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Improving efficiencies with- in the nursery industry

The nursery and garden industry is continually being forced to improve efficiencies in production, dispatch, transport, training and market research. As a result, nursery products levy money and considerable effort has gone into researching efficiency improvements for the industry. This *Nursery Paper* highlights some of the efficiency and mechanisation improvement projects that have been carried out for the nursery and garden industry.



Production

Mechanising certain processes, known as mechanisation, can result in considerable efficiency gains for nursery production if the implementation is done correctly. Two mechanisation projects have been carried out, one on material handling, the other on potting up.

Improving material handling

This project developed prototype manual pot-lifting devices aimed at reducing the labour input. The devices allowed one person to carry and space several pots at a time.

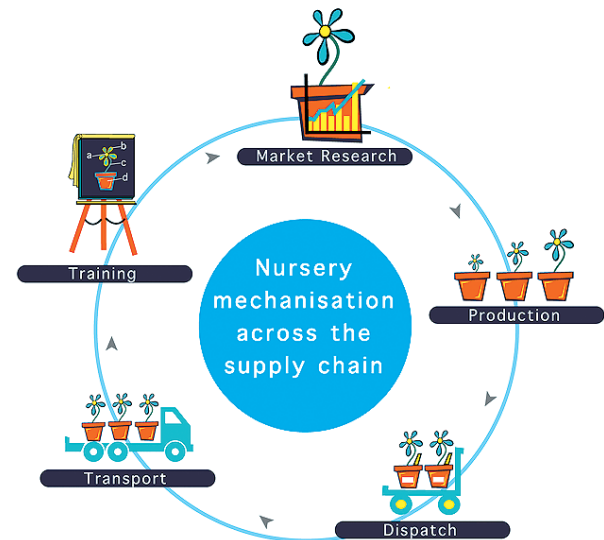
The research also recommended an Australian Standard Size for plant transport trolleys (approximately half-pallet - 1190 x 583 x 2000) and a national trolley interchange system to improve the efficiency of plant transport. In addition the project compiled a comprehensive database and printed a catalogue of nursery mechanisation equipment suppliers and manufacturers. For more information, the full research report, HRDC NY128 - Identifying opportunities for improvement of material handling and production efficiency in the

nursery industry, W. Radajewski 1994, is available from Horticulture Australia Limited (HAL), phone: (02) 8895 2300.

Reducing the labour costs of potting

Most nurseries can reduce total potting labour costs by improving some aspect of their potting production systems.

This project identified labour cost components of the potting operation, potting production inefficiencies and possible solutions,



benchmarks for the potting operation and a commercial potted plant handling system.

For more information, see *The Nursery Paper* 'Reducing the labour costs of potting', Issue number 2000/04. The full research report, NY98031 - Optimum work methods in the Nursery Potting Process, Queensland Department of Primary Industries, 2001, is available from HAL.



Dispatch

Industry surveys have shown that the cost of dispatching plants within the nursery industry varies considerably. In an effort to better understand why, and

to investigate efficiency improvements, a major research project was initiated and highlighted.

Savings in nursery dispatch

Nursery dispatch operations (i.e. receiving orders through to awaiting transport) are the most costly and labour-intensive part of production nursery business. Improved work practices, nursery layout and logistics can increase productivity and halve production costs.

For example:

- Average cost of labour for dispatching a 140mm pot was 36 cents (ranging from 21.66 to 51.81 c/pot) and introducing improved systems can save an estimated 16.23 c/pot.
- Picking plants from the field was the most inefficient dispatch operation (67%, or 7.65 cents/pot, potential savings possible).
- Detailing operations (labelling, staking etc.) were mostly efficient, but better organisation of detailing tasks could save up to 20% of time spent and 73%, or 26.61 c/pot, of costs.

Most inefficiencies stem from poor communication, inadequate planning and unrefined work practices leading to time wasting during production and excessive pot handling and travel throughout the nursery.

National trolley interchange system

The report suggested a national standardised trolley interchange system for wholesale and retail nurseries and plant transporters.

Using industry standard trolleys could save nurseries up to 15.2 cents per 140mm pot.

Pot standardisation for the industry

The research recommended standard pot, tray and trolley dimensions for optimal nursery efficiency when introducing mechanisation.

Practical ideas for increasing efficiency

Detailed advice and guidelines on improving nursery layout, logistics and quality control in a mechanised nursery were also developed.

In addition, a manual and video was produced detailing cost savings, alternative dispatch methods, problems and solutions, marketing strategies, dispatch designs and performance evaluation forms for nursery operators. Example order and dispatch forms are provided.

For more information, see *The Nursery Papers*; 'Savings in nursery dispatch', issue number 1996/03; 'Increasing Efficiency In Nursery Dispatch', issue number 1997/04; 'Reducing The Labour Costs Of Potting', issue number 2000/04. The full research report, HRDC Final Report NY403 Increased Productivity in Nursery Dispatch, Queensland Department of Primary Industries, 1999, is available from HAL.



Transport

Plants are difficult things to transport. They come in different shapes and sizes, have specific environmental needs, and are subject to quarantine restrictions. Two research reports highlighted the following.

Optimal transport temperatures

Maintaining optimal temperatures can prevent undesirable plant growth in storage, reduce respiration and help maintain stored carbohydrates.

A characteristic of the Australian nursery industry is the large amount of transported nursery product. For example, about 60% of nursery products produced in Queensland are marketed interstate, 90% of which are transported by road to their destination.

While potted foliage plants are less sensitive to transit temperatures than potted flowering plants, the study recommended environmental controls be introduced in carriers in spring and summer when most plants are transported and most temperature extremes occur.

