



Garden workshop July 2015

Companion Planting



Nutrition

Soil Mates Companion Planting Garden Workshop

Introduction

Companion planting is the practice of planting different species together that benefit each other in one way or another. It is a practice that has been done for centuries and we would like to rediscover it with you!

There are many advantages to companion planting including pest control, improved growth, soil enhancement, and attracting pollinators. This means by the simple act of thoughtful planning you can eliminate the use of pesticides in the garden, grow more food, improve the taste of fruit and veggies, and insure your plants grow to their full potential.

A quite internet search will give you chart upon chart of who likes who and who doesn't. But sometimes its better to know the why the chart says so.

Chemical

Plants change the chemistry of the soil, and influence the types of microorganisms that grow there. Some will poison their neighbor's offspring to maintain a competitive advantage

Allelopathy is a biological phenomenon by which an organism produces one or more biochemicals that influence the growth, survival, and reproduction of other organisms. Commonly cited effects of allelopathy include reduced seed germination and seedling growth, nutrient uptake, photosynthesis,

Many plants have allelopathic effects including:

Marigolds, Walnut trees, Squash, sunflowers, Hot pepper, cucumber, fennel

- Marigolds produce thiophenes that deter nematodes in the soil.
- Walnut trees contain a compound toxic to many other plants, including most vegetables.

- Squash plants so successfully suppressing weeds in corn fields.
- Hot pepper has positive effects on radish and tomato, negative on lettuce
- Cucumbers are said to have allelopathic affects to some weeds
- Fennel is not friendly and is negatively allelopathic to most garden plants, inhibiting growth or causing them to bolt.

Nutrients

It is important to consider the depth of the root of each plant when companion planting. Alternate between deep and shallow rooted plant so your garden makes the best use of nutrients in all layers of the soil.

-Legumes change the soil **chemically** when they take nitrogen out of the air and fix it in the soil. For extra nitrogen plant peas, beans, clover, and alfalfa.

Beans are great for heavy nitrogen users like corn and grain plants because the nitrogen used up by the corn and grains are replaced at the end of the season when the bean plants die back.

Borage is a companion plant for tomatoes, squash, strawberries and most plants. Deters tomato hornworms and cabbage worms. One of the best bee and wasp attracting plants. Adds trace minerals to the soil and a good addition the compost pile. The leaves contain vitamin C and are rich in calcium, potassium and mineral salts.

-Comfrey It sends down long tap roots that can go as deep as 10 feet enabling it to accumulate minerals in its' leaves. These minerals include potassium, calcium, magnesium, iron and phosphorus along with vitamins A, C, and B-12. Excellent compost activator, foliage spray, nutrient miner. Comfrey is truly essential to all gardens.

Beets Good for adding minerals to the soil. The leaves are composed of 25% magnesium

Broccoli is a heavy-feeding plant, requiring large amounts of calcium for healthy crop production. Other heavy-feeding plants have the potential to negatively affect your broccoli crop. Heavy feeding crops include asparagus, cantaloupe, sweet corn, pumpkin and watermelon. Do not plant broccoli with these crops. Instead, pair broccoli with lighter feeders, such as nasturtiums and beets, which require very little calcium from the soil. Pair with beets who do not need as much.

Companion planting and insects

When planting you also have to take the insects in account. Many plants rely on insects for their pollination and many plants are eaten by insects. With companion planting you can discourage insects from eating certain plants by planting plants nearby to keep those insects away. You can also plant a catch crop to attract insects to certain plants which will keep them away from the plant you like to eat.

Ants - Help ventilate the soil, they fight caterpillars, fruit fly maggots, in China they used to string bamboo sticks between trees to make paths for the ants. Ants love the sweet dew from aphids that they

milk and they protect aphids from predators like ladybugs. Tansy, catnip, spearmint, lavender, sage, hyssop, geranium and pennyroyal will deter them from coming into your house. Spray the nests with garlic and white pepper

Cabbage butterfly - Cabbage is vulnerable to adverse weather or planting conditions. It is subject to club root caused by nematodes. This is why it should not be grown in the same spot every year. Rhubarb helps to control clubroot disease and marigold can help deter nematodes. They are also helped by planting aromatic plants close by, like celery, dill, chamomile, sage, peppermint, rosemary and onions. The Cabbage butterfly is a voracious eater and can be most destructive in a cabbage patch. Herbs that will help repel this butterfly are hyssop, rosemary, thyme and mint. Sage will work if carrots are planted nearby deter the cabbage butterfly and the carrot fly. Shaking pepper on the leaves will deter most caterpillars.

