



Horticultural
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Council

Grower summary

HNS 157

Optimising defoliation in young trees

Annual report 2009

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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.org.uk), quoting your HDC number, alternatively contact the HDC at the address below.

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Headline

Understanding, managing and enhancing defoliation in young trees

Background

Nurserymen are concerned that natural leaf abscission on field-grown trees is occurring later each year, due to milder autumns. A consequence of this is that tree lifting can be delayed with nurseries failing to meet early demand from the landscape sector, or that some nurseries are being forced into lifting trees to meet orders whilst the foliage is still attached. Chemical defoliant is available to nurserymen, but these need to be applied with care to promote a strong enough abscission response, yet avoid damaging the crop.

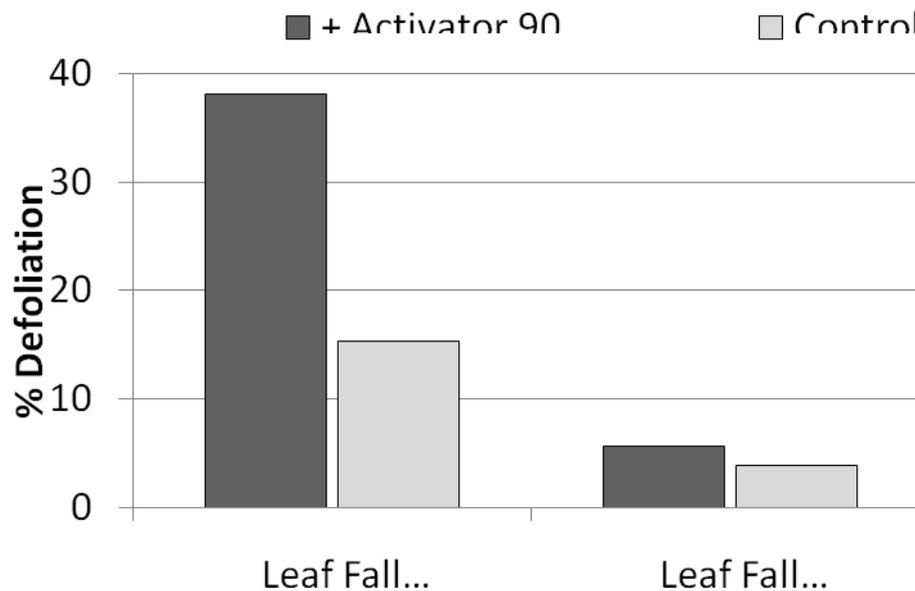
This project aims to optimise the use of existing chemical products, and to explore cultural and alternative techniques that either enhance the effectiveness of these, or provide an alternative mechanism for defoliation. Work is focused on trying to defoliate field-produced stock through a number of field trials at both commercial holdings and the University of Reading. Experiments in controlled conditions help determine the relationship between potential defoliant and the physiological stage of the crop at the time of application.

Summary

- 'Leaf Fall' a commercial product containing Copper-EDTA) remains the most effective chemical for defoliating young trees
- Effectiveness of 'Leaf Fall' remains variable, however, depending on crop type and time of application (e.g. 60-80% defoliation in *Crataegus* compared to only 15-33% in *Malus 'Bramley'*)
- Alternatives (including Iron-EDTA) did not perform as well as 'Leaf Fall' or provide any economic advantage.
- The addition of a wetting agent improved the action of 'Leaf Fall' when applied at the recommended rate of 20 ml⁻¹, but not when the rate was dropped to 5 ml⁻¹. (Figure A).
- Mild drought stress may enhance natural leaf abscission in warmer autumns.
- A secondary effect of defoliating with 'Leaf Fall' may be stronger re-growth in spring.

- Late season applications of growth retardants did not significantly improve the effect of 'Leaf Fall' and reduced spring re-growth.
- Simulating frost conditions aided defoliation, but only when shoot activity / auxin transport was disrupted in the young tree.
- Chilling temperatures (+20°C

Figure A. Defoliation recorded in *Malus 'Bramley'* at site B on 31st October 2008, after applying 2 concentrations of 'Leaf Fall' +/- Activator 90 two weeks previously.



Financial benefits

- Feasible, alternative defoliant to 'Leaf Fall' evaluated in the project to date, appear to be no more cost effective than 'Leaf Fall'.
- Savings can be optimised by adding wetters / considering concentrations of 'Leaf Fall' required.
- Techniques that disrupt apical activity late in the growing season (undercutting, moderate drought imposition, lower fertilizer concentrations) may help reduce the requirements for chemical defoliant. The challenge remains in meeting the height and quality specifications for the crop.

Action points for growers

- Currently, 'Leaf Fall' remains the most effective way of defoliating young trees. Nurserymen, should consider how its use can be optimised to maximise effect and minimise costs
- Wetting agents may improve the action of 'Leaf Fall' by up to 100% when both products are used in late autumn at the recommended rate
- A half rate of 'Leaf Fall' with wetter may be worth trying (at least for those cultivars that appear more responsive to defoliant anyway)
- Applying mild drought stress during late summer / autumn may encourage defoliation. Field irrigation schedules should be reduced when warm 'Indian Summer' conditions are experienced and the crop has attained its specified height.
- Nurseries with containerised stock grown under protection, and which require early defoliation to aid subsequent cold storage or transportation, may wish to consider reduced irrigation / controlled drought as a tool.
- Triazole-based growth regulators have no universal effect on autumn defoliation, but can inhibit re-growth in the following spring.