

Pruning Breadfruit



Produced in partnership by the
University of Hawai'i at Mānoa College of
Tropical Agriculture and Human Resources
and Hawai'i 'Ulu Producers Cooperative



This document provides an overview of pruning best practices, strategies, and considerations for deciding when and how to prune your breadfruit tree. Pruning is the removal of unwanted growth in order to stimulate desired growth. Outcomes of effective pruning include controlling the size of the tree, improving structural strength, reducing maintenance costs, improving harvesting access and safety, increasing tree health and longevity, and improving productivity.

Categories of Pruning

Pruning increases fruit size and stimulates growth near the cut. Excessive pruning reduces fruiting for one or more years. Large cuts result in excessive stimulation of sprouts, while smaller, well-distributed cuts spread growth stimulation. The form and amount of pruning depends on factors such as: tree age, existing tree structure, cropping system, and the owner’s goals and purpose for pruning.

Initial Structural Pruning

Newly planted trees (6–15 feet tall) with only a central leader may be pruned back to about 3 feet or (1/3 of original height) to encourage lateral growth. The area cut should be brown and woody (not green or soft), slightly above the uppermost lateral branches desired, and cut at an angle. Pruning timing should be following fruiting and prior to a growing flush; February/March is likely a good time in Hawai‘i. To reduce weight and width of branch to be pruned, remove lower lateral branches above the planned cut site. This helps prevent the branch being removed from getting caught up and damaging other branches during pruning.



Maintenance Pruning

Always remove weak, damaged, or dead branches. Ongoing pruning should be used to control the height and shape of the tree, including removal of low-hanging branches. For optimal production, a pyramid shape (with the bottom wider than the top) should be promoted. Fruit crops are generally maintained at 12–18 feet.



Rejuvenating Pruning

Old trees may need to be drastically pruned to revitalize the trees. This can be a heavy cutback (“hat racking”), with a one- to three-year recovery time, or a moderate cutback of no more than 1/3 of the canopy over a period of several years.



Fruit thinning

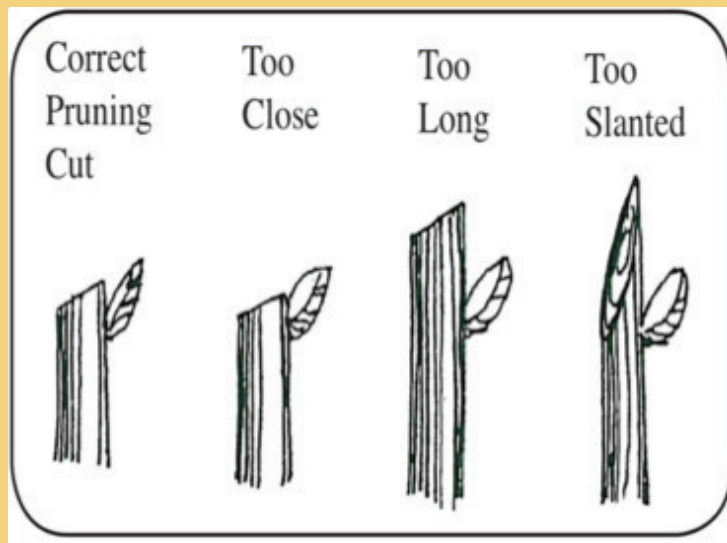
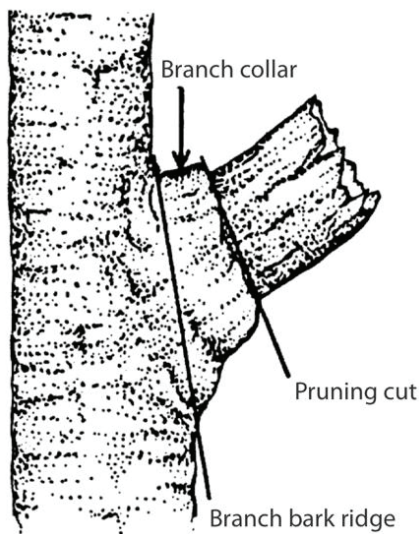
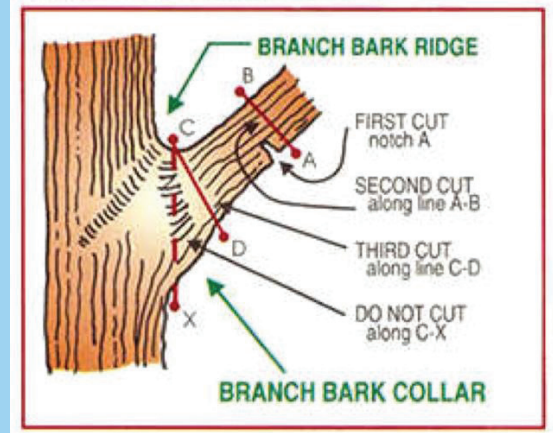
Remove young fruit to improve fruit size and reduce fruit abortion of the remaining fruit on trees that tend to overbear.



