their life with either a commercial granular fertilizer with aged organic matter or compost. We also recommend fertilizing each time the trees are pruned.

Planting a cover crop of legumes (plants that take nitrogen from the air and add it to the soil) can be very helpful to increasing the growth of the trees. This natural fertilization technique will increase the nitrogen composition of the soil, the main nutrient to support plant growth. Other nutrients can be added with chemical or organic fertilizers or with aged manure or compost. Compost teas are very good at both encouraging the plants to grow and in protecting the plants from pests and disease.

For more information on composting, visit **www.wikihow.com/compost**.

For compost tea information, visit **www.organicgardening.com/learn-and-grow/compost-tea** or **www.dep.state.pa.us/dep/deputate/airwaste/wm/recycle/tea/tea1.htm**.

PLANTING

After 3–5 months in a nursery setting, when the plants have roots that are well developed and hold the soil together when taken out of the pot, the trees are typically ready to be planted in the ground. During this time, the tree will be rapidly adding leaves and growing taller more quickly than it has in the past. The top of the tree will be approximately 12–18 inches (30–46 cm) above the top of the pot and exhibit multiple large, healthy leaves.

The trees should be spaced according to the plants per acre guidelines (page 1) and the holes to plant the trees should be twice as deep and twice as round as the potting container in which they were grown. Ideally, the soil used to plant the trees should be a mix of field soil and planting soil, compost, manure, or any other advantageous soil additive.

MULCHING

Mulching the trees after planting is highly recommended. Form a slight basin around each tree and mulch that area to ensure water is directed to the root zone and not lost to runoff.

PRUNING

We recommend that all fruit trees, including breadfruit, are pruned annually. Varieties like Ma'afala are naturally compact and need very little, if any, pruning until they have been in the ground for 4–5 years. Pruning breadfruit annually will help keep the trees the proper shape and good harvesting height, along with encouraging vigorous growth. If you would like shorter, more "bushy" trees with lateral branching you could begin pruning earlier. Trim the main leader, and other branch tips once the trees have reached 5–6 feet (1.5–2 meters) in height to encourage lateral branching. As with other nursery crops, regular pruning allows a grower to shape the plant to an optimal commercial height that will promote healthy growth as well as facilitate easy harvesting. Prune and fertilize after a major harvest to avoid a delay in fruiting.

FRUITING

Trees generally begin fruiting within 2–3 years from planting in a grove, and will reach optimal fruiting at the age of 5–6 years. With ideal care and attention, they can continue fruiting abundantly for 50 or more years. Some trees are known to continue fruiting for as many as 100 years.

Depending on the variety and local growing conditions, trees can produce anywhere from 175–250 fruits (200–350 pounds, 90–160 kilograms) over the course of the year during multiple harvests. Under optimal conditions, the trees can produce up to twice this amount, especially as they grow larger.

PESTS AND DISEASES

Pests and diseases to watch for include whiteflies, mealy bugs, snails and slugs, botrytis and mildews.

Slugs and snails can completely destroy many thousands of dollars of young trees overnight, so careful attention and treatment to guard against snails and slugs is suggested in advance of planting. Regular scouting under pots and under leaves in early morning will help detect these pests, therefore avoiding the devastation that they can inflict. Many effective commercial-grade slug and snail treatments are available to manage these pests. A clean growing area on gravel or concrete that is free of rotting vegetation, weeds and anything where these pests can hide will help protect your investment and help ensure high-quality plants. An ounce of prevention is worth many pounds of a cure and vigilance will always be rewarded with a much better crop.

Metaldehyde is the active ingredient in most commercial slug and snail control chemicals and the branded product SLUGGO(R) is an organic alternative that is sold in the US and Canada for control and is very effective.

Fungicides such as copper sulfate can help with fungal diseases or root diseases, though both are uncommon if the grower avoids stressing the plants from excess dry conditions.

Good air circulation is important for optimal plant health so ensuring that the plants are not spaced too closely and have room for air to move between them is critical to reduce the chance of disease. Sunlight and air are the best preventatives for foliar and fungal diseases.

At times, you may observe ants clustering near the shoot tip. The ants can be sprayed off with a hose.

Protection from grazing animals, such as goats, cows, or any other animal that could eat the young breadfruit tree, is essential.