Centipede - Centipedes are very useful in the garden. They eat caterpillars, slugs and other pests. They also help break down decaying garden waste.

Fly - Some flies are natural cutworm predators. Most flies will lay eggs in your veggie patch and the maggots will ruin your crop. Mint and basil in your windowsill will help repel house flies.

Grasshopper - They will do little damage in small numbers but an infestation will eat almost everything. Garlic and onion sprays might help deter grasshoppers. Bait with molasses and rotting fruit might work.

Lacewing - Lacewings eat mites, caterpillars, black flies and other insects. Encourage these insects to live in your garden by planting flowers like sunflowers. The females need pollen in order to breed.

Ladybug - A ladybug is a useful insect to have in the garden. They have a good appetite for aphids and larva of many leaf eating insects. If needed you can even buy ladybugs and place them around the base of the infested plant. Place them low as their instinct tells them to climb. If you place them high up they will climb and fly off before eating. You can grow hyssop, mint, goldenrod, fennel, lambsquarters and sunflowers for the ladybugs. These are plants they like.

Mosquito - Basil, pennyroyal and mint will help repel mosquitoes.

Moth - Robins will eat the codling moth and ducks and chickens will help clean up the fruit that is fallen underneath fruit trees that is also the food for the caterpillars.

Spidermites - These tiny pests drain plant leaves and flowers from their juice. They like dry hot weather. Onion and garlic sprays are effective.

The following is a list of plants and the corresponding insects that they each help deter:

PLANT	REPELS/DETERS
Basil	flies, mosquitoes and carrot flies Asparagus beetles and whiteflies
Borage	repels tomato worm and cabbage worms, will attract bees
Catnip	ants, aphids, colorado potato beetle
Chamomile	flying insects

Chives	aphids and carrot flies
Clover	aphids and wireworms
Coriander	aphids, Colorado potato beetle and spider mites
Cosmos	the corn earworm (a moth larva)
Dill	aphids, spider mites
Fennel	aphids, slugs and snails
French marigold	repels whiteflies and kills nematodes
Garlic	aphids, carrot fly, snails, Mexican beetle and rabbits
Lavender	moths, fleas and mosquitoes
Leek	the carrot fly
Lemon balm	mosquitoes
Lettuce	the carrot fly
Narcissus	moles
Nasturtiums	white flies, aphids and many beetles
Onion	rabbits
Oregano	many pests
Parsley	the asparagus beetle
Peppermint	aphids
Radish	cabbage maggot and the cucumber beetle
Rosemary	carrot fly, snails and the Mexican bean beetle
Spearmint	fleas, moths, ants, rodents, beetles and aphids
Summer savory	bean beetles
Thyme	cabbage maggot, whiteflies, tomato worms
Tomato	the asparagus beetle
Tobacco	carrot fly and the flea beetle

Pests

There are many pests in the garden. Most of the insects have been previously mentioned in this booklet.

The three most useful plants in the garden for pest control are members of the allium family (like onions and garlic), marigolds and herbs like basil.

The ladybug is also of great value for pest control.

Aphids - Soft bodied plant lice, aphids like roses, strawberries, tomatoes, broccoli and sunflowers. They don't like tansy and chives. Planting orange and yellow nasturtiums next to plants you want to protect from aphids will be helpful as aphids fly over nasturtiums and consequently will not affect the plants close by. Ladybugs are the aphid's natural enemy. One ladybug can eat up to 400 aphids in a week. Coriander spray may fight off aphids. Use 2 tablespoons of freshly chopped leaves in 200 ml water. An alternative is to spray with a tea made with garlic, nettles, wormwood and basil.