Know Your Cuts!

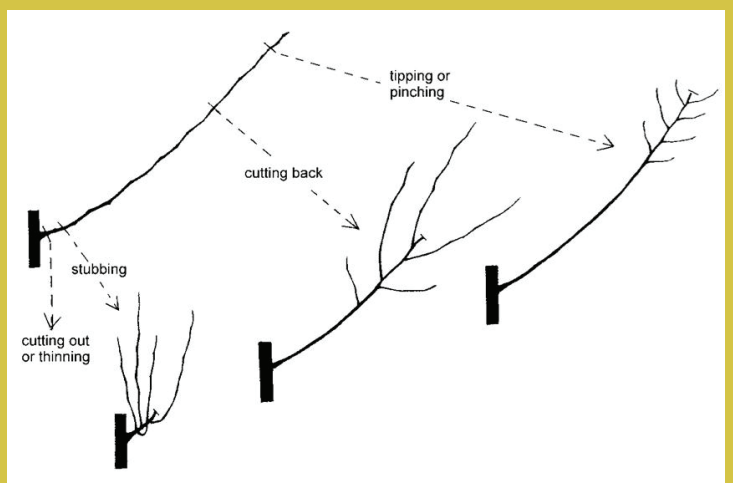
The most important aspect of thinning is making a clean cut that keeps the tree healthy. If the cut is made too far away the branch will re-sprout, and if it is made too close it may cause damage and rot in the tree. A healthy cut preserves the branch collar but does not leave any additional branch material past the collar.

When cutting a large branch, tree damage can occur if the branch is not cut correctly. The branch should first be undercut so that bark is not stripped by the falling branch. Branch should then be cut off long, so that the final cut is not made with the full weight of the branch. Finally, a clean cut should be made at the edge of the collar.



If making a cut to promote the growth of a branch or bud, it is important to cut at an appropriate distance and angle.

Know how different cuts will respond! Tipping or heading will produce many small branches at the tip. Cutting back will produce several larger, better-spaced branches. Stubbing will produce several closely spaced, upright branches. Thinning will eliminate the branch altogether.



Pruning Terminology

Knowing your trees and the different types of growth are important aspects of pruning. Broken or diseased branches should always be removed, as should crossing and rubbing branches and vertical water sprouts. Hangers are often undesirable, but may have a role in your tree.

Pruning Strategies

Central Leader

A central leader tree is one with a primary trunk. The tree can still be topped, but a new central leader is selected and cultivated. To reduce vertical growth, heading back lateral branches will encourage increased branch tips and lateral growth. Pictured is a tree with a central leader that was thinned and headed back. Notice the roughly pyramid shape and the wide crotch angles of the remaining lateral branches.

