

Project title: Climatic effects on the vernalization and curd growth of winter cauliflower and subsequent fluctuations in supply

Project number: Hort195/ HL0131/ CSA4462/ FV212

Project Leader: Dr D C E Wurr

Annual Report: For 1999/2000, Cropping Year 2

Location of project: Cornwall, Devon, Lincolnshire, Kent and Warwickshire

Project co-ordinator: Mr Phillip Effingham

Date project began: 1 April 1998

## **CONTENTS**

<b>Practical Section for Growers</b>	<b>1</b>
Background, Scope and Objectives of Project	1
Summary of Results at the end of cropping year 2	1
Action points for growers	2
Practical and financial anticipated benefits	2

## **PRACTICAL SECTION FOR GROWERS**

### **Background, Scope and Objectives of Project**

Extremes of weather and effects of climate change have resulted in irregular production of winter cauliflower from UK crops with widely fluctuating volumes of product. Forecasts of production patterns are inaccurate, leading to uncertainty of UK supplies and reliance on imported crops. This often results in oversupply to the market with UK crops subsequently suffering in both volume and price.

Unless the prediction of the timing of winter cauliflower is substantially improved it is likely that the gains made in import substitution over the last few years will be lost. There is an urgent need for information indicating the overall pattern of supply of winter cauliflower throughout the production season. This will allow more rational marketing and enhance the competitive position of the industry. The proportion of the market supplied by UK producers will be maximised. This project aims to understand how weather conditions influence the initiation and growth of winter cauliflower curds. It will assess the timing of maturity of the whole range of genotypes used in winter cauliflower production relative to the varieties sampled in detail and determine the effect of frost during curd growth on curd quality at maturity.

Its objective is to develop a predictive system to indicate when, and in what quantity, the UK winter cauliflower industry can supply the market with produce. This will enhance the competitive position of the industry, thereby helping more rational marketing and maximising the proportion of the market supplied by UK produce.

### **Summary of Results at the end of cropping year 2**

- In July, August and September temperatures in Lincolnshire exceeded those in Cornwall while the reverse was true from October to March. The amplitude of temperature change was greater in Lincs than in Cornwall.
- Daily solar radiation in Cornwall exceeded that in Lincs in every month.
- Curd initiation was later and occurred at lower leaf numbers with later planting of all varieties at both locations but time to initiation also reduced with later planting.
- Variability in curd initiation was greater in Lincs than in Cornwall.
- The temperatures controlling vernalization appear to be slightly different in the three varieties sampled.
- Curd growth responses to thermal time differed between varieties but solar radiation reduced these differences.
- The intention is after three years work to produce environmentally-driven models to predict both curd initiation and curd growth.
- Elsoms' trials showed reasonable consistency in maturity order.

- Results obtained with a detailed model for Medaillon or Renoir will be related to the whole range of winter cauliflower varieties using the data from these trials. Differences in time to maturity will be expressed in days and if possible using a thermal time scale.
- Varieties varied in their sensitivity to frost, but increased duration at  $-8^{\circ}\text{C}$  resulted in more curd damage and greater losses at harvest particularly with large curds when frosted.
- In contrast to effects on curd damage, the earlier that frost occurred the greater the effect on increasing curd looseness.
- Frost damage to leaves of cauliflower plants is not always a good indicator of the subsequent damage incurred by the curd.

### **Action points for growers**

- None at this stage in the project

### **Practical and financial anticipated benefits**

If the timing of production of the crop is not addressed there is a potential loss to the UK industry of approximately £10 million a year because of replacement by imports. With better prediction of crop timing, cauliflower suppliers will be more accurate in their volume estimates to the supermarket buyer, who will be able to balance his requirement with imports as necessary. This will result in more stable prices and the whole of the UK marketable crop could be moved to meet supermarket requirements resulting in an increase of about £1.5 million of crop marketed annually. In addition, the export of winter cauliflower is increasing by approximately 25-30% each year, currently amounting to £2.5 million per annum. On the basis of these figures the benefit from this work would amount to at least £14 million a year for the foreseeable future.