Birds - Birds have traditionally been seen as pests by many gardeners. They can, on the other hand, be one of the best controllers of the insect populations. Many birds rely upon insects for about 50% of their diet.

Mexican bean beetle (looks like a ladybug but orange with black spots)- Potatoes planted next to beans help deter the Mexican bean beetle.

Colorado potato beetle (black and yellow stripes) - Beans help potatoes repel the Colorado potato beetle

Butterfly - It's larva, the caterpillar, will damage your crops, but butterflies will do little harm and will help pollinate plants. Butterflies like strong, sweet scents and bright colours. They prefer a warm, still and sheltered garden. The cabbage white butterfly is a rare butterfly that is a pest. Peppermint, sage and rosemary will repel them.

To deter caterpillars, plant a corner with caterpillar food, like nasturtiums, hollyhock, sunflowers and dill, so they might stay in one spot.

Cutworm - Cutworms eat right through stems of young seedlings, ruining the whole plant. They are well camouflaged. Interplanting marigolds, onions and tansy will help keep them away. If you have a problem you can make a mix of molasses and sawdust and put it around the seedlings. Cutworms will gorge themselves on this and will lie down on top of the soil and either die from the heat or be snapped up by a bird.

Earwig - The earwig can make a mess of the garden when there are many. On the positive side, they also eat small insects. If you want to remove them from your garden, you can cut up a piece of black hose. Earwigs like to seek shelter here. You can tip them out, away from the garden, when the hose is sufficiently full.

Mice - Mice are fond of eating tulip bulbs. They dislike garlic, catnip and spearmint, so plant these nearby.

Millipedes - Millipedes feast on leaf growth. A few in the garden will not be a problem as they also eat decaying plant material and aerate the soil. If the numbers are getting out of hand you can trap them in a small wire cage filled with pieces carrot and potato.

Nematode - They occur in great numbers and like to attack both the roots and the stems of many plants. They suck out the sap and inject poison that stunts the growth of the plant. Marigolds will help fight them. If you transplant clover you might be transplanting nematodes with it, so be aware.

Snails - Slugs and snails love tender cabbage leaves. To get rid of them you can use sharp grit or eggshells. A trap with stale beer or cider will work as well.

Rabbits - Onions and chives planted around the plants you like will help keep rabbits away. Another option is to sprinkle cayenne pepper on the ground.

Fungus rot - This is something that can happen to sweet peppers when you water them overhead. A strong tea of horsetail will combat this. Peppers and basil are good companions.

Tour through the garden

Amaranth - Has the highest iron content of any plant other than parsley. Contains vitamins A and C. Is deep rooting. Companion for field crops especially for improving compacted, eroded soil. By tapping into nutrients stored in deeper soil layers it helps nourish other plants. Good with onions, corn and potatoes. When it dies back it acts like a sponge mulch layer to make nutrient rich soil.

Asparagus - One of the best vegetables for protein (along with legumes and sunflower seeds) and a good source of fibre. Diuretic recommended for urinary tract infections. Tomatoes are good companions. The solanine in the tomatoes protects the asparagus from the asparagus beetle. Asparagus makes a substance called asparagin which helps to repel the nematodes from the tomatoes. If you have problems with the asparagus beetle there is one positive thing; next year the plant will have a higher number of quality stems. Tomatoes, asparagus, cabbage, marigold and beans side by side will be wonderful as each will repel its neighbour from its pest. Basil and parsley also seem to do well with asparagus.

Apple - High in vitamin C and high in pectin (protects body against radiation). They like clover at their feet, and this will improve the quality of stored apples. They don't like grass growing at their feet. Marigolds have an effect on the pest control. Nasturtiums will help repel aphids. If you have apple scab you can plant clumps of chives close to the trunk that is affected. Or spray chive and horsetail tea. If a tree does not do well and you want to plant another, always plant a different variety. Don't plant them near potatoes as they might get blight (Irish potato disease). Don't store apples with carrots or potatoes as the apples will give off ethylene gas that will give potatoes and carrots a bitter flavour and will not make them keep well.

