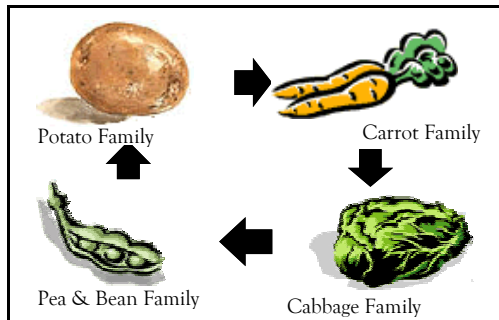


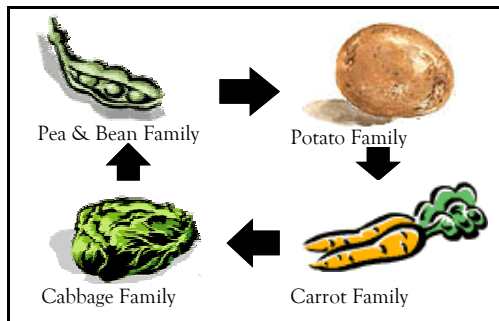
Crop Rotation

To help control pests and diseases it is a good idea to grow families of vegetables in separate plots and move them around (rotate) them each year.

Year 1



Year 2



This means that all the plants from the potato family would go in one area and all the plants from the carrot family in another as shown in the diagrams above.

Why use crop rotation?

- Moving crops around helps to stop the build up of pests and diseases, which are found in the soil.
- Plants need nutrients in different amounts and take them from different parts of the soil. Changing the crops in an area means that nutrients in all parts of soil are used.
- Families of vegetables often need similar nutrients (food). Keeping families together means that crops get the best growing conditions.
- Some plants have dense foliage (leaves which are close together and lots of them). These plants help to stop weeds growing. Changing from plants that do not have dense foliage, to those that do the next year, will help to keep the weeds down.

How long should the rotation last?

The longer the rotation the better, but the normal length is 4 years. The first 2 years of a 4 year rotation is shown opposite.

How do you plan a rotation?

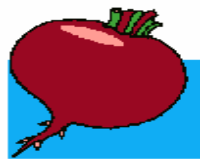
You can find examples of crop rotation in many gardening books. However, you can design your own by following these steps:

1. Make a list of all the vegetable types and number of plants that you want to grow.
2. Group the plants together in botanical families. The chart on the back of this leaflet shows you which plants belong in which families.
3. Draw a plan of the growing area. Divide into equal sections. You need as many sections as the number of years you want the rotation to last. So for a four year rotation you need four sections.
4. Work out which crops are going in which area. Families should be together, but if you have more than one crop for an area, then choose plants with similar growing needs.
5. Keep records—of what actually happens, not just what you planned. Use this information when planning for next year.

Vegetable Plant Families

Chenopodiaceae

- Beetroot family
- Beetroot
- Good King Henry
- Quinoa
- Spinach
- Swiss Chard
- Spinach Beet



Solanaceae

- Potato family
- Aubergine
- Pepper
- Potato
- Tomato



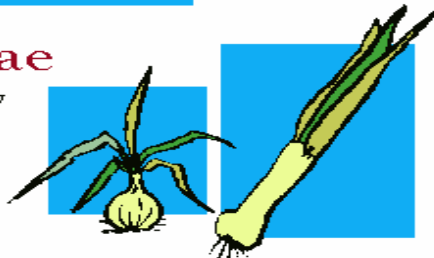
Umbelliferae (Apiaceae)

- Carrot family
- Carrot
- Celeriac
- Celery
- Fennel
- Parsley
- Parsnip



Alliaceae

- Onion family
- Garlic
- Leek
- Onion
- Shallot



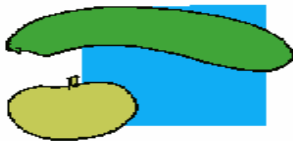
Miscellaneous

- Corn
- Lambs Lettuce
- Miners Lettuce
- New Zealand Spinach
- Purslane
- Phacelia
- Grazing Rye
- Buckwheat