Multiple Leaders

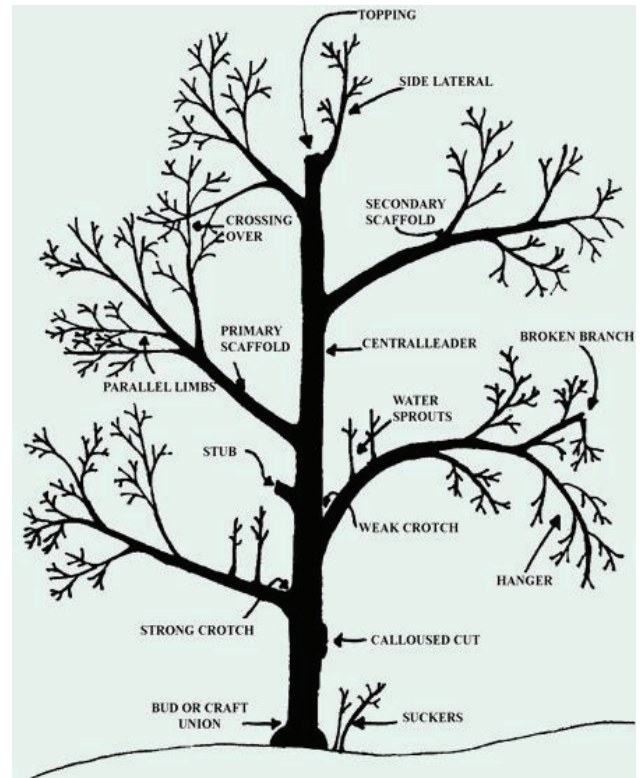
A multiple leader tree is one with several primary trunks. Trees are usually topped lower and four to six main branches identified and encouraged by thinning competing branches. Leaders will consistently attempt to turn vertical and should be directed outward by utilizing bench cuts to promote lateral growth of the leaders. Bench cuts remove upright shoots and open up the center of the tree to spread the branches outward.

Open Vase Pruning

Open vase pruning is a popular technique for many fruit trees such as mango and avocado. In breadfruit there are few examples, but it may be difficult due to rapid growth rates. Open vase pruning encourages many small branching tips, each supporting fruit development.

Hat Racking

“Hat racking” refers to pruning a tree such that it resembles a hat rack, with many bare branches. This is most often used to reclaim large trees that have not had regular pruning, but can be used as a standard approach. Trees will take two to four years to recover and fruit again, but may not need subsequent pruning for five years or more.



Mulching practices

Pruned branches can be used whole or chopped up for mulching. You usually do not want to mulch the same tree you prune from because of the potential for disease and pest harboring; it is best to use ‘ulu on a different tree and a different tree on ‘ulu.

Pruning Tools and Equipment

Always take care of your tools through proper maintenance such as sharpening between use, oil refills, and cleaning of debris. Clean and sterilize tools between cutting trees, especially in damp, disease-prone areas, to prevent spread of infection and cross-contamination. This can best be done with 70% alcohol. Wipe tools well with alcohol and allow to air dry. Take proper safety precautions for personal protection including wearing Personal Protective Equipment such as gloves, earplugs, helmets, eyeglasses, boots, and belts.

Handsaw



This is the best tool for breadfruit pruning, even on fairly large branches, as breadfruit wood is soft. Handsaws are appropriate for branches with diameters up to 6 inches. Handsaws are good to use with one hand while climbing. Pick a curved saw with sharp, even teeth, and be sure to clean it often so the teeth do not get gummed up.

Loppers



This tool is appropriate for smaller branches no larger than 2 inches in diameter you can reach by hand from the ground, or branches that fit comfortably inside the blade when fully open. Use loppers on branches within your reach without overextending your arms.

Pole Clip



This tool works like loppers on an extendable pole, and is also appropriate for smaller branches.

Machete



Use this tool for making mulch. Not ideal for clean, close cuts. Machetes should never be used for pruning.

Pole Saw



This tool is appropriate for smaller branches out of reach from the ground or by climbing with a handsaw. Pole saws are ideal for branches that may be too large for a pole clip; however, cuts may have less accuracy or be of lower quality.

Extension Chainsaw (chainsaw on pole)



In an orchard setting, use an extension chainsaw. This will allow for quick top pruning and shaping as you move from tree to tree down rows. This tool is great for out-of-reach larger branches (over 6 inches in diameter) that cannot be comfortably cut using a pole clip or pole saw.

