

COMPANION PLANTING

A GUIDE TO CREATING POLY CULTURES IN COOL & WARM CLIMATES



An Introduction to Companion Planting

Companion planting is simply the act of planting more than one type of plant together in the same growing area. This is a key practice of organic gardening. It promotes biodiversity and makes farms and gardens more stable and sustainable over time.

Companion planting – or the creation of 'polycultures' - is an alternative to mono-crop gardening or farming, where large areas of one type of plant are grown, usually with extremely negative effects for humans, the local ecosystem, and the planet as a whole.



Companion planting is a good idea because it can help in creating a balance in natural systems. It can make it easier for gardeners or farmers to manage their food production, protect their soil, and create thriving, human-centric ecosystems in an organic way.

At its simplest, companion planting can involve intercropping an annual vegetable crop with a second plant type. At its most complex, it can involve creating guilds of perennial plants and building up entire, interdependent food forests.

Not all the ways in which plants interact with one another are fully understood. But organic gardeners or farmers can take advantage of a range of different beneficial interactions within an ecosystem when developing companion planting schemes.

How a Plant Can Help Other Plants Nearby:



Companion planting can aid the plants within the garden or farm ecosystem in a wide range of different ways. A plant in a polyculture can, for example:

- Improve the environmental conditions by providing shade, shelter, or other factors for its neighbours.
- Serve as a 'dynamic accumulator', gathering nutrients from the air or the deep sub-soil and making them available to other plants nearby through a number of different mechanisms.

(Dynamic accumulators include 'nitrogen fixing' plants such as legumes, and also plants with deep tap roots like comfrey, yarrow or even the humble dandelion.

The former can add nitrogen to the soil while growing through co-operation with symbiotic bacteria in their root nodules. The latter can bring nutrients up from deep below ground, and return these to the topsoil when chopped and dropped, allowing these nutrients to be taken up by nearby plants.)

- Serving to prevent disease or confuse, distract or repel common pests.
- Acting as a 'trap crop' – attracting pests to themselves so as to minimise the destruction of other more valuable plants nearby.
- Attracting pollinators to help pollinate nearby crops.
- Attracting other beneficial insects or other wildlife which will predate pests, helping to keep their numbers down and the ecosystem in balance.



Some plants are even said to improve the yield, vigour, or even the taste of their companions.

Of course, what is good for the plants is also good for the system as a whole, and for the person or people who are tending the growing area. Companion planting makes it easier for the gardener or farmer, since you will be working with nature to create something rather than fighting against it.

It can increase the amount of produce you can grow in a given area in a given time, and help gardeners or farmers to make the most of their growing area without resorting to polluting and harmful pesticides and herbicides. Creating polycultures is also a wonderful way to create a beautiful garden, with plenty of diverse sights, sounds and smells to enjoy.

Companion Planting in a Cool Climate



In a cool climate, the primary concerns of companion planting are shelter (from cold, wind, etc...), nutrient addition and pest and disease control. Choosing which plants to include in a mixed cool climate garden can be easy if you keep in mind at all times why you are placing plants together and what you hope to achieve. Remember there are no rigid rules – you can still have an orderly garden if you wish, or go for a more wild and free look...

Generally speaking, in cool climates, not getting enough sunlight is more of a problem than getting too much. Too much water is more frequently a concern than getting too little. While these are just general rules, they will mean that companion planting schemes in cooler climates will often look a little different to companion planting schemes in warmer locations. Overcrowding and dense planting can sometimes create problems for a cool climate since plants in the under-storeys of forest gardens, or lower plants in annual beds, can suffer from a lack of light.

As with everything in gardening, however, there are exceptions to these general rules. For example, in summer, even in a cool climate, leafy greens like spinach can benefit from shade, since they are prone to bolting if exposed to higher temperatures.

Generally speaking, when creating a complex polyculture in a cool climate garden, the general look and feel you should go for will be more akin to a woodland glade than to a dense jungle. For simple companion planting in annual vegetable beds, generally, aside from sometimes utilising different plants, the combinations will be more or less the same in any climate, with the same families of plants often being used.

