



NEW INNOVATIONS AND TECHNIQUES

INTRODUCTION:

Commercial horticulture in Wales is being driven by demand for new varieties and locally grown food. It has a strategic role in food security, healthy eating, plants for pollinators and tree stock for carbon capture. Advances in technology and new growing methods provide opportunities for horticulture businesses to improve their efficiency and increase their productivity, whereas online marketing and customer orders have now become the norm for many businesses.

Staying ahead of new innovations and techniques can be tricky for smaller businesses when time and resources are stretched. Common examples include:

HYDROPONICS AND PRECISION HORTICULTURE

When land and space for growing food is limited, for example nearby population centres, hydroponics is a method that enables plants to be grown indoors, giving growers control over lighting, water and nutrients required. This precise delivery optimises productivity whilst minimising the cost of the hydroponic cultures and avoiding excessive use of pesticides. Plants can also be propagated quickly and uniformly in artificial conditions.

A good introduction to Soilless Growing is available in the [Soils section](#).

PEST AND DISEASE MANAGEMENT

The control of pests and diseases is essential in producing quality plants and the science and technology surrounding this is growing rapidly. Chemical controls are becoming more expensive and less desirable due to their environmental damage. Integrated Pest and Disease Management using natural, bio-controls is becoming widely used in nurseries. Advances are also being made in disease diagnostics which enable targeted control measures. An example of this is the use of Lateral Flow Tests to detect Phytophthora species in plant infections.

A thorough introduction to this topic is available in the [Plant Health section](#).

DNA TECHNOLOGIES

Gene sequencing and other DNA techniques are developing rapidly through their application to human medicine. Similar techniques can be applied to plants and this developing technology will increase rapidly. Amongst the current techniques useful to horticulturists are gene detection techniques in which beneficial genes can be found early in the plant breeding cycle after hybridisation. If the desired genes can be recognised in young plants, rather than having to wait until the characteristic they produce (such as top fruit colour) is seen only when a tree is mature, the time to breed new varieties is significantly reduced.

AUTOMATION

Whilst being most applicable to large farms, robotic planting and harvesting and the use of drone -mounted cameras for crop monitoring, their development for a wider range of crops will help fill gaps left by labour shortages.



LIGHTING

As we learn more about the light requirements of plants in productivity and seasonality, we can use the advances in low energy lighting such as LED, to optimise the wavelength and duration of light for crops. The use of different wavelengths can also disrupt the flight of pests and reduce their multiplication in protected crops.

TRADITIONAL TECHNIQUES FOR COMMERCIAL USE

Soil erosion and compaction reduces crop productivity and increases the risk of production ceasing altogether in some areas. Knowledge is developing about the importance of soil organisms in the fertility of soils and nutrient balance. As soil is lost and artificial fertiliser costs rise, more traditional methods of market gardening, such as no-till horticulture, are being successfully refined for modern horticulture.

This Tyfu Cymru webinar has a useful introduction to [Small Farm composting](#) and no-till soil building

CONTENTS

Tyfu Cymru have developed useful resources under the following themes:

1. Seed crops
2. Vegetable, flower and fruit networks
3. Christmas Tree Network



1. SEED CROPS

Commercially available seed varieties must be included on a national list. Many traditional varieties that are not grown in large quantities are not listed and so are not widely available. These varieties are at risk from being lost from our genetic resources as well as being inaccessible to small-scale growers who may otherwise make use of their unique characteristics and suitability to local conditions.

The Heritage Seed Library and the Gaia Foundation have worked together to retain the seeds of these lesser-known varieties that they regularly grow-out and collect. When these varieties are being used by growers it is advantageous to save their own seed for future seasons.

Tyfu Cymru has developed the following resources, covering seed production and saving, collection from dry and wet-seeded crops and storage, as well as crop choice, pollination and plant isolation:

Webinars

- [Vegetable Seed Training Programme Webinar 1 – Seed Sovereignty](#)
- [Seed Training Programme – Webinar 1: Cultivation of simple crops for seed](#)
- [Seed Training Programme – Webinar 2: Cultivation of trickier crop for seed](#)
- [Seed Training Programme – Webinar 3: Selection of crops for seed](#)
- [Vegetable Seed Training Programme Webinar 5](#)
- [Vegetable Seed Training Programme Webinar 7 – Plant Selection 2](#)
- [Vegetable Seed Training Programme – Webinar 8 – Harvesting and cleaning your seed](#)
- [Vegetable Seed Training Programme – Webinar 9 – Managing and processing your seed](#)
- [Intermediate Seed Training – Session 10](#)

Factsheets

- [Seed cleaning and storage](#)
- [Seed cultivation – seed quality](#)
- [Planning for seed crops](#)
- [Plant Reproduction Toolkit](#)

2. VEGETABLE, FLOWER AND FRUIT NETWORKS

Innovation in crop production and efficiency measures can lead to improved quality. These often arise from discussions with growers themselves and through sharing knowledge with sector experts.

The resources below stem from the network sessions between the Vegetable, flower and fruit growers that were established by Tyfu Cymru. They include information on crop choice, planning and rotation and plant health through the growing year and how to farm using lean systems.



Webinars

- [Crop planning and rotations – field scale growing](#)
- [Crop planning and rotation – small growers](#)
- [Ben Hartman Webinar](#)
- [Nut Power Hour](#)
- [Asparagus, a diversification crop for Wales](#)
- [Flower Network- Starting Dahlias from tubers and cuttings](#)
- [Propagation methods and systems for ornamentals](#)
- [Cut flower production -extending the season](#)
- [The flower farmer's year](#)
- [Planning for the 2021 Season – soft fruit](#)
- [An introduction to commercial lavender production Video guides](#)

Video Guides

- [Inspection of new strawberry plants](#)
- [Planting of new strawberry plants](#)
- [Potting up new raspberry canes](#)
- [Setting up new potted raspberry canes Factsheets](#)

Factsheets

- [Vegetable Network Power Hour \(Technical Notes 22/04/2020\)](#)
- [Raspberry and Cane Fruit \(Technical Advice Sheet\)](#)
- [Strawberry and Raspberry \(Technical Advice Sheet May 2020\)](#)
- [Weed control in ornamentals \(Technical Advice Sheet\)](#)
- [Growing Sunflowers \(Technical Advice Sheet\)](#)
- [Growing Lavender \(Technical Advice Sheet\)](#)
- [Pumpkin planning and weed control \(Technical Advice Sheet – May\)](#)
- [Pumpkin Power Hour \(Technical Advice Sheet – June\)](#)
- [Notes from Pruning Workshop. Helios Orchard, Pool Hill, Gwent](#)
- [Growing cut flowers year round](#)
- [Should we say no to floral foam?](#)

3. CHRISTMAS TREE NETWORK

Christmas trees are an important crop for Wales as they can grow well on uplands and in a moist climate.

Techniques for the selection, growth and care of Christmas tree species are developing and, for the benefit of individual growers and the Welsh industry in general, it is important that growers discuss these methods and best practice.

Tyfu Cymru has formed a Christmas Tree Network of producers and this section gives the resources that have been produced for that Network on pests and diseases and pruning.

Factsheets

- [Christmas Tree \(Technical Advice Sheet: July\)](#)
- [Christmas Tree Network Study Visit: Technical Pruning Notes](#)



Notes

Every effort has been taken to ensure the information contained within this guide is accurate and current at the time of writing. We cannot take responsibility for links to external web-sites.

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