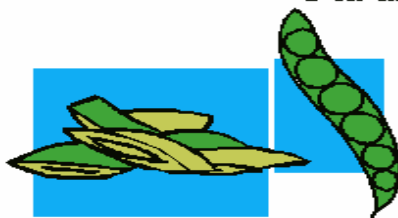
Cucurbitaceae

- Marrow family
- Cucumber
- Courgette
- Marrow
- Melon
- Pumpkin
- Squash



Leguminosae (Fabaceae)

- Pea and Bean family
- Alfalfa
- Broad Bean
- French Bean
- Runner Bean
- Clover
- Fenugreek
- Lupin
- Pea
- Tares
- Trefoil



Compositae (Asteraceae)

- Daisy family
- Chicory / Endive
- Jerusalem Artichoke
- Lettuce
- Salsify
- Scorzonera



Cruciferae (Brassicaceae)

- Cabbage family
- Broccoli
- Brussel Sprouts
- Cabbage
- Calabrese
- Cauliflower
- Kale
- Kohlrabi
- Mustard
- Oriental Brassicas
- Radish
- Swede
- Turnip



Crop Rotation



A student's guide
to planning
a crop rotation

Crop Rotation

If annual vegetable crops are grown in the same place year after year, there is a tendency for soil borne pests and diseases to become a problem, and for plant health and vigour to decline.

To avoid this it is good practice to move the crops around the growing area. This is known as rotation.

Why use rotation?

Pest and disease control

Plants which belong to the same family are grouped together when planning a rotation. Related crops are prone to the same soil-living pests and diseases. Moving them around in an organised rotation helps to prevent the build up of problems.

Nutrient requirements

Plants need nutrients in varying amounts and take them from different levels within the soil depending on the species and root depth. Varying the plants grown in a specific area helps to make best overall use of the soil.

Soil treatments

Crops vary in the soil treatments that they require. When a crop rotation is used, crops that require the same soil treatments are kept together as much as possible. This helps to ensure that they have the best possible growing conditions. It also means that over the course of the rotation the whole growing area will receive the same treatment.

Manure and compost—add these to greedy feeders such as potatoes, leeks, brassicas and marrows. Do not use on carrot, parsnip and beetroot.

Lime—if necessary to increase pH, add to cabbage family section in autumn before planting; this helps discourage clubroot. Keep away from potatoes, where it could encourage scab.

Leafmould—can be used anywhere, but particularly beneficial before root crops because it conditions the soil.

Weed control

Some plants have dense foliage like cabbage and lettuce, these are good at suppressing weeds because they stop light reaching the soil. Others, such as onion and carrot, do not.

Alternating plants with these different growth habits helps to keep weeds under control.

How long should the rotation be?

The longer the rotation the better, but the usual length is 4 years. This means that crops return to their original site after 4 years. If the soil is already infected with persistent problems such as eelworm or clubroot, try to extend the rotation of susceptible crops even further.



How do you plan a rotation?

Crop rotation may appear to be very complex, but once you start planning you will find that it is relatively straightforward. You will find examples of crop rotations in many gardening books. These tend to be based on standard British crops. Even if you grow other crops you can still plan an effective rotation. The following, outlines the basic principles of crop rotation:

