One Planet Matters

Crop Rotation & Companion Planting

There is no single right or wrong way to do gardening. There are a few important things to think about regardless of what your method is, but after considering these things, there are lots of ways that you can plan your garden or allotment. In this info pack, we will introduce you to crop rotation and companion planting as gardening methods and considerations that we align to and often use.

When selecting plants and choosing where to plant them, we think about:

- **Soil pH -** growing plants with similar needs together.
- **Replenishing soil nutrients -** using cover crops, crop rotation, mulching, and composting.
- **Supporting biodiversity & encouraging pollinators -** through diversifying crops.

What is crop rotation?

Crop rotation is the practice of growing a particular plant in a different location in your garden each year, so that the plant layout of your growing area keeps moving around. There are a few different ways of doing this, including rotating all of the plants in each bed to another bed each year, or rotating plants individually and replanning each bed each year.

"To my mind, crop rotation is the single most important practice in a multiple-cropping program."
- Eliot Coleman, an iconic figure in organic farming

Why use crop rotation?

We can work to prevent the build-up of pests and diseases while ensuring that the soil has an ongoing input of beneficial nutrients through crop rotation. This is because different plant family groups tend to attract certain pests and diseases, as well as enriching the soil with different nutrients, and thriving in soil with different nutrients or pH levels.

Benefits of crop rotation:

- **Replace nutrients in the soil -** different plant families have different nutrient requirements, so if we plant the same type of plant year on year, eventually they will leave the soil stripped of the nutrients they need in order to thrive.
- **Prevent disease buildup -** different plant families are threatened by particular diseases which can be stored in the soil (soil-borne diseases). By changing the plants grown in each garden bed, you can disrupt the life cycle of certain diseases.
- **Reduce pests -** similarly to diseases which affect crops, different plant families attract different kinds of pests, and we can use crop rotation to disrupt their life cycles. If a crop creates a favourable condition for a certain pest to thrive in, we can change the location of that crop each year so that pests living in the soil do not have the long-term conditions they need in order to thrive.

It is not always necessary to rotate every crop in the growing area - the most important ones to rotate are heavy-feeders like tomatoes, broccoli and cabbage. See the table below to find out which other plants are heavy-feeders.

What is companion planting?

Companion planting is where we grow different types of plants together instead of growing one type of plant in each bed.

Benefits of companion planting:

- **Pollination -** different plants are pollinated by different types of insects, so we can grow plants that encourage those pollinators to the bed. For example, lavender and borage attract pollinating insects such as bees, butterflies, and hoverflies, which many edible plants are reliant on for pollination.

- **Pest control -** some plants deter certain pests, so are beneficial when grown beside plants that are susceptible to those pests. For example, nasturtiums attract caterpillars, so planting them with cabbages which are susceptible to being eaten by caterpillars is beneficial.

- **Flavour -** some plants enhance the flavour of other plants when grown beside them. For example, basil and tomatoes.

- **Efficiency -** companion planting uses small spaces efficiently, so it's perfect for urban gardens or space-limited gardens.

Companion planting tips:

- **Grow plants with similar care + soil requirements together**
  - e.g. basil and peppers
- **Grow fast-growing and slow-growing plants together to maximise space**
  - e.g. radishes or gem lettuce (fast growers) with squashes or melons (slow growers)
- **Keep plants prone to similar diseases apart, as the disease can easily travel between the plants**
  - e.g. tomatoes and potatoes are both susceptible to the same blight, and peppers and beans are both susceptible to anthracnose.
- **Keep plants that impede each others' growth away from each other**
  - e.g. do not plant peas with members of the Lily family (onions, chives, garlic, and shallots as they secrete chemical compounds which negatively affect peas. This means that you should avoid planting peas into soil where members of this family have grown previously too.
- **Plant flowers that attract pollinators next to veggies that need these pollinators**
  - E.g.borage attracts pollinators for squash, melons, and cucumbers.
- **Plant to improve the soil for future crops (rotational planting)**
  - e.g. beans and peas are "nitrogen fixers," meaning they leave nitrogen in the soil where they were grown or composted. After growing beans, plant nitrogen-lovers, including most leafy greens, leeks, garlic, and scallions.

How can I use companion planting and crop rotation together?

- Rotate companions as a set
- For example, we might grow garlic, spinach and peppers together, and rotate which bed these go in each year.

- Focus on soil fertility
- Make sure you are replenishing the nutrients in the soil each season.

- Prioritise rotating heavy-feeders

- Heavy-feeders are plants which use up a lot of mineral nutrients in the soil. For this reason, it is important to replenish these nutrients before replanting the same plants, otherwise your yields will reduce quickly.
- It is also a good idea to mix up heavy- and light-feeders in your beds, so that those beds are less depleted by the end of the growing season.

Heavy-feeders	**Heavy-givers**	**Light-feeders**
Most vegetables use a lot of nutrients in the soil - especially nitrogen, which is needed for leafy growth. • Broccoli • Cabbage • Brussels Sprouts • Cauliflower • Cucumber • Aubergine • Kale • Lettuce • Spinach • Pumpkin • Squash • Tomato • Beetroot • Potato	These plants are nitrogen-fixing, meaning they feed nitrogen back into the soil. • Peas • Beans	Some plants (especially root vegetables) don't use up much of the nutrients in the soil, allowing soil to rest before the heavy-feeders are planted next year. • Carrot • Celery • Coriander • Dill • Fennel • Parsley • Garlic • Leek • Mustard Greens • Onion • Parsnip • Shallot • Sweet Potato • Swiss Chard

Learn more:

General:

The complete book of vegetables, herbs & fruit by Matthew Briggs, Jekka McVicar & Bob Flowerdew (book)

Grow Food for Free: The easy, sustainable, zero-cost way to a plentiful harvest by Huw Richards (book)

Attracting Beneficial Bugs to Your Garden: A Natural Approach to Pest Control by Jessica Walliser (book)

Crop rotation:

Veg In One Bed by Huw Richards (book)

https://organicgrowersschool.org/gardeners/library/feeding-your-garden-organically/

https://deepgreenpermaculture.com/articles-and-reference-material/crop-rotation-systems-for-annual-vegetables/

https://cdn.dal.ca/content/dam/dalhousie/pdf/agriculture/ExtendedLearning/gardenbox/Crop%20Rotation%20and%20Companion%20Planting_Garden%20Box_Online.pdf

https://www.allotment-garden.org/crop-rotation/crop-rotation-plant-families-groups/

https://harvesttotable.com/vegetable_crop_rotation/

Companion planting:

Plant Partners: Science-Based Companion Planting Strategies for the Vegetable Garden by Jessica Walliser (book)

Companion Planting: Organic Gardening Tips and Tricks for Healthier, Happier Plants by Allison Greer (book)

https://www.almanac.com/companion-planting-chart-vegetables#

https://www.countryliving.com/gardening/news/g4188/companion-planting/

https://ag.umass.edu/home-lawn-garden/fact-sheets/companion-planting-in-vegetable-garden

https://www.swansonsnursery.com/blog/companion-planting-vegetable-gardening

http://www.kidsgardenclub.org/wfdata/frame119-1006/pressrel14.asp

https://botanic-garden.bristol.ac.uk/category/companion-planting/