Basil - Should not be planted near raspberries. It does not help the fruiting of the berries. Otherwise, basil is a most beneficial companion to most plants in the garden. Helps enhance the flavour of summer savory and helps tomatoes to be larger and more flavourful. It helps tomatoes with **whitefly, aphids and fruit flies**. You can also put a basil plant in a pot near an open window to keep the number of flies down. If you pinch the tops you encourage bushy growth.

Bean - Beans do well interplanted with carrots, cabbage, cucumber, cauliflower and beets. French or dwarf beans do well with potatoes and strawberries. Beans do well with leeks and celery, but they have to be a reasonable distance apart. Bush beans, snap beans and those types of beans do well with celery. All beans like growing with summer savory; it improves their flavour and size and it is good to cook them together as well. Corn is a good companion and makes a good windbreak, and beans can climb up the corn and put nutrient in the soil for the corn. Marigold will also help protect beans from beetle attacks. Beans do not like members of the onion family such as garlic, chives and shallots. They should also be kept away from fennel and gladioli. Beans are omnivores and love plants composted with pet or human hair and the content of the vacuum cleaner. They are able to fix the nitrogen in the soil.

Beetroot - Grows well near dwarf beans, lettuce and cabbage. Also a good companion to kohlrabi and onions. The onion, kohlrabi and beet all mine the soil at a different level, that is why these are good companions. Mustard and pole beans are not good companions.

Blueberry - Good companions for crops that are easily damaged by wind because they form a sturdy hedge. They do not grow well near blackberries or raspberries. A mulch of pine needles will be good for the blueberries.

Borage - This is a cucumber herb and **bees love these flowers**. Flowers can be candies, used for decoration and eaten in salads. It is a good companion plant for most plants. It is a good source of minerals (calcium and potassium). Good for strawberries and tomatoes, helping their growth and disease resistance. Repels tomato worms.

Broccoli - Prefers to be planted near members of its clan, like cabbages, Brussels sprouts, cauliflower and kale. It does well near potatoes, beetroot and onions, but should not be planted near tomatoes, strawberries or climbing beans. It helps if interplanted with herbs like dill, camomile, peppermint, sage or rosemary. Nasturtiums and marigolds might help with the nematodes that broccoli is susceptible to.

Brussels Sprouts - Strawberries will retard Brussels sprouts growth and do the same to broccoli. Aromatic herbs will repel the cabbage maggot (like peppermint or pennyroyal). Mustard can be used as a catch crop if you grow lots of Brussels sprouts. You can intercrop with peas or beans or fast growing lettuce like butter lettuce.

Buckwheat - A good companion to corn. It will grow in poor soil. It mines and stores large quantities of phosphate and calcium. Makes good green manure. Good bee attractant as well.

Bulbs - Narcissi or crocus do not require a companion plant, but for example, thyme and alyssum might help the ground stay lightly moist without being soggy, preventing rotting. Garlic and rhubarb leaf tea will help deter aphids that prey on the shoots.

Cabbage - Good companions are broccoli, Brussels sprouts, celery, chard, spinach and tomatoes. Tomatoes and celery repel cabbage worms. Cabbage does not grow well with strawberries

Carrots - Soybean crop before planting carrots will help break up the soil. Good companions are chives, lettuce, peas, radishes and tomatoes. Onion, leeks, rosemary, sage and wormwood will repel the carrot fly. Dill and fennel don't grow well with carrots.

Catnip - Bees are attracted to catnip, but mice and rats are repelled by it. A strong brew of catnip tea sprayed on the floor will send fleas and ants away.

Cauliflower - Good companions are basil, thyme, hyssop and sage. Strawberries and tomatoes will inhibit the growth of the cauliflower.

Celery - Good companions with leeks, tomatoes and dwarf bean. They all like the same soil and rich mulch like well composted pig manure. Aphids are the main pest for celery.

Chives - Good companions are apples, berries, carrots, grapes, peas, roses, tomatoes. Chives improve the flavor and growth of its companions and will deter aphids.

Chamomile - Chamomile is a good companion to cabbage and onions, improving the flavour in both. Insects will not breed in chamomile and it increases the growth of plants nearby. It has been called the plant doctor for these reasons.

