Notes for the Gardening Club Meeting 4th February 2026

Companion Planting

The idea of companion planting has been around for a very long time. Bob Flowerdew quotes the Roman writer Virgil saying that it was an ancient practice when he was writing in 31 BC. Unsurprisingly, given its long history, it comes with a lot of superstitions and myths attached, with until recently no evidence to support its value. As a result of this many professional gardeners have regarded it as unscientific nonsense.

Now, with the benefit of recent agricultural research into the subject and with the aid of the internet to access this knowledge, we are beginning to see it as a useful technique to improve the garden and grow healthy plants and vegetable crops in a more sustainable way.

What is companion planting

Companion planting is defined as *"the growing of two or more plant species in close proximity, for the benefit of one or more of the plants involved". (Plant Partners p 12)*

Close proximity being difficult to clearly define. It can mean planting physically next to each other, in other cases planting in an adjacent bed, or just planting as many beneficial insect feeding plants as possible in the garden. It can also mean close proximity in time, as in crop rotation or when a green manure is used to provide nutrients for the benefit of the next crop to be planted.

What are the benefits of companion planting

1. **Improvements to soil fertility, or structure -** Using green manures to improve soil fertility, or using plants with large roots to break down heavy clay.

2. **Weeds can be reduced without the use of herbicides -** By using companion plants as a living mulch.

3. **A reduction in pest damage -** Companion plants can be used to deter pests by tricking, trapping, or luring them away from the main crop, they can also be used to attract and keep beneficial insects (ones that eat pests) in the garden in order to prevent future problems.

4. **A reduction in diseases -** This is not as well studied as other areas, but there is evidence that companion planting can help in preventing some fungal diseases.

5. **Improved pollination -** Using companion plants to increase the number of pollinators living in an area.

These benefits are discussed in turn over the following pages.

Improvements to soil fertility and structure

There are several ways in which companion planting can be used to improve soil health:-

1. **Green manures**

   Bob Flowerdew (*p 154)* recommends green manuring and crop rotation for improving soil fertility. Green manures improve soil fertility, reduce risk of soil erosion and they help to suppress weed growth.

   Recommended green manures to use over the Winter months, *(Plant Partners p 31-34* but check they are suitable for use in Aberdeenshire) are:-

   - Oats
   - Winter Rye
   - Winter Wheat

   Sow in late Summer early Autumn and cut down close to soil level when they reach the flowering stage, leaving the debris on the soil surface to rot down. **It is important that green manures do not set seed,** as they can very easily become weeds. After cutting down, wait between 2 to 4 weeks before planting any succeeding crop, to allow initial decomposition to take place.

2. **Nitrogen fixing**

   Nitrogen, which is needed for green leafy crops such as brassicas, lettuce, chard and spinach, can easily be leached from the soil by rain. It can be put back into the soil using nitrogen fixing plants, notably all legumes (i.e. members of the pea and bean family). Legumes, in association with a specialist bacteria, have the ability to take nitrogen from the air and transform it into a form in the soil that can be used by other plants. This is why in crop rotation peas and beans are always grown before green leafy crops. To help retain the nitrogen let the peas and beans die back naturally and do not disturb the soil when cutting down the redundant haulms to near soil level. Peas and beans can also share nitrogen with their neighbours during their life, using the soil microrhizal network. A 2010 study found that partnering potatoes with alternate rows of beans helped increase the potato yield *(Plant Partners p 38)*. Interplanting peas with lettuce can improve the yield and health of the lettuce *(Plant Partners p 41)*.

3. **Breaking up heavy soil**

   Plants suitable for breaking up heavy soils are:-

   - **Buckwheat** - which has roots that give out chemicals that encourage microbial action to improve the soil. Sow directly in May when all risk of frost is over. Water in the early stages. It only has a short growing season of roughly 8 to 10 weeks, before it should be cut down. **Note** it is said to strongly dislike waterlogging. (Allotment Hints and Tips on Facebook shows buckwheat being grown as a green manure in the Beech Grove region of Aberdeenshire).
   - **Turnip** - Some turnips have been bred to have long roots to break up heavy soils, eg the variety *"Appin"*. They are useful for no-dig as the roots will break up soils without damaging the soil micro-organisms. Sow directly in late Summer. The roots will be killed and start to break down in sharp Winter frosts of about -7℃; if the Winter is warm, mow the crop before it flowers to kill

the plants and leave the residue on the soil to break down naturally. Turnips are brassicas, so do not follow with a brassica crop.

Weeds can be reduced without the use of herbicides

Living mulches work by competing with and suppressing weeds, and by increasing the diversity of the garden; as a more diverse garden habitat (no matter how you create it) leads to an increase in the number of beneficial insects, makes plants less vulnerable to pest outbreaks, and improves the soil microbial and microrhizal networks. Also, any form of mulch will reduce soil erosion.

