

Increasing the Vitamin C content of blackcurrants

Consistently higher Vitamin C content in blackcurrant juice would improve UK growers' competitiveness and contribute to better health

Benefits of research

Vitamin C (L-ascorbic acid or AsA) has been shown by many years of independent scientific research to benefit health and well being, both by itself and in combination with other plant antioxidants. In particular, it is known to provide protection against certain cancers and coronary heart disease and degenerative aspects of ageing.

Blackcurrant berries are renowned for their high AsA content and the area under cultivation in the UK has increased significantly over recent years in response to increasing demand both at home and in the rest of Europe. The principal market for berries is for juice production and growers currently supply 12,500 tons of berries to the major beverage manufacturer.

But, the AsA content of blackcurrant fruit varies enormously between varieties, seasons and location of production.

Raised and more consistent AsA content would improve blackcurrant juice quality and add

value to the crop making UK blackcurrant growers more competitive. It would also contribute to improving the nation's health.

Aims of the research

- To determine how, where and when AsA is made in the plant
- Define internal and external factors affecting berry AsA content

It is only recently that we have gained an understanding of how AsA is made in plants, but there is still much that needs to be explained about the process in blackcurrants. In particular, whether it is synthesised in the fruit or the leaves and why it declines in the fruit as they ripen.

- Identify agronomic practices that will optimise AsA crop yield

External factors such as climatic conditions, geographic location and plant nutrition are known to affect AsA content, but these effects need to be quantified.

- Develop strategies for maximising AsA production in commercial crops

The insights gained in the studies to meet the earlier aims will be

brought together in improved crop management systems which UK growers can use to enhance AsA production in blackcurrant fruit.

Research methods

Radiochemical tracers will be used to identify where AsA is made in blackcurrant bushes, when it is made, and how it moves within the plant.

A number of breeding lines produced by a variety of methods will be investigated for their AsA content and the most promising will be used in physiological and biochemical investigations, and incorporated into breeding programmes.



“We need to produce a better quality of blackcurrant, to maximise its health attributes”

Mike Dunsire
Sourcing Group Director,
GlaxoSmith Kline



SCOTTISH EXECUTIVE

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Using potted blackcurrant plants, the effects of a range of treatments on AsA content will be assessed. These will include:

- Light intensity
- Partial root drying
- Temperature
- Nitrogen fertilisation
- Crop load

New and historical data on yield and juice quality from a range of sites will be examined for consistent effects of geographical location and season on AsA content.

The information gathered from the detailed studies in the project will be brought together in trials on growers' holdings so that whole crop management systems can be tested

Benefits for industry

- Improved sustainability for the industry
- Improved crop scheduling
- Promotion of the health benefits of fruit
- A scientifically based grower blue-print for optimising AsA and fruit quality

A better understanding of AsA biochemistry and production in blackcurrants will also help in other crops where AsA content is important.



Laboratory dialysis techniques carried out at East Malling Research are helping to track Vitamin C in the fruit

LINK is a UK Government mechanism for supporting collaborative research partnership between UK industry and the research base.

The HortLink programme is currently open to bids to 2007. The aims of the programme are:

- To improve the sustainability of the horticultural industry
- To improve knowledge and understanding of processes and factors which determine the performance of the horticultural industry
- To enable access by the horticultural industry to innovative ideas and technology by involving a wide range of research institutes and university departments
- To promote wider industry awareness of the benefits of advanced horticultural techniques/methods.

Further information from the programme co-ordinator.

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“This project will capitalise on recent discoveries in basic science about how AsA is produced in plants”

Dr Robert Hancock
Scottish Crop Research Institute



Project details

Development of physiological, agronomical and genetic tools for increasing the L-ascorbic acid yield from blackcurrant bushes

Reference number

MRS/003/02

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