



Agriculture & Horticulture  
DEVELOPMENT BOARD



# Grower Summary

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## HNS 136a

Management tools for  
optimising nursery space use  
and production forecasting

Final 2013

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

**Project Number:** HNS 136a

**Project Title:** Management tools for optimising nursery space use and production forecasting

**Project Leader:** Professor John Colvin

**Contractor:** University of Greenwich

**Industry Representative:** Mr Dave Hooker, Hillier Nurseries  
Dr Bill Godfrey, Hook Mill Nursery  
Dr Steve Carter, Fleurie Nursery  
Mr Chris Bowman, Osberton Nurseries

**Report:** Final Report 2013

**Publication Date:** December 2013

**Previous report/(s):**

**Start Date:** April 2010

**End Date:** August 2013

**Project Cost:** £61,089

## Headline

Reduce the risks inherent in your HONS business and increase its profitability by investing in systems that cost production accurately and manage space efficiently.

## Background

A previous HDC-funded project (HNS 136) found that liner nurseries involved with the project lacked an accurate way of costing their production process, thereby making it hard to identify easily where losses were occurring or how the profitability of individual varieties was affected by crop non-uniformity and yield.

To help address this problem, a decision-support modelling package called “ProGro 2009” was built, which was designed using knowledge and feedback from nursery managers at key stages of the program’s development. HNS 136’s activities were focused on the beginning of the plant-production process, because this was considered to be the most cost-effective way to tackle the non-uniformity problem. ProGro 2009, therefore, now provides liner producers with a method of costing production, identifying losses at the different stages and optimising profits in relation to variability in the crop. It was built in the familiar Excel spreadsheet format and so can be customised easily to suit individual nurseries’ needs.

With the ability to cost and optimise production for individual liner varieties, the related issue of the efficient use of nursery space immediately arises. ProGro 2009 shows consistently that when production is optimised, significant areas of nursery space become freed up and therefore potentially available for the production of additional profitable product lines.

Some finished-plant producers already have bespoke plant-variety costing systems and so important information on the relative profitability of different plant varieties is available to them. These systems, however, apparently lack a production-time component to costing, which is incorporated into ProGro 2009. The adaptation of existing finished-plant nurseries’ costing tools to include a production time component, therefore, would be one of the first steps required for creating a widely applicable space-management tool.

The efficient management of space, which is particularly important when it involves expensive heated glasshouses or propagation facilities, is a complex problem that all nursery growers face, which is suited to modeling. The complexity of the problem is compounded by the seasonal and biological constraints that determine the availability of new plant material or

liners, as well as the requirement for plants to be moved between the different types of plant-growth areas.

Such complex problems do require the power provided by computers to help find practical solutions quickly. In 2004, a survey on the use of computers in the retail and amenities sectors was carried out by KPMG. It showed that information technology (IT) was widely used in sales, finance, inventory, dispatch and communications and most nurseries used bespoke IT systems. Microsoft Excel was mentioned by many respondents and a few used Wintree, Growmaster, IFS and Plantpro.

Apart from IFS and Excel, however, these software packages lack an operations modeling capacity. The IFS Business Modeler is difficult to apply to HNS nursery operations, due to the biological constraints inherent in plant production (John Woods Nurseries, pers. comm.), and so there is a need for a software package to be developed that is capable of assisting managers to plan and optimise the use of their different space resources. Excel, when used in combination with Visual Basic programming, provides a powerful platform able to achieve this. The activities and milestones described below, therefore, were formulated both before and after the initiation and commissioning of this project, with the active participation of HONS nursery production managers.

The project was commissioned with a particular set of objectives and associated milestones for the first year. In the light of information collected after initial visits to growers' nurseries, the Year 1 activities and milestones were re-assessed at a meeting with the project's Industry Representatives at Farplants Sales Ltd., West Sussex, on 10<sup>th</sup> August 2010. Discussions from the previous meeting were presented and it was decided that an industry-wide, 'base-line' survey was required in order to collect information on current approaches and methods used to calculate the cost of production of HNS product lines. It was also decided to build a basic costing tool, with the provisional name "ProGro Bronze". This costing program was subsequently re-named "ProCost". In order to achieve this, the project (HNS 136a) was put 'on-hold' for four months to allow Professor Colvin and Mr Will George to submit a concept note and full proposal for a survey to the HNS panel. This funding application was successful and the survey was subsequently conducted. It generated substantial interest and 72 (approximately 20% of HONS businesses) returned forms were received from a broad spectrum of nurseries of all sizes operating in the various HONS market sectors.

Due to the lack of an easy-to-use production costing tool, the overwhelming majority (81.4%) of respondents to the questionnaire said that they wanted to receive an HDC-funded costing tool to calculate plant production costs. In addition, when the responses were analysed by nursery turnover, even nurseries in the smallest turnover group expressed a strong demand for a production-costing tool.

