

## INTRODUCTION

Wales has many advantages for field scale vegetable production such as plentiful rainfall, mild winters and slow maturity of crops in the cool summers. By selecting appropriate crops and growing systems, farmers can capitalise on these advantages and benefit by introducing vegetable production. In Wales, the market volume of fresh fruit, vegetables and potatoes is estimated to be nearly 500,000 tonnes with a farm gate value of £191 million. Potatoes account for 10% of this total, vegetables 44% and fruit 46%. Fruit and vegetables grown in Wales are estimated to account for 20% of the total Welsh market and the demand for locally grown produce is increasing.

## LAND AND SOILS

Vegetables have more particular requirements than most agricultural crops such as grass and cereals. Diversification into field vegetable production is only likely to succeed where land and soils are suitable. Soil analysis and an assessment of the suitability of the land for growing is a vital first step.

## VARIETIES

Crop varieties need to be chosen that will suit the system of cultivation on the farm, and that are suitable for local soils and weather.

## SYSTEMS

- It is important to work out the system of production and marketing as a priority. Problems such as pests and diseases need to be identified and control methods planned.
- Specialist and technical advice on conventional and organic growing systems is available from CALU and through Farming Connect and the Organic Conversion Information Service.

## MACHINERY AND EQUIPMENT

Specialist machinery is available for drilling, transplanting, harvesting and windrow composting. Irrigation systems are necessary for many field crops such as brassicas and salads. The extent of mechanisation will depend on the size of the farm business. Membership of Machinery Rings can overcome the need to invest in expensive kit.

## LABOUR

Even with mechanisation, field vegetable production can be labour intensive. Good management and a trained workforce are needed to produce and harvest quality crops. Sources of labour need to be identified before embarking on vegetable production – harvesting field crops may extend over many months and sufficient labour, equipment and transport must be available when required.

## FINANCIAL RETURNS

Yields, prices and costs tend to vary from year to year. Gross margins per hectare are variable and figures should be considered as a general guide only.

**Table 1: Indicative yields and gross margins for a selection of field vegetables**

	Carrots	Onions	Cabbage	Calabrese	Parsnips	Leeks
Yield (tonnes/ha)	52.5	35.0	32.5	9.5	25.0	20.0
Net price (£/tonne)	120	100	325	525	340	600
Gross Margin (£/ha)	1775	1225	2750	835	4550	3375

It is also important to remember when considering any diversification into field vegetables that on livestock farms any forage land put down to vegetables will lose Single Payment Scheme entitlement.

## MARKETING

- It is most important to identify market outlets before establishing a crop.
- Supplying the multiples is a specialised and technically demanding market. Specialist companies pre-pack vegetables for the supermarket trade.
- The only vegetable wholesale market in Wales is in Cardiff, but there are about 70 secondary wholesalers.

- Many smaller-scale growers market their produce directly at Farmers Markets or through box schemes.
- Caterers and the public sector are increasingly interested in sourcing locally grown vegetables.

## CROP DISEASES

Crop diseases arise from pathogenic micro-organisms that attack the plant.

Fungal diseases are the most prevalent but bacteria and viruses are also economically important. Disease control involves methods of prevention such as suitable site selection, good husbandry of the crop, observing strict hygiene and sanitation conditions, eliminating sources of disease where possible and using resistant varieties. Where diseases occur despite preventative methods, curative remedies include the use of biocides, biological controls, plant stimulants and conditioners. Correct diagnosis is important since it identifies the cause of the problem and should indicate why it occurred.

Blight caused by *Phytophthora infestans* is a major problem and CALU trials of resistant potato varieties and other methods of blight control are being undertaken on a number of sites in Wales. Blight mapping is a service from the British Potato Council it enables the industry to track blight outbreaks throughout the season. Link: <http://www.potato.org.uk/blight>

### Vegetable crops and their main diseases problems

	Club root
Brassicas	Downy mildew
	Ring spot
	Dark leaf spot
Broad beans	Rust
Carrot	Alternaria
	Cavity spot
Leeks	Rust
Lettuce	Downy mildew
	Grey mould
Onions	Downy mildew
	Neck rot
	White rot
Potato	Late blight
	Common scab
	Blackleg
	Black scurf
	Spraing
Peas	(Potato) blight
	Rust

## CROP PESTS

Most vegetables are host to insect pests that feed on the growing plant at some stage of their life cycle. Pests come from a range of families including Coleoptera (beetles), Diptera (true flies), Lepidoptera (butterflies and moths), Molluscs (slugs and snails) and Nematodes. The consequences of a pest attack range from a slight reduction in vigour to complete plant death - both result in reduced yields. Pests feed and reproduce on a range of crops. In some cases this is a narrow range, e.g. carrot fly which is a pest of carrot, celery, parsnip and parsley. Slugs on the other hand feed on almost any crop plant. Where a number of crops are grown, the range of potential pests is very wide making an integrated pest control programme vital. Pest attacks tend to be seasonal and vary with geographical region. Understanding timing can assist control. Growers can avoid generation peaks, harvest before damage occurs, protect crops by excluding pests with crop covers, or control them using chemical or biological controls. Pest insect forecasts, such as the Pest Bulletin are based on computer programs which use weather records to predict when pests are likely to colonise a crop or lay their eggs.

### Vegetable crop pests

#### Major pests

Cabbage root fly	Leather jackets
Potato cyst nematode	Slugs and snails
Vine weevils	Wire worms

#### Minor Pests

Bean seed flies	Carrot fly
Chafers	Colorado beetle
Cutworms	Free living nematodes
Lettuce root aphid	Lettuce root aphid
Onion fly	Millipedes & centipedes
Sumphlids	Swift moth
Wingless weevils	Turnip gall weevils

## THE FUTURE OF VEGETABLE PRODUCTION IN WALES

The *Horticulture Strategy for Wales* argued that there should be a strong market-led approach to development and identified opportunities for new entrants and for existing growers in new crops, new varieties and for specialisation, for example in organic horticulture where Wales has a strong reputation, and in the production and marketing of herbs and other nutraceuticals.