Small Chainsaw



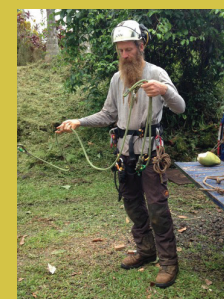
Chainsaws are ideal for large branches that cannot be cut using a hand tool. Use a chainsaw when the branches are within reach below eye level.

Sharpening Kits



Sharpen and check the chain on your saw often. Keep your blades sharp for best use and safety.

Ropes



Use ropes specifically designed for climbing, if climbing is needed during pruning.

Safety

Wear proper Personal Protective Equipment (PPE) when using tools and equipment while pruning and consider the following:

- **Have help while pruning**
- **Do not cut tall branches that are directly above you**
- **Watch safety videos about working with chainsaws**

Use the following as a checklist for proper PPE:

- Ear protection: do you have ear plugs if you are running a motor-powered tool?
- Helmet: proper chainsaw and pruning safety precaution to protect from falling branches and chainsaw kick back.
- Safety glasses: for protection against wood chips, throwing chains, and falling branches.
- Long-sleeved shirt: basic skin protection from tools, equipment, and contact with vegetation.
- Gloves: always wear gloves when using tools and equipment to protect your hands.
- Pants: always wear long pants when pruning or using tools and equipment.
- Boots/closed-toe shoes: Always wear boots or closed-toe shoes.

Safety tips for chainsaws: always wear all of your PPE. Never cut a branch over the top of your head. Never walk without the chainsaw brake on. Do not push the brake of your saw while the blade is still running. Do not leave your blade in the dirt. Keep your blade sharp by cleaning and sharpening after every three hours of use.



Precautions

Especially when pruning in wetter areas, leave about 2–4 inches above the desired cut to allow for die off. Note that this can vary based on the size and orientation of the branch.

In the case of a disease or infection at site, leave more room to come back and prune/trim during dry, hot months to make the cut clean.

If mulch will be moved off site, test for Little Fire Ants (LFA). This can be done by placing a dab of peanut butter on a stick and waiting a few minutes. Ants will flock to peanut butter and can be visually identified or sent to the Hawai'i Ant Lab for testing (littlefireant.com).

Safety Disclaimer: Those engaged in tree climbing must be adequately trained to perform all proper inspections, techniques, and take protective measures. Do NOT climb trees if you are not adequately trained, and hire an experienced arborist who follows proper safety protocols to help you with your 'ulu trees.

Guide to Demonstration Videos: Pruning How-To's

The following demonstrations were conducted by HUPC in spring 2018 with several of its farmer-members. We are all still learning about pruning 'ulu and welcome your thoughts and feedback. Hopefully these will be helpful for you!

You can access all of the videos cited below at <https://bit.ly/2RYDrLx>

Video 1: Initial Structural Pruning | <https://youtu.be/AxjYj9Au42w>

Description: Here we see two approaches to initial structural pruning, height reduction, and selective branch removal to allow for increased sun penetration through canopy. Conducted at HUPC member Mike Nakada's farm in February 2018, you will see 4-year-old Ma'afala trees that had never been pruned before.

- Pierre Moise Louis, eng. agronomist from Haiti, explains how to select smaller branches for removal and tend to broken branches. Pierre starts by first removing about 2 meters off the top of the tree at an angle to control the direction the branch falls in. He explains the importance of removing branches that are growing straight up to prevent the tree from growing too tall. Pierre gives a branch-by-branch tutorial on how to selectively remove branches from inside the canopy. He chooses to remove branches that block sunlight and/or will not produce fruit: they are small branches (about 7-inch diameter) that might stay the same for years without fruiting, but are taking up resources from the tree. It is not advised to cut all branches, as you can see Pierre will not cut two branches if they are in close proximity to each other.
- Hawai'i Island arborist Christopher Carter explains his pruning strategy using tide charts. Christopher finds that 'ulu trees have more sap during high tides. He uses tide charts to be prepared for days with lots of sap.



