Grower Summary

HNS 164

Improving basal breaking of field-grown roses using ethylene releasing agents

Annual report 2009

Title:	Improving basal breaking of field-grown roses using ethylene releasing agents
Project number:	HNS 164
Project leader:	Dr Mark A Else, East Malling Research
Report:	Annual Report March 2009
Previous report	Not applicable
Key staff:	Mrs June M Taylor Miss Clare Hopson Mrs Abi Dalton
Location of project:	Paul Chessum Roses Ltd, Briar Patch Nursery, Ickwell Road, Upper Caldecote, Biggleswade, Bedfordshire, SG18 9BS UK
Project coordinator:	Dr Neal Wright, Micropropagation Services
Date project commenced:	1 April 2008
Date project completed (or expected completion date):	30 June 2010
Key words:	Basal breaking, Class 1 grade-out, Ethrel C, Cerone, Ethylene releasing agent, Field trial, Quality, Rose

Whilst reports issued under the auspices of the HDC are prepared from the best available information, neither the authors nor the HDC can accept any responsibility for inaccuracy or liability for loss, damage or injury from the application of any concept or procedure discussed.

The results and conclusions in this report are based on an investigation conducted over a one-year period. The conditions under which the experiments were carried out and the results have been reported in detail and with accuracy. However, because of the biological nature of the work it must be borne in mind that different circumstances and conditions could produce different results. Therefore, care must be taken with interpretation of the results, especially if they are used as the basis for commercial product recommendations.

AUTHENTICATION

We declare that this work was done under our supervision according to the procedures described herein and that the report represents a true and accurate record of the results obtained.

Dr Mark A. Else
Research Group Leader
East Malling Research

Signature ..... Date .....

Mrs June M. Taylor
Research Assistant
East Malling Research

Signature ..... Date .....

Report authorised by:

Dr Christopher J. Atkinson
Science Director
East Malling Research

Signature ..... Date .....

Grower Summary

Headline

Cerone (an ethylene releasing agent) improved basal breaking and grade-out of 'shy' breaking Hybrid T cultivars in field trials at Paul Chessum Roses

Background and expected deliverables

This HDC project is developing previous Defra-funded strategic research on manipulating branching in woody perennials in to more applied work to improve the quality of containerised roses. The accepted standard for class 1 rose bushes requires a minimum of three strong shoots (basal or bottom breaks) originating from just above the graft union. However, at present only 60% of the estimated 12 million bushes propagated annually make this grade. Some so-called 'shy' breaking cultivars (cvs) produce only one or two breaks despite repeat pruning during production to try to stimulate branching. However, these roses often have other very desirable attributes such as large, fragrant blooms. Improving the class 1 grade-out of 'shy' cvs would help to increase the profitability of the industry and reduce wastage during production.

Although Ethrel C, an ethylene releasing agent (ERA), is a very powerful defoliant, our work over three seasons in Defra project HH3715SHN has shown that low concentration, low volume spays have the potential to increase basal breaking in 'shy' cvs by up to 66%, if applied at the optimum time during the production cycle. Furthermore, using one spray at the critical time during development has been more effective than using three separate pruning treatments in triggering basal breaking in some 'shy' breaking cvs. Field trials are now needed to determine whether this approach will be successful in commercial rose production. Alternative ERAs need to be trialled since Ethrel C is due to be withdrawn from use in the near future. In addition to improvements in product quality, the project will also help to deliver reductions in waste at grade-out and reduced labour costs associated with pruning and grading.

There are two main aims to this project:

1. To identify alternative ERAs to Ethrel C

2. To determine the effects of low concentration, low volume sprays of an ERA on basal breaking and grade-out of 'shy' rose cultivars

Expected deliverables from this work will include:

- Increased basal breaking in 'shy' cultivars
- Improved grade-out of class 1 rose bushes
- Reduced crop waste
- Increase plant visual appeal (more flowers from greater numbers of breaks)
- Reduced need for cultural operations and labour input (trimming/grading)
- Improved profitability of the British rose industry

Summary of the project and main conclusions

Application of ERA

Suitable shy breaking rose cvs were selected for the trial by Mr Clive Faulder of Paul Chessum Roses (PCR). The Hybrid T's 'Alec's Red' and 'Just Joey' and the Floribundas 'Margaret Merril' and 'Mountbatten' were budded on to *Rosa laxa* rootstocks in single rows at two field sites (Great West at Upper Caldecote and Montilliers Everton). Experimental blocks, each consisting of seven budded rootstocks, were staked out on 15 April 2009. Cerone was suggested by Mr John Adlam (Dove Associates) as an alternative ethylene releasing agent (ERA) to Ethrel C. Two concentrations of Cerone were used. 0.25 or 0.5% solutions were prepared and a wetting agent (0.1% Activator 90) was also included. A solution containing wetting agent without Cerone served as a control. Low volume sprays of Cerone were applied to the new shoots and around the bud shield on 16 April 2009 using handheld sprayers. Sprays of either 0, 0.25% or 0.5% Cerone were applied to the first five plants in each experimental block, the two remaining plants in each block serving as guard plants. The new shoots were approximately 5 cm long at the time of the Cerone applications. The number and diameter of basal breaks, stem height and the number of flower buds produced were recorded at intervals over the 2009 growing season.

Effects of ERA on shoot morphology

Stem height was reduced by the Cerone sprays in 'Alec's Red' and 'Just Joey' but was unaffected in the other cvs. Compared to spray controls, the number of basal breaks was increased by both Cerone concentrations in 'Alec's Red' and 'Just Joey'. Cerone sprays did not improve basal breaking in 'Margaret Merril' or 'Mountbatten'. The 'tipping back' treatment practised at PCR increased basal breaks still further in 'Just Joey' and 'Margaret Merril'. The diameter of the basal breaks was not greatly affected by the Cerone sprays. Numbers of flower buds were reduced in most cvs but only by one or two buds per plant.

Effects of ERA on percentage grade-out

All experimental roses were lifted and graded by PCR's staff on 20 October 2008. The number of class 1 roses for each cv. was counted; these plants were then pruned and put into cold store. All bare-rooted bushes were potted into 4 L pots at PCR and moved to the holding beds in February 2009. The final grade-out was carried out on 16 March 2009. The percentage grade-out was improved from 60% in spray controls to over 90% in 'Alec's Red' sprayed with 0.5% Cerone spray. Grade out was not affected by Cerone sprays in 'Margaret Merril' and 'Mountbatten'. The grade-out of 'Just Joey' could not be determined since some experimental bushes were lifted with the commercial crop and the labels removed. However, earlier measurements of basal breaks and shoot diameters indicated that Cerone treatment would also have increased grade-out of this shy cv.

Financial benefits

Improving basal breaking in 'shy' cvs using Cerone has the potential to improve plant quality and grade-out and reduce waste during production. If the low volume, low concentration ERA sprays being trialled are successful, the approach is likely to be very cost effective. Over 1,000,000 plants could be treated with just one bottle of Cerone costing £110, equating to a cost of 0.01p per plant. The financial benefits resulting from these treatments, and the associated reductions in labour costs and waste, will be discussed with industry representatives and retailers during the final year of this project.

Action points for growers

- 'Tipping back' will help to improve the number of basal breaks produced, and therefore, the grade-out of shy breaking rose cultivars.

- Try using sprays of 0.5% Cerone solution plus wetting agent, applied at the 'shot' bud stage to improve basal breaking in 'shy' Hybrid T cultivars