

How to Espalier

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UC Marin Master Gardeners



Creating an espalier it not difficult, but it requires planning and attention to detail. Here are the basic steps:

- > **Choose a location**
- > **Choose a plant**
- > **Choose an espalier form**
- > **Create an espalier structure**
- > **Planting**
- > **Training & pruning for maintenance**

Choose a Location

Choosing the right location means paying attention to:

- The angle of the sun
- The amount of sunlight each day
- Soil drainage; and
- Proximity to other plants.

Sun Angle

As a general rule in Marin's Mediterranean climate, the ideal espalier structure runs from North to South. Its chief advantage is that it protects the plants from the harsh angle of the summer sun, especially in the afternoon. North-facing structures provide too little sunlight, and South-facing structures can create harsh growing environments in areas where the plant is in full-day sunlight and summer daytime temperatures regularly exceed 90 degrees.

Important exceptions that apply to a gardener's particular microclimate: The goal is to choose a location that provides as much sunlight as possible (see below), without subjecting the plant to the excessive glare and heat of the afternoon sun and to excessive wind. Thus, a Marin gardener who lives in an open and hot area may choose a North-South structure, while a Marin gardener who lives in a protected and cool area may choose a South-facing structure. The location decision requires careful consideration.

Amount of Sun

Fruit trees require at least six hours of sun each day. Less than six hours of sun severely compromises fruit set (production), increases the number of days necessary to bring the fruit to maturity, and fruit quality.

Soil Drainage

Make sure that the location provides good drainage. This is especially important for plants grown against walls, which may have foundations that promote unwanted pooling of water.

Proximity to Other Plants

Avoid locating support structures near large trees or shrubs whose roots may invade the espalier's root space. This condition may compromise the ability of the espaliered plants to obtain needed water, nutrients and space for their own roots.

Choose a Plant

Choosing the right plant means paying attention to four issues:

- The age of the plant;
- Ease of maintenance;

- Pollination; and
- Chilling hours (for most fruit trees).

Plant Age

Choose either a bareroot plant or a plant that is no older than one year. This permits a gardener to control the location of each new branch. If a plant is older than one year or already has heavily branched, it likely will need to be pruned to remove branches growing in undesirable locations or directions.

Ease of Maintenance

As discussed above, many types of plants can be espaliered but there are degrees of difficulty for each. For gardeners who are growing their first espalier, consider an apple or pear tree. These trees produce fruit on the same fruiting spurs year after year, allowing for easy maintenance of the espalier structure. Other fruit trees, including peaches, nectarines, apricots, cherries, figs and citrus can be grown in the espalier style, but proper annual pruning of these trees is more complicated than for apples or pears.

Pollination

Some fruit trees self-pollinate, but others do not. Most apple trees and some varieties of pear trees, for example, require cross-pollination for optimum fruit set. This means that the gardener must plant at least two different apple varieties or two different pear varieties that bloom at the same time in relatively close proximity to each other. It is best to check with the nursery from which the plants are purchased to make sure that the desired varieties are compatible.

While many varieties of peach, nectarine, pear, apricot, pomegranate, plum and cherry can self-pollinate, there are some that do not. Again, it is best to check with the nursery from which the plants are purchased.

As an alternative, many varieties of apples and pears can be grafted onto the same plant to provide for cross-pollination. While this solves the pollination issue, it can complicate maintenance, because some varieties are more vigorous than others, and the gardener must prune to encourage the growth of weaker varieties and limit the growth of stronger varieties.

Chilling Hours

Many fruit trees require a prescribed number of hours below 55 degrees Fahrenheit during the dormant season. These are called "chilling hours." Make sure to ask the nursery from which the plant is purchased whether the microclimate in your area will provide the necessary number of chilling hours. If not, the plant may break dormancy late, fail to properly blossom and fail to properly fruit.

Choose an Espalier Form

Espalier form and plant choice are closely intertwined. Many plants are suited for informal or free-form patterns, but only a few are suited to formal, symmetrical shapes. In general fruit trees can be trained to symmetrical patterns, but even fruit trees are easiest to train as fans or other patterns that more closely reflect their natural growth habits.

Create an Espalier Structure

Espalier fruit tree training: Building the structure

WOOD POST



Extend concrete above soil & mulch



Chain link top rail (hole saw to drill holes)

CHAIN LINK POST



Top rails, tension bands and turnbuckle

OR

Support wire from post



Support wire & turnbuckle attached to earth anchor



Turnbuckle



Earth anchor



Formal espaliers require structures both for support and for training branches. There are three basic espalier structures:

- Against a wall;
- Against a fence; and
- Between posts away from a wall or fence. This free-standing form can serve as a screen or, if paired with companion structures, as a means to grow a large number of plants in a confined space.

Be sure to build the structure before planting.

Whatever structure a gardener chooses, use metal or rot-resistant wood posts made from cypress, cedar, redwood, or pressure-treated lumber.

Structures against walls should be placed six to eight inches from the wall for several important reasons:

- The distance provides air circulation behind the plant and helps to prevent, mildew, staining and early decay of wood walls.
- The distance facilitates training (tying, pruning, etc.), spraying for pests, and maintenance of the building (e.g., painting).
- The distance creates interesting shadow patterns that add depth and interest to the espalier.

Freestanding structures should have both sturdy terminal posts anchored to the ground on either side and, if possible, strengthened with a horizontal metal or wood post placed between them.

Whatever structure a gardener chooses, it is important to follow these additional construction tips:

- Sink posts, especially wooden posts, in concrete that extends above the level of the soil and mulch;
- Use heavy gauge wire (12 or 14 gauge);
- Use eye screws and turnbuckles to properly align and tighten the wire; and
- Set and space the wires to reflect the chosen espalier form. For horizontal forms, the first level is typically 15-18 inches from the level of the soil. Additional levels are typically 12-18 inches apart.