Examples of Companion Planting for Shelter/Environmental Improvement:

A row of taller shrubs or trees can be used on the windward side of a vegetable bed in an exposed location to protect plants therein from strong winds. In a microcosm of a larger windbreak, taller, sturdy vegetable plants can be used to shelter more delicate salad crops.

Planting large kale or cabbage plants with lettuces and other salad leaves can be a good companion planting choice, not only because the larger kale or cabbage plants can shelter the smaller lettuce leaves from winds, and keep some of the sun off in summer to prevent the plants from bolting, but also because this combination allows you to make the most of time and space.

Kale and cabbage are slower growing than lettuce leaves and so the lettuce leaves will be harvested before the kale or cabbage needs the space and resources. The lettuce in between the other plants will help to reduce weeds and will make the most of the space at your disposal to grow as much food as possible.



In another example, a ground cover of smaller edible greens can be placed around larger winter crops to avoid bare soil and offer some shelter to the soil ecosystem that feeds and sustains plants over the winter months.

Examples of Companion Planting for Nutrient Addition:

In cooler climates, there are few large nitrogen fixers (trees such as laburnum are one exception), but plenty of nitrogen fixers that can be included in the shrub and herbaceous layers of a polyculture. For annual vegetable growers, legumes such as peas, broad beans, French beans and runner beans, are most definitely the most important nitrogen fixing plants.



Members of the cabbage family, and other leafy greens, need a lot of nitrogen to grow and will benefit from

having peas or beans placed nearby. Many other can also benefit from having nitrogen fixers nearby, though for some, there is some evidence that the nitrogen may be too much. Flowering or fruiting plants nearby might put on too much leafy growth to the detriment of the flowers or edible fruit of the plant.



Aside from nitrogen fixers, other dynamic accumulators also have an important role in cool climate companion planting. Comfrey, yarrow and borage, for example, are all commonly incorporated alongside perennial vegetables, trees and shrubs in polycultures and forest gardens. As well as being dynamic accumulators, and adding nutrients to the soil when chopped and dropped, these plants can also aid their companions in a range of other ways.

Examples of Companion Planting for Pest or Disease Control:



French Marigolds can be grown annually in a cool climate and make an excellent companion crop dotted throughout the whole garden, as a companion to annual vegetable crops and to perennials. French marigolds (*Tagetes patula*) produce a pesticidal chemical from their roots which will repel nematodes and other pests – even for a number of years after they are gone.



Like marigolds, borage is also an excellent companion for a wide range of edible plants. It can repel or distract a wide range of pest species and also attracts pollinators such as honey bees, and predatory insects.

A wide range of edible herbs also have beneficial properties in companion planting schemes due to their ability to repel/distract pests or attract beneficial insects. Some increase in efficacy if allowed to flower.

Alliums, because of their strong scent, are also common companion plants, repelling or distracting pests – such as carrot fly, when combined with carrots.

Examples of Companion Planting for Increased Yield/Quality:

There are also plenty of examples of plants for a cool climate which can increase the yield or quality of plants in the vicinity. For example, yarrow and chamomile are both said to increase the yield of essential oils if planted near certain edible herbs.

Inter-cropping of spinach and cauliflowers has been shown to increase yield on farmland in one study, and other inter-cropping studies have also shown increased yield after combining certain cool-climate plants.



Companion Planting in a Warm Climate



In a warm climate, the primary concerns of companion planting are shade (from the sun during the hottest times), water conservation, nutrient addition and pest and disease control. When planting for a warm climate, it is important to think carefully about time management, and to combine plants to facilitate year round growing, especially in areas where multiple harvests are possible.

Generally speaking, heat and drought conditions are the most common concerns in a warm climate – though in a tropical climate, the wet season can also bring its challenges. For this reason, creating shade is often of paramount importance. One of the benefits of a warmer climate is that plants in a companion planting scheme or polyculture can often be placed more closely and densely.

