



Agriculture & Horticulture
DEVELOPMENT BOARD



New Project

CP 079 – Amendment 2013

HDC Studentship: Understanding the mechanism and role that pre-harvest horticultural maturity, agronomic factors and growing conditions have on postharvest discoloration in celery.

Project Number:	CP 079
Project Title:	Understanding the mechanism and role that pre-harvest horticultural maturity, agronomic factors and growing conditions have on postharvest discoloration in celery
Project Leader:	Dr Leon A. Terry
Contractor:	Cranfield University
Industry Representative:	Dr Ed Moorhouse, G's Marketing Ltd.
Start Date:	01 September 2013
End Date:	31 August 2016
Project Cost:	£87,700

Project Summary:

The UK celery industry faces periodic, but continued severe problems with postharvest deterioration of celery at both cut petiole and butts ends which can have a significant commercial impact (Dr Ed Moorhouse, G's Marketing, pers. comm.). These problems present a major marketing challenge due to the appearance of the celery in all retail formats (pre-pack, hearts and sticks) which damages sales and customer confidence because the discoloured surfaces imply that the product is "old". This results in substantial losses for the UK celery industry through re-work and crop-waste and the inability to predict/control this disorder also leads to increased customer complaints and rejections with associated costs. Postharvest deterioration of celery at cut surfaces is not thought to be fungal or bacterial in origin, yet the browning/blackening of cut surfaces tends to suggest to customers that the product is senescing and this can result in rejections and more importantly deter sales. The incidence of browning at the vascular surface appears to be sporadic, although it is thought that horticultural maturity and pre-harvest growing conditions immediately before harvest can affect incidence and severity of the physiological disorder.

Aims & Objectives:

(i) Project aim(s):

- Reduce the incidence and severity of postharvest discoloration in celery by better understanding the physiological and metabolomic mechanisms involved in this disorder.

(ii) Project objective(s):

- To identify the nature, identity and abundance of phenolic compounds and their derivatives associated with browning on the cut surfaces (both petioles and butts) of celery
- To elucidate the spatial and temporal changes in phenolics metabolism as affected by horticultural maturity, agronomic factors and growing conditions
- To define the role that horticultural maturity, agronomic factors and growing conditions, as well as postharvest conditions, may have on incidence and severity of cut end discoloration in celery.
- To identify opportunities to reduce/manage this problem in a commercial production environment

Benefits to industry

A better understanding of the factors that govern celery discoloration process would assist growers in predicting/preventing/reducing the problem. Reducing the number of rejections caused as a result of celery discoloration would increase confidence in the product. It is expected that with advances in understanding of the pre-harvest factors that influence the postharvest deterioration of petiole and butt ends of celery commercial strategies may be developed to reduce the impact of this problem. It is also hoped that it may be possible to develop intervention strategies to reduce browning levels in high risk situations (eg. use of post-harvest treatments). However, before any of this can be achieved the causal factors and mechanisms that govern the browning process in cut celery need to be elucidated.

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