

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 2000/2001, Cropping Year 3

Location of project: Cornwall, Lincolnshire, Kent and Warwickshire

Project co-ordinator: Mr Phillip Effingham

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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 is trying 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 3

- Cornwall was warmer than Lincolnshire in every month except August and September while solar radiation in Cornwall exceeded that in Lincolnshire in every month.
- The pattern of curd initiation from one transplanting to another was more variable than in previous years.
- Variability in curd initiation within a crop was again greater in Lincolnshire than in Cornwall.
- Initial attempts to model curd induction using three years' data are promising but insufficiently accurate for practical use and further work is needed to understand differences between locations.
- The final number of leaves declined with later planting and data from all three years were consistent.
- Differences in plant size at curd initiation between locations were small but later plantings reduced plant size.
- Curd sizes at maturity were normally distributed. This will enable estimates of the spread of maturity to be made relatively simply.

- Using data from all three years, differences in the time of maturity were largely accounted for by differences in the time from curd initiation to maturity. This suggests that the key to predicting patterns of crop maturity will be to use a model of curd growth.
- Patterns of curd growth were more variable in 2000/2001 than in previous years.
- Using data from all three years, models using day-degrees described curd growth much better than models using solar radiation and fitted well. Base temperatures for each model differed between varieties.
- Elsoms data from three more variety trials were added to that from the previous years and average adjustments for Cornwall, Kent and Lincolnshire together with an overall adjustment were calculated.
- Models showing the relationship between percentage plants damaged and a frost index suggested that a single model using data from Alpen, Medaillon and Renoir could be used to adjust crop volumes following severe frosts.

Action points for growers

- Models to predict the time of curd initiation in Medaillon, Renoir and Tivoli are being developed but need further refinement if they are to be used practically.
- Models describing the curd growth of Medaillon, Renoir and Tivoli fit well and show that each variety has a slightly different response.
- A model indicating percentage plants damaged following frost has been developed.
- Information is now available showing when a wide range of varieties mature relative to Medaillon and Renoir.
- A prototype indicator of patterns of supply of winter cauliflower has been devised and will be tested on commercial crops during the coming winter.

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.