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.

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.

Crop rotation—A Student’s Guide
Crop Rotation

A student’s guide to planning a crop rotation

Vegetable Plant Families

Chenopodiaceae
- Beetroot family
  - Beetroot
  - Good King Henry
  - Quinoa
  - Spinach
  - Swiss Chard
  - Spinach Root

Solanaceae
- Potato family
  - Aubergine
  - Pepper
  - Potato
  - Tomato

Umbelliferae (Apiaceae)
- Carrot family
  - Carrot
  - Celeriac
  - Celery
  - Fennel
  - Parsley
  - Tarragon

Alliaceae
- Onion family
  - Garlic
  - Leek
  - Onion
  - Shallot

Miscellaneous
- Corn
- Lutetia Lettuce
- Miners Lettuce
- New Zealand Spinach
- Purslane
- Placenta
- Grazing Rye
- Buckwheat

Cucurbitaceae
- Marrow family
  - Cucumber
  - Courgette
  - Muskmelon
  - Pumpkin
  - Squash

Leguminosae (Fabaceae)
- Pea and Bean family
  - Alfalfa
  - Broad Bean
  - French Bean
  - Runner Bean
  - Clover
  - Fava Bean
  - Lupin
  - Pea
  - Trash
  - Trefoil

Compositae (Asteraceae)
- Daisy family
  - Chives / Eadre
  - Jerusalem Artichoke
  - Lettuce
  - Salsify
  - Scorzonera

Cruciferae (Brassicaceae)
- Cabbage family
  - Broccoli
  - Brussel Sprouts
  - Cabbage
  - Calabrese
  - Cauliflower
  - Kale
  - Kohlrabi
  - Mustard
  - Oriental Brassicas
  - Radish
  - Swiss
  - Turnip

Garden Organic
for Schools
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.

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

**Spring / Summer**

<table>
<thead>
<tr>
<th>Plot A</th>
<th>Plot D</th>
</tr>
</thead>
</table>
| Early potatoes | Onion family *
| Potatoes | Onions | Beetroot family |
| *Seeded in spring* | *Seeded in spring* | Beetroots |
| Spinach | Spinach | Spinach |
| Chard | Chard | Cabbage family |
| *Seeded in autumn* | *Seeded in autumn* | Broccoli |

<table>
<thead>
<tr>
<th>Other sample rotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plot A: Marrows, courgettes, pumpkins</td>
</tr>
<tr>
<td>Plot B: Peas and beans</td>
</tr>
<tr>
<td>Plot C: Cabbage family</td>
</tr>
<tr>
<td>Plot D: Beetroot/leeks</td>
</tr>
</tbody>
</table>

**Autumn / Winter**

<table>
<thead>
<tr>
<th>Plot A</th>
<th>Plot D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autumn planted onions</td>
<td>Onion family</td>
</tr>
<tr>
<td>Garlic</td>
<td>Leeks</td>
</tr>
<tr>
<td>Leeks</td>
<td>Winter carrots</td>
</tr>
<tr>
<td>Winter leaves</td>
<td>Winter leaves</td>
</tr>
<tr>
<td>Winter turnip</td>
<td>Winter turnip</td>
</tr>
</tbody>
</table>

**Vegetable Plant Families**

- **Chenopodiaceae**
  - Beetroot family
  - Spinach family
  - Chard family

- **Cucurbitaceae**
  - Marrow family
  - Cucumbers
  - Muskmelon
  - Watermelon

- **Leguminosae (Fabaceae)**
  - Pea and Bean family
  - Alfalfa
  - Broad Beans
  - French Beans
  - Borago
  - Cleavers
  - Fenugreek
  - Lupins
  - Peas
  - Tares
  - Tephro

- **Umbelliferae (Apiaceae)**
  - Carrot family
  - Carrot
  - Celery
  - Fennel
  - Parsley
  - Parmley

- **Compositae (Asteraceae)**
  - Daisy family
  - Cornflowers
  - Jerusalem Artichoke
  - Lettuce
  - Solidago

- **Alliaceae**
  - Onion family
  - Garlic
  - Leek
  - Onion
  - Shallots

- **Cruciferae (Brassicaceae)**
  - Cabbage family
  - Chinese Cabbage
  - Broccoli
  - Cauliflower
  - Kale
  - Kohlrabi
  - Mustard
  - Oriental Brussels
  - Radish
  - Sisal
  - Turnip

- **Solanaceae**
  - Potato family
  - Potatoes
  - Tomato

- **Asteraceae**
  - Daisy family
  - Cornflowers
  - Jerusalem Artichoke
  - Lettuce
  - Solidago

**Notes**
- "Planted previous year:
- "Crops and soil transferred now ready beds, seedbeds.
- "Sowing date will be 3 to 4 weeks before the last frost date in spring.
- "Seedlings are ready to plant from 4 weeks after sowing.
- "Harvest: 10 weeks from sowing.

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A teacher’s guide to planning a crop rotation