Living mulch plants could be interplanted between vegetable crops, or under planted below taller crops, or grown beneath trees in an orchard, or used to edge a bed, or grown in a path. In general it is best to pair plants together that like the same growing conditions and for ease of maintenance, it is also wise to pair annual plants with annual plants and perennial plants with perennial plants in a bed.

In the vegetable garden, to prevent competition with the main crop, living mulches need to be cut back regularly and they should not be allowed to set seed as they could rapidly become weeds. **Note** that cutting back could be a problem if they are growing between crop plants.

Examples of living mulches for the vegetable garden are:-

- **Red clover (Trifolium pratense)** grown close to or between cabbages, cauliflower, or squash plants *(Plant Partners p 55)*.
- **White clover (Trifolium repens)** grown close to or between strawberries or blueberries, or below tomatoes *(Plant Partners p 56-57)*.
- **Winter rye** is allelopathic (i.e. releases chemicals that suppress weeds) . It is said to work best when planted below veg that are transplanted such as brassicas or under perennial veg like asparagus. *(Plant Partners p 63)*.
  Note: Cucumbers are also allelopathic and autotoxic (i.e. they are capable of harming other cucumbers if planted too close to each other). Avoid planting anything grown from seed near to them. *(Plant Partners p 64)*.
- **Oats** are also allelopathic and can be used in a similar way to Winter rye.

Reduction in pest damage

There are several ways in which companion plants can be used to protect crops from unwanted pests. Examples are:-

- **Trap cropping** - Using plants to lure pests away, in order to keep pest damage down to manageable levels. It works best on insects that search out their food by scent and visual clues. The trap should be set up several weeks in advance of the crop to be protected.
  If the pests are mobile, traps should be close to the wilder peripheral areas of the garden where pests can over-winter. With the size of the trap reflecting the size of the pest problem.
  If the pests are entrenched, or not very mobile, (aphids, white fly, mites and flea beetles), traps need to be planted within the crop being protected or in rows adjacent to the crop. **It is important that pests are collected regularly from the trapping plants placed within or close to the crop**. Interestingly, Plant Partners *(p 101)* recommends the use of a wet/dry vacuum cleaner to do this.
  General advice is that it is important to use traps to target pests you know you have, otherwise concentrate on using companion planting to attract as many beneficial insects to your plot as possible.

  According to Plant Partners the following plants will help in either trapping, masking, or providing an alternative more attractive food source for pests:-

  Basil - for Trips on tomatoes *(p112)*
  Calendula - for Aphids *(p114)*
  French Marigolds - for Thrips *(p121)*
  Radish - for Flea beetle, (*p106)*

  I also made notes on these trap/ masking/ more attractive plants from my reading but failed to note the source:-

  Borage - for Cabbage white caterpillars
  Chives - for Aphids
  Nasturtiums - for Aphids, Black fly, White fly
  Nettles - for Aphids
  Chervil - for Slugs
  Sorrel - for Slugs and Snails

- **Masking and hiding crops** - Companion plants planted adjacent to or within crops to hide the crop from unwanted pests eating, or laying eggs on the crop.
  It is agreed that strong smelling herbs, such as Sage, Dill, Borage, Chamomile, Hyssop and Thyme can deter Cabbage White Butterflies from laying eggs. *(Plant Partners p117, though on p122 it* notes a living mulch of white clover is just as effective *)*. **Note that** Bob Flowerdew advises that perennial herbs (like Sage, Hyssop and Thyme) will deter pests but they are far too difficult to grow with vegetables *(p 135).*
  Alyssum can help deter carrot root fly from laying eggs (*Plant Partners p 126)*.
  French Marigolds can deter Onion Root Fly maggots and Cabbage Root Fly maggots (*Plant Partners p 121)*.
  Dill helps deter cabbage root fly from laying eggs (*Plant Partners p 116)*.
  Bob Flowerdew advises Tobacco Plants will tempt caterpillars away from tomatoes (*p 121)*.

- **Push-pull system** - A mixture of both masking plants in with the crop (push) and planting traps at a distance (pull). Was found to be more effective than using just one method (*Plant Partners p 108)*.

- **Impeding the movement of pests** - By forming a natural barrier to movement like a hedge; which will also provide a wind break, shelter for wildlife (including beneficial insects and predators) and help increase the diversity of plant life in the garden. And/or, by planting low growing cover plants to impede soil dwelling pests. This could be in the form of a living mulch, or planting low growing herbs or flowers, such as marjoram, thyme, or alyssum, which can obstruct access to the soil.