Video 2: Maintenance Pruning, Part 1 | <https://youtu.be/x-hZ8Hr6vlE>

Description: Arborist Trent Coffman explains his maintenance pruning approach and the importance of reducing light competition in fruit orchards. This video was created on HUPC member Jack Turner's farm with a 15-year-old Ma'afala tree.

- Trent describes his strategy of topping trees down to 18–12 feet in an orchard with other trees planted close by. His strategy is to take 10% off the top of a taller tree to be more accessible. The trees in this orchard started growing upward in response to competition from nearby trees. The second tree will be taken down to 12–15 feet. This tree had leads that were stretching up for more light; they will be taken down to re-branch for more accessibility. The next trees described are competing with mango trees that are blocking the sun. Trent will reduce the mango trees to 12–15 feet and reduce the 'ulu to 12–15 feet so the branches and fruit will stay lower and more accessible. He suggests not planting trees too close to reduce light competition.
- Note: Other farmers are practicing maintenance pruning down to 8 feet each year. In settings where trees are lower, regrowth is double each year. Suggested topping heights vary between farmer and arborist.



Before



After

Video 3: Maintenance Pruning, Part 2 | <https://youtu.be/8QSvADfuBMU>

Description: Arborist Christopher Carter describes a selective branch cutting approach and how to prevent bark from peeling and rotting by making undercuts on HUPC member Debbie Ward's 8-year-old Ma'afala tree.

- Chris shows which are good, smaller branches to remove from the tree to be turned into mulch. He also removes any branches that are rubbing each other or have rotten spots, since they may break or have smaller, unproductive fruit. Chris explains that rot can be created from making incorrect cuts; if you cut a heavier branch without making an undercut first, it may strip the bark and lead to rot on the tree.



Before



After

Video 4: Selective Branch Cutting - How to Select | <https://youtu.be/Bv651AsM2U4>

Description: Another maintenance pruning tree at Debbie's farm with 8-year-old Ma'afala varieties. Watch as arborist Chris Carter chooses which branches to remove in the canopy. Chris uses a handsaw to remove smaller, unproductive branches that are not bearing/will not bear fruit. He also removes an 'ulu sapling that has sprouted up from the ground that also requires energy from the tree.



Before (apical stem)



Before (knotty branches)



After (apical stem)



After (knotty branches)

Video 5: Rejuvenating Pruning | <https://youtu.be/ZAOpM5q86OI>

Description: Reducing height on a tall, 50-year-old Hawaiian 'Ulu tree at HUPC member Jack Turner's farm.

- Arborist Trent Coffman describes a 30-foot tree with vertical growth and canopy growing at the top that they will be reducing down to 6 feet on the front trunk and 8 feet on the rear trunk. The tree was previously pruned to 15 feet and the new fruiting pattern is starting to be apparent with more, accessible fruit growing lower on the tree. Their goal is to help lower branches become more established.



Before



After

Video 6: Reducing a Very Tall Tree | <https://youtu.be/VzOgZ3AWTV0>

Description: Watch an explanation of a tree height reduction on an over 50-year-old Hawaiian 'Ulu variety. Shot at HUPC member Debbie Ward's farm in April 2018.

- Arborist Chris Carter describes how he reduced the height of an ancient, very tall Hawaiian 'Ulu tree down to 15–20 feet with a chainsaw and a handsaw in Debbie's front yard to make harvesting fruit safer and more accessible. The fruit were too high up and now the tree will grow back healthy with accessible fruit. Chris notes that it was high tide and there was a lot of sap.

Videos 7 and 8: In-Progress Pruning

<https://youtu.be/3ZY67KDs-dA> | <https://youtu.be/2ztPp9a1bfk>

Description: More footage on Debbie's farm on how to select branches to improve sunlight. Watch arborist Chris Carter in action to get more familiar with the process.



Before



After

- Not sure which branches to select? Take a look as Chris tops and thins out a tall Hawaiian 'Ulu tree.
- See more about thinning branches to improve sunlight for 'ulu and other crops. Chris will go up in the tree to take out branches that have re-grown from the last pruning session.



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