



Agriculture & Horticulture
DEVELOPMENT BOARD



Grower Summary

CP 103

The Application of Precision
Agronomy to UK Production of
Narcissus

Annual 2014

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| Project Number: | CP 103 |
| Project Title: | The Application of Precision Agronomy to UK Production of Narcissus |
| Project Leader: | Rob Lillywhite, University of Warwick |
| Contractor: | University of Warwick |
| Industry Representative: | Mark Clark, Grampian Growers Ltd., Logie, Montrose, Angus, DD10 9LD |
| Report: | Annual Report 2014 |
| Publication Date: | 10 April 2015 |
| Previous report/(s): | None |
| Start Date: | 30 September 2013 |
| End Date: | 30 September 2016 |
| Project Cost: | £67,650 |

GROWER SUMMARY

Headline

- A survey of commercial growers was carried out in early 2014. Thirty-one growers and cooperatives responded.
- The project started in October 2013 and the field trials were established in four locations during the period July to October 2014.

Background

The UK narcissus industry has fallen behind other arable and horticultural sectors in terms of the technology it employs, despite leading the world in terms of its output. The heyday of narcissus research came in the 1950s-1980s, mainly courtesy of the Rosewarne and Kirton research stations, when many of the agronomic parameters affecting yield and crop quality were established, as well as refinements in crop handling and pest and disease control. However, changes in production practices, markets and varieties have rendered much of the evidence and recommendations obsolete. The findings of this period need to be examined, and if necessary revised, to reflect current practice. It is hoped that advances in precision agronomy from other horticultural sectors, e.g. potatoes and onions, will be able to address some of the problems facing the industry, or simply boost productivity while lowering costs – a necessary intervention in a time when production costs are rising, but retailers are static on pricing.

Summary

Field trials were established to examine a number of different production approaches including bulb density, planting depth and bulb orientation.

- Bulb density – Research in the 1970s examined a wide range of experimental densities (7.7 up to 78 t/ha) and established that the optimum density at planting was around 17 t/ha for flower production and 10 t/ha for bulb mass increase. This project is using a narrower range (5 to 27 t/ha) to examine if those recommendations remain valid for current commercial practices.
- Planting depth - Deeper planting has been proven to benefit the crop, but must be traded off against ease of lifting. The benefits of deep planting will be re-assessed throughout this project.

- Bulb orientation - The effects of placing the bulb (either upright or inverted, compared to the random orientation currently used) will also be assessed to establish any benefits that could be gained from developing a precision planting system.
- Fertiliser placement – Precision placement of fertilisers is being used by some growers and anecdotal evidence suggests that fertiliser savings of around 30% are possible. This will be investigated experimentally to inform a cost-benefit analysis for the technology in its various forms.

A number of key targets have been identified for precision technologies that are likely to benefit daffodil growers, particularly precision planting (planters able to distribute the bulbs evenly); screening of bulbs for pests and diseases; and monitoring levels of crop protection products during hot water treatment. Some existing solutions already used in other sectors, such as the onion, apple and potato industries, will be evaluated on their suitability for ornamental bulbs. Others will be developed from scratch, based on devices already used in horticulture, medical diagnostics, bulk goods handling and more.

Each of the precision solutions conceived will be tested as far as possible and cost-benefit analyses conducted to establish which are most likely to boost grower productivity.

This project examines how precision agronomy can be applied to narcissus production. The aspects of production being investigated include:

- The effects of crop density and depth on bulb stocks and cut flower production;
- Reductions in fertiliser usage by 30% by using precision placement;
- Identify precision technologies and methods to maximise productivity, reduce costs and meet variable demand more reliably;

This report covers the first year of the project; October 2013 to September 2014 and includes details of the activities undertaken. In general terms, the first year was devoted to gaining an understanding of the industry, so that experiments can be tailored to these standards and practices, and establishing the field trials. The main experimental data will follow in the second and third years – the products of four sets of field experiments, both at the Warwick Crop Centre and on growers' holdings in Cornwall, Lincolnshire and Aberdeenshire.