

ORGANIC

organic farming technical summary



Successful Rotations on Small Organic Horticulture Units: Vegetable Cropping

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By definition, land area is limited on a small unit and a very high proportion may have to be used for cash crops if the unit is to be financially viable. However, this conflicts with the need for a significant proportion of fertility building crops in organic rotations. Organic standards make special provision for horticultural rotations but still require that reliance on external inputs is minimised and every effort made to introduce fertility building crops. Aim to ensure exploitative crops are efficiently grown releasing all possible land for fertility building crops.

- Seek more suitable land. Convert land from conventional production or rent organic land from owners uninterested in horticulture.
- Cut out cropping in excess of market needs, making land available for fertility building.
- Aim to improve low yields and cut out less profitable crops, releasing ground for fertility building. Consider buying in, rather than growing, crops grown on a farm scale such as carrots, onions and potatoes.
- Very valuable crops, such as some salads and possibly even flowers, could allow a viable business from a smaller area of exploitative cropping.

Pests and Diseases

- Inadequate rotation increases severity of some pests and diseases, particularly soil borne diseases such as clubroot.
- Ideally, only grow vegetables in each botanical family (Box 1) for one year in every five. This is essential, and may even be insufficient, for those families where disease problems are particularly pernicious (brassica clubroot and white rot of alliums).

Box 1

Botanical Families of Vegetables

Brassicacae:	Brussels sprout, cabbage, cauliflower, calabrese, turnip, swede, baby leaf (some types), radish Soil-borne diseases: clubroot.
Allium:	Leek, salad onion, bulb onion, chives. Soil-borne diseases: white rot.
Chenopodiaceae:	Beetroot, spinach, chard. Soil-borne diseases: violet root rot.
Compositae:	Lettuce, chicory, endive, radicchio. Soil-borne diseases: sclerotinia.
Cucurbitaceae:	Courgette.
Umbelliferae:	Parsnip, herbs (many), carrots. Soil-borne diseases: cavity spot (root crops), violet root rot, sclerotinia
Leguminosae:	Runner bean, broad bean, pea Soil-borne diseases: root and foot rots, sclerotinia.

Nutrient Supply

- Pay particular attention to nitrogen: many horticultural crops need large amounts (see Box 2).
- Carry out a nutrient budget to estimate the likely shortfall of nutrients by assessing inputs and off-takes of nitrogen, potassium and phosphorus over the rotation. Use permitted and restricted materials such as rock phosphate and sulphate of potash where necessary, and allowable under organic standards, to prevent deficiency.
- A meaningful proportion of nitrogen used in organic rotations should be 'fixed' by fertility building crops e.g. red clover. (Glasshouses have separate standards).
- Use winter cover crops (e.g. mustard) to 'trap' nitrogen which might otherwise be lost by leaching.
- Where necessary, supplement nitrogen levels with manures and composts but ensure all applications comply with organic standards.

Box 2

Nitrogen Requirements of Vegetables

High: **Brussels sprout, cabbage, cauliflower**, calabrese, leek.

Moderate: Beetroot, turnip, *swede*, salad onions, lettuce, courgette, *bulb onion, parsnip*, runner bean, herbs, baby leaf.

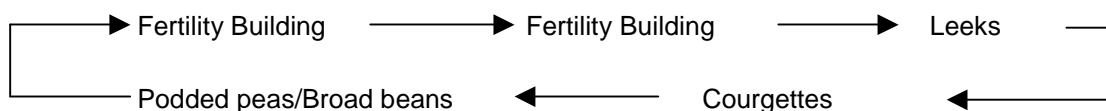
Low: *Carrot*, broad bean, peas, radish.

Crops in **bold**: caution - particularly difficult in organic cultivation.

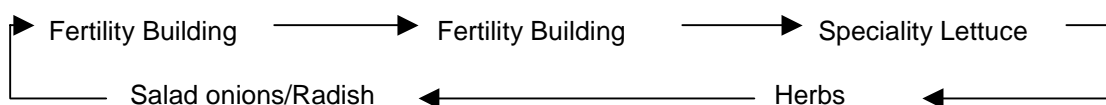
Crops in *italics*: field scale crops less suited to small units.

Suitable Rotations

- Rotational requirements to control pests and diseases are specific and easily followed. An inadequate rotation will initially cause problems with one crop and they will probably build from a low level allowing remedial action to be taken. Watch carefully for pest and disease build up.
- Designing a nutritionally effective rotation is much more difficult. Inevitably, this will be a compromise between what is desirable and what is practical. Rotations need to be robust to cope with varying weather conditions. Analyse soil regularly to check trends in nutrient levels. Always use the same laboratory to ensure consistency.
- In theory, a two year fertility building crop can be followed by up to three years of exploitative cropping using crops with reducing nitrogen demands (Box 2). There are, however, very few horticultural crops with low nitrogen requirements. Legumes (beans and peas) are an obvious choice but they are very labour intensive (resulting in competition from low labour cost countries), have limited demand (because of high price) and can be severely blemished in wet weather (possibly controllable with Spanish tunnels).
- Rotations must take into account other characteristics of the business. A holding using family labour to produce year round will require winter and summer crops, for example:



An intensive holding relying on summer student labour may not need any winter cropping, for example:



This cropping is highly labour intensive. Supplementary manure applications would probably be required before some of the herb crops and before salad onions but ensure the risks of microbial contamination of the crop are properly considered. In both rotations, winter cover crops should be used: after courgettes in the first example and between all exploitative crops in the second.

ACTION POINTS

- On small horticultural holdings land in the exploitative phase of organic rotations is scarce: never waste it!
- Consider the economic, labour, nutritional and biological requirements of rotations.
- Check performance and sustainability of rotations by measuring yields, soil nutrients and pest and disease incidence.

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Mark Sutton
Horticulture Adviser
SAC Perth
Riverview House
Riverview Business Park
Perth
PH2 8DF