The survey data also showed that for nurseries in all turnover categories, space management (“fitting production into the available space”) could be a highly important issue and that when turnover exceeds £2.0 million, the importance attached to space management increases substantially. Almost all nurseries (92.8%) also rated forecasting demand either a score of six or higher (out of 10). Demand forecasting, therefore, is clearly also an issue of great interest to almost all HONS nurseries and, in general, ranks above space management in importance. When asked if their nursery (production or marketing managers) would be interested in using space management and demand forecasting tools, if they were developed and distributed free by the HDC, 72% and 73% said “yes”, respectively. These percentages are only slightly lower than the percentage requesting a production-costing tool.

The survey data were analysed to determine the percentages of respondents that requested none (15.3%), one (19.4%), two (9.7%) or all three (55.6%) of the proposed tools. 84.7% of the nurseries, therefore, said they would like to receive one or more of the tools.

The nurseries stipulated that the key characteristics of the tool(s) must be “ease and simplicity of use and data capture”, as well as the ability to simulate situations and to optimise (maximise) profits.

## **Reference**

KPMG (2004) HDC survey analysis, 10<sup>th</sup> June 2004, Final Report.

## **Summary**

The mini-survey of six nurseries at the start of the project provided an indication that there was no widely-used production costing tool available to HONS nursery managers. This presented a problem for the proposed space-management tool development planned for the project’s first year. At the first project review meeting, therefore, it was agreed to carry out an industry-wide survey to collect the data to confirm or reject this preliminary conclusion. The outcome of this much larger survey confirmed the findings of the mini-survey and so the project’s milestones were revised with the aim of developing a ‘simple-to-use’ production costing tool. The tool was initially called “ProGro 2012 *Bronze* version” and subsequent to its

release renamed “ProCost” to differentiate it from previous work. It was designed and built following an iterative process that involved Professor Colvin interacting with HONS production managers to obtain clear feedback after each stage of the tool development had been completed. ProCost has now been released and is readily available on the HDC website for all growers to download and use. This is now in use and workshops have been held to promote the tool amongst growers.

Many years of experience and frustration experienced by HONS production managers have highlighted the requirement of a tool that could take account of different environment types specific to individual nurseries and cope with the different categories of space that are found within nurseries such as heated and unheated glasshouses, poly tunnels and outdoor areas to name a few. The tool also needed to be capable of fine tuning space requirements as the year progresses and had to be powerful enough to cope with the production of more than 2000 species. At the project review meeting at the end of year 1, it was agreed that ProSpace development should go ahead. ProSpace was designed and built following a similarly iterative process to ProCost. Professor Colvin attended several project meetings with HONS production managers and HNS managers to obtain clear feedback and address specific requirements/requests of the HONS production managers. The tool was built and is ready for release on the HDC website in two different versions of Excel that account for the different operating systems used in nurseries across the country.

## **Financial Benefits**

There has been insufficient time to assess the financial benefits from this project, because the production costing tool has only recently been released to industry. However, at the grower workshops organized for ProCost, several of the participants said that they were already using ProCost to make business decisions.

The longer-term goal of HNS 136a is to help to improve the profitability of HONS nurseries by building computer-based tools that help management make financially beneficial decisions. The survey data collected by HNS 136b provided base-line data which provides an accurate measure for future benefits of the project.

The space management tool, “ProSpace”, has been built and is ready for release to industry; it is anticipated that this tool will deliver significant financial benefits to nurseries that utilize it and it is now available on the HDC website for all growers to download and use.

## **Action Points**

- Spend as much time as possible using the tools and getting to know the software and what the tools can do. Invest time to understand what the tools can do for you and you will reap huge dividends for your business.
- Collect up-to-date financial information on production costs, which will enable you to derive benefits immediately from the production costing tool. Necessary data include the costs of: the plant starting material, compost, containers, agrochemicals, sundry items, crop density, type of plant-growth area, staff labour, distribution and marketing, overheads, a category of all other costs not included under the other headings and the total annual costs for the nursery.
- Ensure records are kept of the initial number of plants present in each 'batch', the numbers that reach a 'saleable' standard, as well as the total numbers sold.
- Ensure that you are not inadvertently under-pricing products. To avoid this, make sure that production cost calculations are accurate and that they include all production costs as well as overheads.
- Increase computer skills on the nursery. Send key personnel on a course(s) to update their computer skills, particularly in Excel.
- Obtain the production costing tool from the HDC website.
- Obtain the production space management tool from the HDC website.
- Put into practice what has been learnt at the knowledge transfer workshops. Follow advice provided and guidance given and pass this on to your staff who may use the tools.
- Read and use the ProCost and ProSpace user manuals, it will help you understand what the tools can do and how best to enter data and obtain outputs from the tools.
- Ensure the details being entered into the various datasheets are accurate and complete. It is important to make sure data is entered correctly and fully to avoid error messages.

- Discuss issues you may find with the ProSpace model with your colleagues and other growers.