

INTRODUCTION

The production of small fruits has recently been the subject of much interest because of the suitability of many areas to produce these fruits and their health related benefits. These health related benefits result from the fact that many small fruits are rich in antioxidants (for example vitamin C) which have general anti-ageing effects including reducing the risk of heart disease. These crops may also be processed in various ways (for example as dried fruits) to extend the marketing season. Therefore the adaptability of these crops to growing in Wales, the diet related benefits and the potential added value of processing present good opportunities for production and marketing.

Traditional berry production has relied upon hand labour for harvest and has grown up in several areas of the U.K. the most notable of which is in Tayside in Scotland. This industry was based around the jam making industry in Dundee. Recent changes there have seen the enhancement of the fresh fruit market using protected cropping measures (usually plastic canopies erected over the crops). The traditional crops have been raspberries and strawberries. The industries have been assisted by The Scottish Crops Research Institute for plant breeding and support programmes.

Problems facing the industry have included low priced Eastern European competition and other fruit imports (for example Spanish strawberries). The U.K. specific specialist blackcurrant industry has been dominated by the processing industry leading to large contracts usually with a single supplier of a blackcurrant based drink. The industry has therefore sought to diversify in recent years with emphasis on near market production of quality fruits, protected cropping to extend season of production and diversification of the range of fruits produced. These forms of diversification may also represent an opportunity for Wales.



Fig 1: Blueberry in fruit

ALTERNATIVE BERRY CROPS

Berry crops suffer from a marketing disadvantage because they usually have a short shelf life and may require refrigerated transport. The fleshy berries, for example raspberries and strawberries, are best produced near to market while some berries have better travelling qualities. Table 1, while in no way exhaustive, gives some examples of berry crops.

Table1. Some berry crops suitable for production in Wales.

Name of Berry	Prospects
Blackberry and related berries, e.g. loganberry	Hard to pick but local market possibility, processing and mixed fruit processing
Raspberry	Fresh market and catering trade
Strawberry	Fresh market and catering trade
Currants (black, red and white)	Processing, some fresh market
Blueberry	Fresh market, drying, catering
Cranberry	Fresh market, drying, processing
Rowanberry	Processing for eating with game
Sea Buckthorn	Processing and flavouring
Elderberry	Beverages

SOURCING STOCK

Normally stock for fruit production will need to be free of limiting viruses. Certified stock is propagated from plants which have been raised at elevated temperature and shoot tips cultured to produce virus free stock. Thus some commercial fruits are normally only available from specialist suppliers. However, many alternative fruits do not have major virus problems. There are specialist companies in the UK producing strawberries, raspberries and blueberries. Cranberries and some type of blueberries may require North American sourcing while Rowan, elderberry and sea buckthorn may require either overseas sourcing or individual development of suitable productive lines. The rowan, elderberry and sea buckthorn have not yet been sufficiently developed in the U.K. to produce commercial quality varieties.

PRODUCTION SYSTEMS

Raspberry and Blackberry production. There are established systems for raspberry and blackberry production. These usually involve staking with support wires along rows and narrow tractor widths between rows for tillage purposes. Fruited wood is normally pruned out after fruiting. Irrigation and high organic matter usually improve berry yields. Harvesting is frequently by hand picking although machines have been developed for mechanical harvesting.

Currant bushes are usually grown in a grid pattern again allowing a small tractor width in one direction for tilling. Pruning is conducted to favour fruit bearing branches. Irrigation and high organic matter improve berry yields. There are three broad categories of currants – black, red or white currants. Hand picking is tedious and difficult to keep employees interested. Machine harvesting is possible but very large acreages are required.

Strawberries are commonly field grown with a mulch to minimise rotting where soil contact might occur. Recently strawberries are increasingly grown on raised benches in temporary polythene enclosures to ease picking (appropriate height) and minimise damage to fruit from soil contact. Plants are normally bought in and cropped once only in these structures prior to being discarded. Harvesting is normally by hand.

Blueberries are grown as either high bush or low bush varieties and normally an acid soil with good organic matter content is essential for production. Bushes are normally grown in rows. Harvesting is normally by hand picking.

Cranberry is grown in matted beds in acid conditions. Flooding is not essential to production but is an aid to harvest (floating off berries). Large acreage crops may also be machine harvested as dry berries or hand picked.