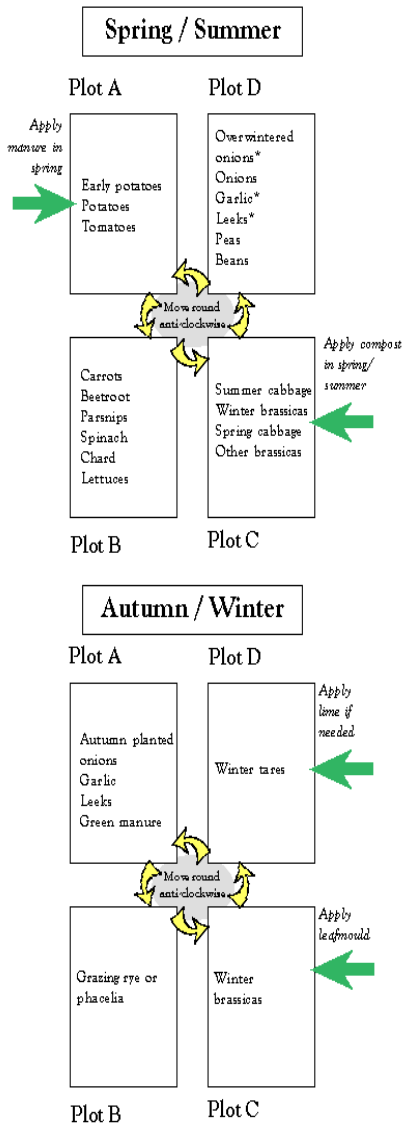
1. Make a list of all the vegetable types and quantities that you want to grow over a season.

2. Group plants together by botanical family. To find out which are related look at the table on the back of this leaflet.
3. Draw a plan of the growing area. Divide it into equal sized sections according to the number of years that you want the rotation to last. Try 4 to start with. Distribute the crops that you want to grow within these sections. The first rule is to try and keep families together; if a section is to hold more than one family, try and keep those with similar growing requirements together. Using a bed system can make this part of crop rotation easier.
4. You may find that it is difficult to divide your area up into 3 or 4 equal sized sections—the quantity of one type of vegetable might be too large. In this case reduce the amount of plants you are to grow rather than abandoning the rotation.
5. Be flexible. It is important to keep the major families together. Short term crops for example lettuce and other salads and early carrots and so on, can be fitted into any of your plots.
6. Keep records—of what actually happened, not just what you planned. Use this information when planning for the next year.

Further reading

- Green Manures for Organic Soil Improvement
- Garden Organic Guide booklet
- Beds—Labour-saving, space-saving, more productive gardening
- Pauline Pears, HDRA/Search Press 1992
- Soil Care and Management
—Jo Readman, HDRA/Search Press 1991
- The Vegetable Garden Displayed
- Joy Larkcom, RHS 1992
- Planning the Organic Vegetable Garden
- Dick Kitto (Thorsons 1986)

Example of a basic four year rotation



Other sample rotations

Plot A. Marrows, courgettes, pumpkins
Apply manure

Plot B. Peas and beans
Apply compost

Plot C. Cabbage family
Apply compost

Plot D. Root crops/onions
Apply leafmould

Plot A. New potatoes and tomatoes
Apply manure or compost

Plot B. Peas and beans

Plot C. Roots and onions
Apply leafmould

Plot D. Sweet corn and courgettes and pumpkins*
**May need compost if ground is poor*

Glasshouse

Tomato, peppers, aubergines

Cucumber, melons

To extend beyond 2 years, grow crops outside, or grow in pots in 3rd year. Bed released in 3rd year can be used for early outdoor crops, such as carrots, then winter salads.

NOTES

* = planted previous year

Crops and soil treatments move round beds, anticlockwise.

Some overlap will occur as new crops catch up with longer term ones eg over winter.

To reduce to 3 year rotation, with lots of potatoes, combine beds B & D

Vegetable Plant Families

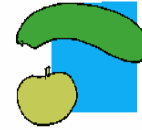
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- Spinach
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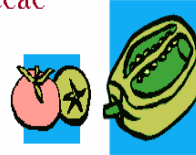
Cucurbitaceae

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- Cucumber
- Courgette
- Marrow
- Melon
- Pumpkin
- Squash



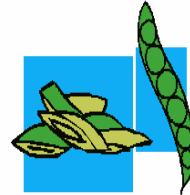
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Crop Rotation



A teacher's guide to planning a crop rotation



Garden Organic for Schools