Cherry - Planting catmint under a cherry tree might attract cats that will deter birds that like to eat the cherries. Cherry trees don't go well either plum trees or wheat. A root secretion given off by the cherry will suppress the growth of the two others. Cherry trees make potatoes planted nearby more susceptible to potato blight.

Clover - It is a companion plant to lawn or pasturing crops as it will nourish the grasses and help aerate the soil. It will help to add nitrogen. It is ideal for underneath apple trees as it enhances the flavour of the fruit and makes it store better. It will help deter the cabbage fly.

Comfrey - Comfrey is a plant healer and fertilizer. It brings up nitrogen. Comfrey tea will support the growth of leaves and green parts of the plants.

Coriander - Coriander loves to grow near dill. Fennel will cause coriander to wilt and coriander will prevent the fennel seed from germinating.

Cornflower - Cornflower has a beneficial effect on small grain crops like rye and wheat.

Corn - Companions to corn are beans, cucumbers, early potatoes, melons, peas, pumpkins, soybeans, squash. Soybeans deter chinch bugs.

Cucumbers - Companions to cucumbers are beans, cabbage, corn, lettuce, early potatoes, radishes, sunflowers. Late potatoes should be kept away from cucumbers as they encourage blight. The radishes will protect the cucumbers from the cucumber beetle. Cucumbers do not attract bees themselves so a bee attractant like lemon balm might be a good companion.

Dandelion - Dandelions will concentrate minerals and bring them up to the surface. This way they help to improve the topsoil. They also exhale ethylene gas that helps plants to mature and ripen early. Next to this they are natural hummus producers and will attract earthworms.

Dill - Good companions to dill are broccoli, Brussels sprouts, cabbage, cauliflower, cucumber, lettuce, onions. Fennel and dill may cross fertilize. The seeds go well together in food for cows and goats.

Fennel - Fennel should be planted a bit away from other vegetables as it has a harmful effect on caraway, tomatoes, beans, kohlrabi and coriander.

Garlic - Garlic is a good companion to cabbage, cane fruits, fruit trees, roses, tomatoes, beets and lettuce. Garlic and beans or peas do not go well together. A garlic oil spray deters onion flies, aphids, and ermine moths. A garlic tea helps repel late potato blight.

Goldenrod - Certain predatory insects like ladybugs, lacewings and hoverflies find goldenrod attractive.

Grapevine - Hyssop, chives and basil are good companions and radishes should not be planted near grapes.

Hazelnut - The leaves are beneficial to cows' digestive systems. They are hardy, but a burst of spring growth might attract aphids.

Horseradish - A good companion to potatoes. It will help make the potato more disease resistant. Also planted under apple trees it will help with brown rot, powdery mildew and other fungal diseases.

Hyssop - Hyssop will increase the yield of grapevines. It should not be planted near cabbages as it will attract cabbage white butterfly. If planted near radishes it will stunt their growth.

Jerusalem artichoke - They are undemanding companions and will not sap the soil of nutrients.

Kale - Kale is a good companion to aromatic herbs, buckwheat, cabbage family, marigolds, nasturtiums. Kale does not do well with strawberries.

Lavender - Caterpillars, mice and rabbits don't like the smell of lavender and bees are attracted to lavender.

Leek - Celery and onions are good companions. Beans and broccoli are not the best companions to leeks. As they are slow growing, interplanting with lettuce might help to keep the weeds down.

Lemonbalm - A great bee attractant and for this reason a good companion to cucumbers

Lettuce - A good companion to beets, carrots, parsnips, radishes, strawberries. Lettuce tenderizes summer radishes.

Lovage - Lovage is a strong aromatic herb, and will improve the health of other plants nearby. Lovage has an invigorating effect upon beans and sweet peppers.

Marigold - Marigold is a good companion to all garden crops. It stimulates vegetable growth and deters bean beetles, aphids, potato bugs, squash bugs, nematodes, and maggots. Plant freely throughout the garden. The marigolds you choose must be a scented variety for them to work. One downside is that marigolds do attract spider mites.

Marjoram - Marjoram is a good companion to all garden crops generally stimulating vegetable growth.