Rowanberry and **sea buckthorn** do not have a standard production system as they have not yet been fully developed as commercial crops in the U.K.. Rowan berry can only be hand harvested currently. The sea buckthorn does not normally pick cleanly. Some machines have been developed for harvesting but tend to be most suitable for berries for processing as some damage results.



Fig 2: Sea buckthorn in fruit

The problem of harvesting of small fruits is one of the most significant elements of production. The industry has been heavily reliant on hand picking but this work is exceptionally seasonal. Much berry production therefore depends upon casual labour availability which has often capitalised on school holiday and migrant worker support. Machine harvesting requires very large acreages and is unlikely to be justified for most of the small fruit crops and cropping situations likely to be encountered in Wales.

While costs are quite variable and not within the scope of this leaflet, it should be noted that lead times and thus return on capital might take some time. The highest establishment costs are likely to be for blueberries or Rowan which also will take longer to first harvest. Table 2 shows some approximations of time required to obtain satisfactory yielding crops of small berries.

Table 2. Typical times to first harvest for small berry crops.

Crop	Approximate time to first harvest
Blackberry and related berries	3 years
Raspberry	2+ years
Strawberry	Same season
Currants (black, red and white)	3 – 5 years
Blueberry	4 – 7 years
Cranberry	3 years
Rowanberry	8+ years
Sea Buckthorn	2 – 3 years
Elderberry	2 – 3 years

ENVIRONMENTAL CONDITIONS

Berry crops are not suited to windy conditions this is because the juicy nature of the fruit requires sheltered conditions. The shelter may be enhanced using modern windbreak materials (often green plastic mesh) mounted upon stout supports. Irrigation is usually desirable as complete crop losses are possible in dry seasons. Generally soils rich in organic matter are favourable for berry production not only for pH adjustment but also to improve soil texture and moisture regulation. Organic matter is usually applied as manure, composted material or peat. Many berries are liable to bird damage or loss and lightweight mesh enclosures may be necessary to protect fruit. None of the berry crops are likely to be successful where rabbits are present.

TIMING

Potential producers of berry crops should be aware of the seasonal nature of cropping and the need to sustain markets. Alternatively processing opportunities could be investigated to spread the marketing season. Processing allows the use of fruit which is of a lower quality than fresh market produce Table 3 gives approximations of natural cropping seasons for a broad range of small fruit crops..

Table 3. Cropping seasons of some small berry crops.

Crop	Season
Blackberry and related berries	Late summer / autumn
Raspberry	Late spring to autumn (variety dependent)
Strawberry	Early to mid summer
Currants (black, red and white)	Mid to late summer
Blueberry	Late summer
Cranberry	Late summer
Rowanberry	Late summer, autumn
Sea buckthorn	Late summer
Elderberry	Late summer

To overcome the limitations of normal cropping times, seasons are commonly being extended using protected cropping systems especially in raspberries and strawberries. These systems include production under plastic tunnels. Systems for the other crops are less well developed.

MARKETING

Small fruit crops represent several marketing risks. The first risk is that of competition, especially from Eastern Europe, and therefore added value should be investigated (e.g. processing, organic production or consumer preference for local production). The second risk is from market gluts and therefore season extension or processing could be investigated. The third risk is from crop perishability leading to total loss if the market is not met and receptive. A special note should be added for cranberry. In this case a large company dominates the market and therefore it is hard to compete except in local added value situations.

PROCESSING

Various forms of processing are possible, however some additional investment and development will be required to enter this market. Table 4 summarises some types of processing with the potential benefits.

Table 4. Some types of processing for small fruits.

Process	Benefits	Other considerations
Drying	Long shelf life	Processing plant required
Freeze drying	Indefinite shelf life	Expensive facilities required
Jams / jellies	Long term	Simple process
Beverages	Added value	Bottling plant needed
Confections	Added value	Catering link may help

Processing also offers the opportunities for collaborative ventures and marketing and will therefore spread the investment risk.

THE FUTURE OF SMALL FRUITS IN WALES

The fragmented land ownership in Wales has many small parcels of land suitable for berry production. It is unlikely that any very large scale production will take place over hundreds of contiguous acres, as in Tayside, but there are opportunities for diversification and especially for value added cropping. This concept fits well with the Horticulture Strategy for Wales which encourages crop diversification and added value benefits.