Optimal transport temperature to maintain the quality of two potted flowering plant species, *Dipladenia samderi* 'Red Riding Hood' and *Bougainvillia* 'Penelope' is 10°C.

For potted foliage plant species, *Ficus benjamina* 'exotica', *Dieffenbachia* 'Camille' and *Chamaedorea elegans*, optimal transport temperatures are 10°C-15°C. Above this range, plant quality is reduced by chlorotic foliage and foliage loss.

Foliage plants shipped for long periods at 18°C. enabled growth, but there was no light. The result was yellowing of newer terminal foliage and, for ficus, loss of lower foliage. Plants placed in the dark for longer than their normal darkness cycle use their food reserves - temperature increases exacerbate this trend.

Temperatures below 7°C for long periods or from 2°C - 5°C for short periods can cause chilling injury - chlorotic or yellow spots on leaves or leaves/stems appear water soaked. Chilling injury appears as brown, water soaked or blackened tissue two to five days after transit.

Water stress from high temperatures (30°C - 40°C) leads to plant weight loss and quality loss through desiccation and leaf drop. Desiccation rate is influenced by plant growth rate, water-holding capacity of the media and temperature. Potting media should allow good drainage but retain moisture during transit.

For more information, the final report HRDC NY023 Role of temperature in maintaining plant quality during interstate road transport, K. Jacobi, 1996, is available from HAL.

Supply chain analysis

This project defined the supply chain and looked at ways to create efficiencies. The supply chain is defined as inputs supplier, grower/manufacturer, wholesaler, retailer, and consumer. Inputs refer to media, young plants (cuttings or plugs), pots and fertiliser.

Product distribution from wholesalers to retailers currently involves a lot of multiple direct-to-store deliveries. A need exists to consolidate facilities or services to a single point for forwarding (called cross docking) to retailers. Other products to

retailers could also be in the delivery set up.

E-commerce supply chain efficiencies include: reduced administration costs through less paperwork, lower cost of holding inventory by improved order turnaround, faster response time frames due to speed of electronic communications, capture of trading data for future planning.

For more information, the full research report HRDC NY97047 - Nursery Industry Supply Chain Analysis - RETAILworks, 1998 is available from HAL.

Potential savings in freight handling

Some of the largest gains in freight handling costs across the supply chain can be made when E-commerce is linked to transport. Gains from improved freight efficiency for greenlife and electronic processing of invoices and freight consignment notes are estimated at \$14.95 million a year. These savings represent 1.56% of the wholesale value of greenlife.

Cost-cutting opportunities for wholesale nursery operators include using specialist freighters rather than owner-operated, technologies such as bar-coding and internet E-commerce and a modular system of freighting units that improve efficiency and resolves work cover handling concerns.

For more information, the full research report, HAL NY99038, Nursery Industry Supply Chain Project: Plants, Trucks, Computers and the Internet - Can we get them together? RETAILworks, 2001, is available from HAL.



Training

Many private training providers are now actively servicing the nursery and garden industry offering on site, flexible and competency based training and assessment.

The nursery and garden industry has developed a variety of flexible training courses including: safe handling of pot media, composts and other organic material, waterwork, managing plant costs in production nurseries and managing plant costs in garden centres, nursery research, nursery dispatch and NIASA accreditation.

For more information, contact the relevant development officer at your state nursery and garden industry office.



Market Research

Producing something will not be efficient in a business sense if the market does not want to buy it. Knowing what the market wants is a vital component of any efficient business. Several market research projects are funded by the nursery industry products levy. If your business is not utilising the information gained from these projects, your business efficiency may be compromised.

Commercial buyers of greenlife

This study researched commercial plant propagators, hire/rental companies, landscapers and retailers and found that:

- Value is associated with quality of the genetic stock, plant consistency, strength, durability and longevity. However, different customer groups had varying needs, with retailers being more concerned with standardisation, appearance and customer acceptance.
- Supplier selection was determined by plant condition, health, appearance, quality; consistency/reliability of plants; product range/size; staff quality/knowledge; price/value for money; personal aspects of service.
- Damaged plants and unreliable delivery were the main reasons for changing suppliers.

For more information, see *The Nursery Paper* 'Greenlife Buyers survey - quality and service worth \$' issue number: 2000/09. The full research report, HRDC NY98048 - An analysis of information needs in the nursery industry, Mark Dignam and Associates, 1999 is available from HAL.

The Australian Garden Market Monitor

The total value of the Australian garden market for the year ending 30 June 2002 grew to \$5.42 billion. The café and gifts product category and the landscaper distribution channel experienced considerable growth when compared with the previous year showing a 35% and a 22.9% growth respectively.

Growth in Greenlife category sales varied - for retail nurseries 4.9% growth, hardware stores 8.3%, discount department stores 18.2% and landscapers 20.1%.

For more information, see *The Nursery Paper* 'Growth of the nursery and garden industry', Issue number: 2003/02. The full research report NY01013 - The Australian Garden Market Monitor - RETAILworks is available from HAL.

Show me the money consumer monitor

Regular consumer surveys, combined with regional demographic data, provide valuable information on consumer trends.

Individual regional market intelligence reports are available and give valuable information on the types of gardening customers in certain areas, where they shop, what influences them and what opportunities they represent.

For more information, see *The Nursery Paper*; 'Market Research Information for your business' issue number 2002/10. The full research report: HAL NY00032 'Show me the Money' Consumer Monitor 2001 the latest trends, Creative Dialogue, is available from HAL.

The bottom line

Efficiency and mechanisation improvements for the nursery and garden industry are continually being researched. Usually full reports are produced and summarised and published in industry communications, such as *The Nursery Papers*.

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