Planting



Plant bare root plants with the graft union at least 2-4 inches above soil level.

After choosing a location, a pattern, and a plant and after building a support structure, the next step is plant installation. *This article assumes that planting will occur during the dormant season.*

Before starting

- Make sure that the soil at the base of any wall or fence is free of debris from its original construction. It may be necessary remove and replace any unsuitable soil.

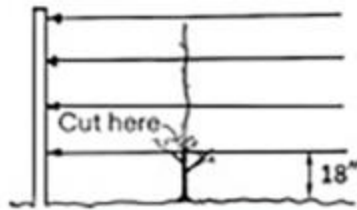
Preparing and planting

- Dig a hole at least twice the width of the root ball of the plant. For a **container plant**, the depth of the hole should be one to two inches less than the height of the root ball. For a **bare root plant**, the depth of the hole should be no more than is necessary to allow the plant to rest on the bottom of the hole with the graft union at least two to four inches above the soil level.
- Gently place the plant in the hole pointing the notch that protrudes from the graft union to the Northeast to minimize the possibility of sunburn.
- When done, the topmost root of a bare root plant should be one to two inches beneath the soil surface and, for both container and bare root plants, the soil line on the trunk should be one to two inches above the level of the surrounding soil. This method anticipates some settling of the soil in the hole and avoids water accumulation at the base of the trunk.
- Water thoroughly while planting to remove air pockets.
- Apply a layer of organic mulch two to three inches thick to conserve moisture and help to control weeds.
- Some gardeners also create a ring of mulch about 12 inches from the trunk to form a basin for adding water during the first season.

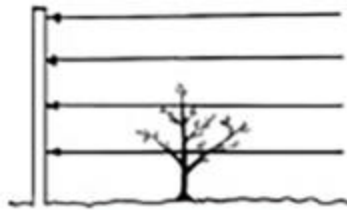
The weed-free and grass-free area around each plant should be three feet in diameter if possible, to avoid competition for water and nutrients.

If there is more than one plant in the espalier, plant them several feet apart. A distance of six to eight feet is recommended for fruit trees.

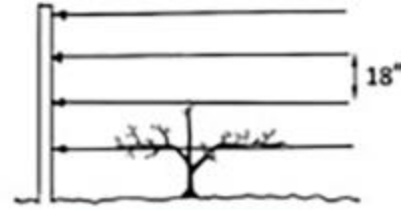
Training and Pruning to Maintain the Chosen Style



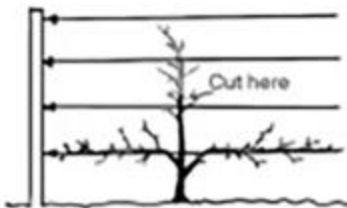
1. Once planted, cut bare root whip to about 15-18" high. Leave at least three buds below cut spaced evenly around.



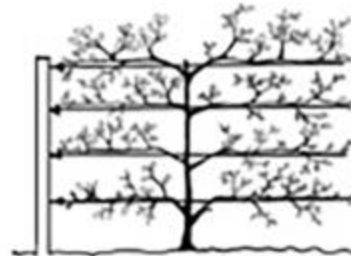
2. The first summer growing season, allow all buds to develop into longer shoots.



3. In Fall, choose the three best shoots evenly spaced around the whip. Cut off other shoots. Tie two of remaining shoots along the wire and let one grow straight up. Cut all three to about even length.



4. In winter dormancy, head plant back to second wire, just above three buds.



5. A minimum of four years of training is required to get an espalier to this height. Every dormant season, repeat steps 3-4 until you reach the desired height.

Cordon Style Training

The training technique used will depend on the pattern selected and the number of laterals on the plant.

Dominant main shoot

- If a gardener has chosen a pattern with a dominant main shoot, avoid cutting the top of the main shoot until it has reached the desired height.

Pronounced lateral growth

- Cut the main shoot one or two inches above the level of the first branching
- Make sure that there are at least three buds below this cut to generate the desired growth upwards (towards the next tier) and laterally (along the structural wire).
- Allow the new branches that emerge from those buds to grow all summer.
- In the fall, choose the most suitable branch to grow upwards to next tier, the most suitable branch growing to the left and the most suitable branch growing to the right. Remove the remaining branches. Carefully bend the left- and right-facing branches into position and tie them into place. Do not force the lateral branches downward. It may be necessary to lower them in stages, separated by two weeks.
- During the winter dormant period, cut upward-facing branch one or two inches above the next tier, again making sure that there are at least three buds below this cut. Do not

prune the left and right lateral branches, unless they have reached the end of their respective wires.

- Repeat this process until the plant has reached the highest level of the structure. At that point, head the upward-facing leader just above the top-most wire. Depending upon the number of levels, this could take several years.

To maintain an espalier

- Prune and tie new shoots to conform to the desired pattern.
- Remove branches that grow outward at right angles to the flat surface and those that grow beyond the boundaries of the desired pattern.

Prune plants at the same points in time that apply to full-size plants.

For fruit trees, it is especially important to prune both during the dormant season (for structure) and during the spring and summer (to control branches growing in undesirable directions or in a manner that crowds or shades other branches).

Protecting the Plant and Its Flowers or Fruit



To avoid sunburn, it is important to paint the trunk and main branches of the plant at the outset and after summer pruning with a 50-50 mix of white interior latex paint and water.



Shrouding with netting may be necessary for protection against insects, wildlife or inclement weather.

To protect the plants and the structure from insects, birds, small mammals and inclement weather, it may be necessary to shroud the structure or individual plants with netting or plastic sheeting.