



Agriculture & Horticulture
DEVELOPMENT BOARD



Grower Summary

PO 005

Column stocks (cut-flowers): An Investigation into the cause(s) of poor establishment, growth and flower uniformity in commercial crops.

Annual 2011

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

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Project Leader:	Lyndon Mason
Contractor:	L & RM Consultancy Ltd
Industry Representative:	Colin Frampton
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Headline

- The production problems experienced by column stock growers in recent years are complicated and quite numerous.
- There is a clear correlation between the choice of variety and their susceptibility to root problems and subsequent establishment issues.
- Fewer problems occur in steamed soil but careful choice of varieties can enable a crop to be grown without the need for steam sterilisation each year.

Background

Over the past few years UK producers of column stocks have seen an increasing incidence of problems leading to plant losses and a reduction in the percentage of the crop that is marketable. In some cases this was as up to 50% but an average would probably be nearer to 15%. Unfortunately, current crops are failing to establish, grow and flower uniformly with resultant increased labour costs owing to increased grading and repeated cuts. Unless resolved, this problem could result in UK growers ceasing to grow an otherwise highly acceptable, and in-demand, cut-flower crop.

However there was a lack of agreement amongst the industry as to the cause of the problem that has led to a lack of confidence in the crop and subsequent reduction of about 10% in the overall area produced at a time when the supermarket demand for the crop has never been higher. A number of reasons had been put forward by growers as to the cause of the problems ranging from establishment problems owing to the glue plug through to poor seed selection. However, there was far from universal agreement within the industry as to the cause of the problem and this was the key reason for the HDC funding a detailed practical survey of the industry in 2011.

Summary

The 2011 survey provided a comprehensive review of the column stock industry and incorporated a large proportion of the industry with about 90% being involved in one form or another. Four key growers were involved in the detailed survey, whom collectively produce about seven million stems representing about 60% of the total English production. In addition to these four growers, the project manager also visited an additional seven growers who collectively produced another four million stems.

Collectively these growers were using 68 different glasshouses providing a broad survey sample in terms of house size, house type, soil type and growing technique.

Visits were made between 11th March 2011 (week 10) and 21st July 2010 (week 29) with a total of 82 visits over this period.

The following is a list of the headline observations that have come out of the 2011 survey work:

- Approximately 12 million stocks were planted in 2011, with about two million (17% of the total) being second round production. Of the total of 12 million plants approximately 75% (9 million) was grown in steamed soil, about 19% (2.3 million) grown in Basamid sterilised soil and 6% (0.85 million) grown in unsterilised soil. Of the 9 million grown on steamed soil, about 5.85 million (about 49% of the total produced) were grown on soil sterilised by “dry” (super heated) steam with 3.15 million. around 26% of the total produced) grown in soil sterilised by “wet” steam.
- The survey work has shown conclusively that there is not one single problem affecting column stock crops and that a combination of factors is responsible for the problems experienced in recent years.
- Growers who had steam sterilised the soil prior to planting their crop of column stocks suffered from very few problems with *Pythium* or poor root development, even in poor quality glasshouses with less than ideal growing conditions (except where there had been a specific soil structure issue from for example flooding due to a burst pipe and even then poor root development rather than disease was the key issue).
- There was circumstantial evidence on some nurseries that problems still occurred if the steaming took place a long time before the crop was planted e.g. autumn steaming following by spring planting. But this was not observed during the 2011 survey.
- Growers who had not used any form of sterilisation or had used Basamid, consistently had problems with the same varieties i.e. ‘Aida’ blue, white and lavender and ‘Figaro’ light pink and rose. Since about 75 % of the total stock area is steam treated, then only around 25% of the UK stocks grown were affected by this problem. However, for those growers who had not steamed and did grow ‘Aida’ and ‘Figaro’, this was a very serious problem with 50 - 90% of the stems affected in some crops.

- There was appreciation between the main propagator and the breeder that these varieties are weaker rooted and would therefore be prone to problems on unsteamed soil. This also led to the conclusion that the growers and propagators should work more closely together in order to match the choice of varieties grown, to the conditions that they will be produced under, especially with reference to soil sterilisation techniques.
- The problems observed in the varieties listed above took the form of poor root development, lack of vigour (leading to stems of unmarketable quality), wilting and in some cases total plant collapse and death. In such cases *Pythium* was consistently isolated from the affected plants and it is believed this disease would have been a contributing factor to this problem. Further investigations and trial work will be undertaken in 2012.
- *Fusarium* is still a potentially major problem on some nurseries, especially, but not exclusively, on sites with a history of the disease in the soil. This was still the case were the soil had been steamed prior to planting.
- In 2011 (as with previous years) *Fusarium* mainly occurred in later planted crops and with two varieties in particular 'Francesca' and 'Centum' deep blue. Only a small percentage of the total stems grown were lost through *Fusarium* (perhaps up to 5%), however, when the susceptible varieties are looked at in isolation about 20% of the susceptible varieties were typically affected with wide variation from nursery to nursery (from negligible losses in some cases up to 50% losses in others).
- There was universal agreement amongst growers that the current varieties flower less evenly than they did a decade ago and it is now necessary to go over them two or three times rather than employ a one-off cut.
- The need to ensure good seed selection and stock maintenance in order to ensure a potentially more even crop seems to have been taken on board by growers, propagators and breeders alike.

- The main propagators' decision to move from glue plugs to loose fill was seen as a positive move with most growers agreeing that initial plant establishment was better with loose-fill than the glue plugs.
- However there was universal agreement that the loose-fill plug needs to be made more stable in order to facilitate better gapping up in the trays and easier planting on the nursery. This has been addressed by the main propagator who has installed a new filling machine and conducted a number of trials with the new plug prior to the main 2012 production period.
- In addition to the main problems described above, some growers also experienced poor establishment and slow growth with 'Carmen' yellow. Most of the crop was eventually marketable but was very uneven and 10 to 14 days behind the other varieties in the same house. However this issue only occurred on a small number of plantings on three nurseries and no explanation has so far been found to adequately explain the problem.

Financial Benefits

At an average planting density of 64 plants per square metre, every metre of lost crop represents about £16 of lost income. The survey has identified a number of key action points for growers which will help to reduce crop losses in 2012 and beyond hence reducing the level of wastage. However, the most significant financial benefits will result from improved control of *Pythium* and especially *Fusarium* and this is the focus of the work in 2012.

Financial losses also occur as a result of downgrading of lower quality stems and repeat harvesting of uneven crops. The use of appropriate varieties to suit time of year and sterilisation technique will help to reduce these financial losses. It is difficult to make an accurate estimate of the value of these savings but individual growers will be aware of their own costings in this respect.

Action Points

The following action points should be considered as a result of the 2011 survey but may be modified in the light of the 2012 work.

- Investigate any unexplained plant losses or areas of poor growth and consider sending plant and soil samples for laboratory analysis of the problem.

- If growing on soil that has not been steamed try to avoid planting 'Aida' and 'Figaro'.
- If the nursery has a history of *Pythium* problems consider treatment with a specific *Pythium* fungicide even if steam sterilisation has been carried out.
- If the glasshouse has a history of *Fusarium* try to avoid late plantings of 'Francesca', 'Centum' deep blue and 'Opera Deborah'.
- Work closely with plant suppliers to ensure that the varietal choice is suitable.