- **Enhancing natural pest predation -** Can be achieved by planting nectar rich flowers and creating a year round habitat in the garden, to provide plenty of food and shelter for beneficial insects. This should include sacrificial plants to serve as hosts to pests, to ensure a steady supply of food for the beneficial insects and guarantee that predators are there when you need them.
  Generally the greater the diversity within the garden, the more beneficial insects it will be able to support. Advice is to include plenty of flowering herbs, annuals and perennials, with a bias towards native plants which the insects are used to eating from. (*Plant Partners p 148)*
  Plants recommended are:-

  - Umbelifers such as dill, fennel, yarrow, angelica, achilleas and sedum spectabile.
  - Herbs such as mint, sage, marjoram, lemon balm, rosemary and thyme.
  - Nectar rich plants such as clover, cosmos, alyssum.
  - Hollow stemmed perennials for Winter habitat such as phlox, heliopsis and monarda.
  - Low growing plants, to provide shelter for spiders and beetles, such as oregano, marjoram, thyme, marigolds and alyssum.

  Bob Flowerdew recommends the annual Limnanthes douglasii (the poached egg plant), which will self seed, for feeding bees and hoverflies. Other plants he names for bringing hoverflies, the main predator of aphids, into the garden are:- Alyssum, Arabis, Aubretia, Hardy Geraniums, Goldenrod, Heliotrope, michaelmas daisies, all Mints, Muscari, Nemophilia, Nicotiana, Petunia, Phlox, all Poppies, Sedum spectabile, Shasta daisy, Stock, Sunflower, Sweet rocket, Sweet William, Sweet Wivelfield (a larger variant of Sweet William) and Wallflowers. Also later in the season Buckwheat and Convolvulus tricolor (Morning Glory). *(p 79)*

Reduction in diseases

This is a harder claim to prove. However, studies have shown that disease rates in plants are reduced when living mulches are used and their residue cut down and left to decompose on the soil surface. It is believed that this works because the mulch feeds the soil, leading to an improvement in the overall health of the soil, an increase in the soil's bacterial diversity and a reduction in the incidence of fungal disease.

Feeding the soil feeds beneficial microorganisms within the soil, and there is substantial evidence to show that microorganisms in the root zone can increase a plants ability to tolerate stress (such as heat stress, or drought), they can also fuel plant growth and suppress the development of diseases. Leaving the mulch on the surface of the soil will reduce the risk of soil splashes onto crops during watering or rain; soil splashes can bring soil borne fungal diseases into contact with the crop leaves and fruit. (*Plant Partners p 132)*. Along with crop rotation, living mulches are one of the best ways of preventing a build up of pathogens in the soil.

Examples of a living mulches for the vegetable garden that suppresses some of the soil borne fungal diseases are:-

- **Mustard greens (Brassica juncea)** are grown before a potato crop to help prevent potato scab; mustard greens release glucosinolates, which inhibit the organisms that cause scab. In this case it is **important** that the debris of the living mulch is incorporated into the soil, about three to four weeks before planting the potato crop *(Plant Partners p 136)*.

- **Hairy vetch (Vicia vilosa)** is grown before a tomato crop to help reduce soil borne fungal foliar diseases, such as early blight; and septoria leaf spot and improve yields. Sow in Autumn, as a Winter green mulch. Cut the plants down, when the first seed pods appear, and flatten down the plants on the soil surface so they are not incorporated into the soil. Plant the tomato crop directly through the dead vetch plants. *(Plant Partners p 138)*.

- **Winter wheat (Triticum aestivum) or Winter rye (Secale cereale)** can be grown before a bean crop to help manage fungal root rot. Sow in early Autumn, as a Winter green mulch. Mow down, when they start to flower, leaving the residue on the soil surface. Wait 2 to 4 weeks before planting the young bean plants directly through the residue. *(Plant Partners p 140)*.

Improved pollination

Bees play a major role in pollinating crops, so having a rich supply of bee friendly plants flowering throughout the year in the garden will have an impact on crop yields. As will the avoidance of using pesticides and the provision of nesting habitat.
As mentioned in the section about natural pest predators, the greater the diversity there is within the garden, the more bees it will be able to support, and the advice is the same - include plenty of flowering herbs, annuals and perennials, with a bias towards native plants.

References

Bob Flowerdew's Complete Book of Companion Gardening (Revised Edition)
By Bob Flowerdew
Published in 1999 by Kyle Cathie Ltd, London.

Plant Partners: Science-Based Companion Planting Strategies for the Vegetable Garden
By Jessica Walliser
Published in 2020 by Storey Publishing, Massachusetts.

Out of interest, because Plant Partners was written for American gardeners, I checked on the books relevance for Scottish gardeners on this web page:-
https://earthlymission.com/latitude-comparison-of-north-america-and-europe-north-africa/

It is no surprise that we are a lot further north, but given the current weather in North America it was quite a lesson in the value of the Atlantic weather systems in keeping western Europe warm and wet.