

Grower Summary

TF 200

Apple: Determining the effectiveness of novel calcium products to increase fruit calcium, increasing storage potential and potentially reducing bitter-pit

Final 2012

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Use of pesticides

Only officially approved pesticides may be used in the UK. Approvals are normally granted only in relation to individual products and for specified uses. It is an offence to use non-approved products or to use approved products in a manner that does not comply with the statutory conditions of use, except where the crop or situation is the subject of an off-label extension of use.

Before using all pesticides check the approval status and conditions of use.

Read the label before use: use pesticides safely.

Further information

If you would like a copy of the full report, please email the HDC office (hdc@hdc.ahdb.org.uk), quoting your HDC number, alternatively contact the HDC at the address below.

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HDC is a division of the Agriculture and Horticulture Development Board.

Project Number:	TF 200
Project Title:	Apple: Determining the effectiveness of novel calcium products to increase fruit calcium, increasing storage potential and potentially reducing bitter-pit
Project Leader:	Gary Saunders,
Contractor:	East Malling Research
Industry Representative:	Nigel Kitney, HL Hutchinson
Report:	Final Report, September 2012
Publication Date:	05 November 2012
Previous report/(s):	-
Start Date:	01 April 2011
End Date:	30 September 2012
Project Cost (Total Project Cost):	£2,970 (£18,970)

Headline

- There were no clear advantages of any of the applied calcium products over the untreated control in this one year trial

Background and expected deliverables

Calcium concentrations in apple are known to be associated with fruit storage potential and the development and expression of bitter pit. The potassium to calcium ratio is also known to have an influence over storage potential, the greater the ratio of potassium to calcium, the less the potential storage period. This one year project was undertaken to determine the relative efficacy of existing and new calcium based products at increasing calcium concentrations within Bramley Seedlings fruit. Seven foliar calcium products were evaluated along with a standard calcium chloride treatment and an untreated control to determine their effectiveness at increasing fruit calcium and storage duration and their effectiveness at reducing bitter-pit.

Summary of the project and main conclusions

The treatments included consisted of:

1. Control – Untreated
2. Control – Calcium chloride flake (CaCl_2)
3. Pi212
4. Coded – HDC P001
5. Yara Vita Stopit
6. Carnival
7. CaB
8. Wuxal
9. Coded – HDC P002

All of the above products were applied according to manufacturer's recommendations for best practice in terms of timing, rate and water volume, subject to weather conditions at the time of application. These treatments started at bud burst and continued throughout the season.

Fruit firmness was determined and mineral analysis recorded from samples of fruit at harvest. The resulting storage potential was predicted. Another sample was stored for post-storage assessment to determine the effect on bitter-pit.

Fruit firmness was recorded above 9.5 kg for all treatments, although Treatments 3 (Pi212) and 7 (CaB) were significantly lower than the CaCl_2 control, Treatment 5 (Stopit) and Treatment 9 (coded product). Pi212

The fruit mineral analysis showed no evidence of significant differences in calcium concentrations between treatments. All levels were reasonably high, with concentrations above the figure of 4.5 mg/100g fresh weight- the level recommended by the Quality Fruit Group for long-term storage. This indicates that this was a good year for calcium uptake. Storage potential varied a little but all fruit was predicted to store medium to long-term.

The post-storage assessments showed no significant treatment differences in the development of bitter-pit, although the lowest levels were found in the CaB and Pi212 treated fruit.

In summary, 2011 was a reasonably good year for calcium uptake with the untreated control having a good concentration of calcium in the fruit. If calcium uptake had been poor it would probably have been easier to determine differences between treatments. However, in this trial, there were no significant differences in calcium concentrations between the treatments.

The cost of treatment applications varied, but with no clear benefits arising from any of the treatments, no clear conclusions can be drawn as to recommendations for particular products. This is a potential problem when carrying out short-term agronomy experiments with perennial crops.

Financial benefits

No financial benefits could be identified from this one year project..

Action points for growers

No action points have arisen from this project.