Mint - Mint will repel some pests, especially fleas and beetles. It will also repel flies and mosquitoes. Mint is a good companion for cabbages and tomatoes, helping them to repel cabbage worm butterfly and white flies for the tomatoes.

Mustard - Mustard seems to disinfect the soil and it will ward off snails, cutworms and nematodes. It is a great green manure and is a good companion for alfalfa cover crops, fruit trees, grapes and legumes.

Nasturtiums - These are a good companion for apples, beans, cabbage family, greenhouse crops, potatoes, pumpkins, radishes and squash. It repels aphids, potato bugs, squash bugs, striped pumpkin beetles, and Mexican bean beetles and destroys white flies in greenhouses.

Nettle - Nettles are good for the health of potatoes, tomatoes and horseradish.

Onions - Onions are good companions of beets, cabbage family, carrots, chamomile, lettuce and parsnips, but keep them away from beans and peas. They deter most pests, especially maggots.

Oregano - Oregano is a good companion to all garden crops. It deters many insects.

Parsley - Parsley is a good companion for corn, roses and tomatoes.

Parsnips - A good companion to onions and radishes. Onions help keep root maggots from parsnips.

Peas - Peas are good companions to beans, carrots, corn, cucumbers, early potatoes, radishes and turnips. Don't plant them near garlic leeks, onions or shallots.

Peppers - Peppers are good companions to basil, carrots, eggplant, onions, parsley and tomatoes. They don't do well near fennel.

Potatoes - Potatoes are good companions to basil, beans, cabbage family, corn, eggplant, flax, hemp, marigolds, peas, horseradish, strawberries, summer savory and squash. They don't do well near apples, birch, cherries, cucumbers, pumpkins, raspberries, sunflowers, tomatoes and walnuts.

Pumpkin - Good companions to pumpkins are corn, mint, beans and radishes. Potatoes should not be planted near pumpkins.

Radishes - Radishes are good companions to cucumbers, lettuce, melons, peas, nasturtiums, root crops and asparagus. Keep them away from hyssop. Radishes deter cucumber beetles. Chervil makes radishes hot. Lettuce helps make radishes tender. Nasturtiums improve radishes' flavor.

Raspberry - Raspberries do well with straw. Underplanting with yarrow might help deter some pests. Garlic and lavender are also good companions to raspberries. Don't grow them near potatoes as potatoes are then more susceptible to potato blight.

Rosemary - Rosemary is a good companion to beans, cabbage, sage and carrots. It repels bean beetles, cabbage moths and carrot flies.

Sage - A good companion to sage is cabbage family, carrots and tomatoes. Keep away from cucumbers.

Soybeans - Soybeans are good companions for corn and potatoes as they choke weeds and enrich soil.

Spinach - Spinach is a good companion for celery, cauliflower, eggplant and strawberries. They don't like to be planted near grape vines.

Strawberries - Strawberries are good companions for borage, bush beans, lettuce and spinach. They don't too well near the cabbage family. Planting lavender will help deter birds during the fruiting season.

Sunflowers - Sunflowers are good companions for cucumbers. Keep them away from potatoes. They can provide a trellis and shelter for shade-loving cucumbers.

Swiss Chard - Good companions for swiss chard are bush beans, kohlrabi and onions. Keep them away from pole beans.

Tarragon - Tarragon is a good companion to all garden crops and will improve the growth and flavour of vegetables. Especially beneficial to eggplant and sweet peppers.

Thyme - Thyme deters cabbage moths and can be planted near all garden crops.

Tomatoes - Tomatoes are good companions to asparagus. The solanine in the tomatoes protects the asparagus from the asparagus beetle. Asparagus also makes a substance called asparagin which helps to repel the nematodes from the tomatoes, basil, cabbage family, carrots, gooseberries, mustard, parsley, onions, rosemary, sage and stinging nettles. Keep them away from fennel, kohlrabi, potatoes and walnuts.

Zucchini - Good companions to zucchini are beans, mint, radishes and corn. Nasturtiums protect the zucchini from aphids.

Resources:

Wikipedia

Companion Planting by Pamela Allardice

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