As always in gardening, however, there are exceptions to this general rule. While denser planting can often be a great way to increase yield in a warmer area, you may find that if you plant too densely, you will encounter problems with disease. The humidity levels where you live will have a large bearing on how closely plants should be spaced and what exactly you should and can grow where you live.

In areas with dry conditions, arid environments and sandy soil, creating mulches and growing biomass to improve the soil conditions will be crucial to gardening success. Certain companion plants can be chosen due to the fact that they are a fast-growing source of biomass, and can be chopped and dropped to add organic matter to the soil surface. A mulch of leaves and other organic matter can help to retain moisture and add nutrients to the soil.

Examples of Companion Planting for Shade & Water Conservation:

There are a great many examples of planting for shade and water conservation. Trees are, of course, a great source of shade for many plants. Forest gardening can be a form of food production suited to almost any part of the world, though perhaps the most abundant food forests are to be found in warmer locations, where many different, dense layers of productive and useful plants can be layered up to form a complex ecosystem.



In a vegetable plot, tomatoes give shade to herbs such as basil and oregano, while these herbs will also help to conserve water by covering the soil and add much needed humidity – for pepper plants, for example. Tomatoes and peppers are in the same family and grow well together, so these can form the heart of a polyculture which also includes the herbs mentioned above.

Examples of Companion Planting for Nutrient Addition:

Many different areas with warm climates have a range of nitrogen fixing plants which can be used to help add this essential nutrient to the soil. Often, placing nitrogen fixing trees or large shrubs can be one of the first stage in creating an organic garden or food forest. These plants are excellent companions for a wide range of other plants.

When it comes to a vegetable plot, legumes such as peas and beans are also often used. Useful legumes in warm climates include cow peas, runner beans, and a wide range of other warmth-loving beans. These can work well when grown alongside grains, or leafy plants with high nitrogen needs.

One common polyculture includes beans, alongside corn and squash or pumpkins. This is the 'three sisters' planting plan. The corn stands tall and provides support for climbing beans. The climbing beans add nitrogen, while the squash creates excellent ground cover helping to shade the soil and conserve water.



Examples of Companion Planting for Pest or Disease Control:

French marigolds are a wonder plant and can help your garden or farm to thrive when planted throughout the growing areas. Where these will not thrive, other marigolds can also be beneficial.

Nasturtiums are another useful companion flower, acting as a trap crop for aphids and deterring, for example, many of the common pests that attack cucumbers, squash, courgettes and other plants in the cucurbit family. What is more, they are also good at attracting a range of predatory insects.

As in a cool climate, a range of herbs and alliums also help to repel or confuse a wide range of pests

and to attract pollinators and other wildlife such as predatory insects. Many common culinary herbs can do extremely well in a warm climate, spreading to create beneficial ground cover as well as helping to control pests.

Studies have suggested that lemongrass may reduce the incidence of cutworm in aubergines, and this is one of many such interactions that is, as yet, only partially understood.

Examples of Companion Planting for Increased Yield/ Quality:

While largely anecdotal, it is said that planting basil near tomatoes can improve the taste of the fruits. Another example is that the herb, hyssop, may stimulate the growth of grapes and improve their yield. Again, this is a field that is not yet fully understood, so gardeners and farmers should experiment themselves to see what beneficial interactions they can find that seem to work where they live.



Whether they garden or farm in a cool climate or a warm one – no matter what the weather conditions are like – companion planting can help gardeners and farmers to garden organically, in a way that benefits them, and the planet.

About the Author

Meet Elizabeth Waddington

Elizabeth Waddington is a writer and green living consultant living in Scotland.

Permaculture and sustainability are at the heart of everything she does, from designing gardens and farms around the world, to inspiring and facilitating positive change for small companies and individuals.

Elizabeth also works on her own property, where she grows fruit and vegetables and keeps chickens and is working on the eco-renovation of an old, stone barn.

