New Project

TF 199

Optimising the rate of establishment of controlled atmosphere (5/1) Bramley's Seedling stores to improve storage quality

Project Number:	TF 199
Title:	Optimising the rate of establishment of controlled atmosphere (5/1) Bramley's Seedling stores to improve storage quality
Start and end dates:	1st August 2011 to 30th September 2013
Project Leader:	Richard Colgan, Jim Mount Centre for Post-harvest Research
Industry Representative:	Nigel Jenner
Location:	Produce Quality Centre (University of Greenwich), East Malling Research
HDC Cost:	£48,300

Project Summary:

Scrubbed low oxygen storage (5% CO2 + 1% O2) (5/1 CA) has resulted in major improvements in storage quality of Bramley apples, particularly in the control of bitter pit and superficial scald. The use of 'SmartFreshTM' (1-MCP) or ethylene scrubbing is widespread and provides further scald control. A disadvantage of 5/1 CA with either SmartFresh or ethylene scrubbing is the propensity for carbon dioxide injury. To avoid this it is recommended that establishment of CA conditions for SmartFresh treated fruit is delayed for 3 weeks. Concerns regarding the ability of stores to achieve rapid establishment of 5/1 CA after this initial delay has prompted many growers to adopt a procedure whereby stores are sealed immediately and carbon dioxide is scrubbed while oxygen concentrations are allowed to drop to 10% for 21 days before 5/1 conditions are established. An optimum strategy has not however been established. This project therefore seeks to determine an optimum strategy to contol CO2-injury while maintaining background colour, firmness, bitter pit and scald control in long-term stored Bramleys. Bramleys stored long-term are also susceptible to high numbers of core rots (up to 8-10% losses). More rapid establishment of CA may lead to a reduction in the incidence of core rots.

Aims & Objectives:

(i) Project aim(s):

Aim 1 To define strategies for the establishment of controlled atmosphere storage conditions for Bramley apples to improve quality and reduce wastage due to fungal core-rots of long-term stored fruit, so that a higher proportion of fruit is suitable for supermarket sale.

Aim 2 To achieve a quicker rate of establishment of conditions without compromising control of CO2-injury whilst having the additional benefit of improved maintenance of background green colour, firmness retention and improved scald control in long-term stored Bramleys.

(ii) Project objective(s):

1.0 To assess selected protocols for the establishment of CA conditions for Bramley apples in terms of their effects on physiological damage including carbon dioxide injury.

1.1 To investigate the use of rapid establishment of oxygen in Bramley 5/1 CA stores to determine the improvements in fruit quality and fungal rots without compromising control of carbon dioxide injury.

1.2 To assess the effect of a 5 day delay in the application of 1-MCP (SmartFreshTM) to early-picked Bramley's apples on the sensitivity to carbon dioxide injury and rotting in storage strategies tested

1.3 To develop an improved commercial strategy for oxygen and carbon dioxide establishment in 5/1 Bramley stores

2.0 To disseminate the results obtained, including through the EMRA members day on fruit storage and training days where appropriate.

Further information

Email the HDC office (hdc@hdc.ahdb.org.uk), quoting your HDC number, alternatively contact the HDC at the address below:

HDC
AHDB
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2TL

Tel – 0247 669 2051