

Using Plant Propagation Technology for Improved Plant Marketing[®]

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INTRODUCTION

A definition of technology as it applies to nursery producers might be: "The practical application of science to commerce or industry." The word science comes from the Latin *scientia* meaning knowledge. Therefore in essence the title of this paper is simply the application of propagation knowledge to improve plant marketing. We can sometimes be blinded by words that appear more involved than they were meant to be when first devised. Technology is useless unless it results in ease of use.

The motto "To Seek and Share" is quite appropriate and in fact much of what the IPPS stands for is directly relevant to the use of technology for improved plant marketing. The purpose of this paper is to make a few practical suggestions based on our experience, working on our own, in an area where vast amounts of knowledge lay hidden in tomes of research papers.

Plant science is too vast an activity for us as a commercial nursery producer to explore in any major depth. Plant science research can create distractions which give little or no short- to medium-term benefit to a commercial nursery. Such distractions are potentially rewarding to mankind and to industry generally in the long-term if our businesses live long enough to reap the reward. Many activities undertaken in plant research are not beneficial to nursery producers within the time frame they have to bring commercial viability to a business activity. This is not to say that some projects do come in on time and give profitable benefit to the grower.

As nursery producers by commercial necessity we need to confine ourselves to what is generally known as applied science. To achieve the best results collaboration with the specialist scientific community is essential. Systems, knowledge, and research findings have been developed by advanced scientific research over decades. This knowledge is used by applied scientists to great effect and forms the building blocks for us as propagators. Two barriers to unlocking this tremendous resource are firstly scientists' understanding of what we need and secondly our own ability as plant producers to articulate our priorities effectively. Both barriers can be overcome by transfer of knowledge and mutual understanding of the limitations on both sides.

If it is accepted as a logical argument that best use of future and present horticultural R&D resources is through making the most of what we already know, then co-operation between nurseries and the scientific community is essential. Co-operation is a two-way process so the widest meaning of the word "technology" needs to be respected and understood. Knowledge development is not the exclusive domain of what we know as scientific research.

It may be damaging for most growers to invest too much time in amassing information and knowledge which cannot be applied to their core commercial activity. This is not to take away from the personally rewarding knowledge the study of plant science can bring but if staff or management are to invest company time

then relevance is the order of the day. If research using technology is to be undertaken for commercial growers then the limitations and needs of the grower must be an equal consideration to the curiosity of the scientist, assuming the research is funded for medium-term profit.

THE NEED FOR TECHNOLOGY TO IMPROVE PLANT MARKETING

Bringing a new plant product to the market usually involves many horticultural businesses working on the plant or product in relay:

Breeder > Propagator > Grower > Distributor > Retailer & Landscaper > Consumer

Each element has its own technological needs and each step in the process depends on the other — good breeding makes the propagator's life easier and with good propagation the grower's life becomes easier. Grower and propagator can be the same or separate businesses but it is essential that the process actions are planned to take account of the needs of the other participants in the whole process.

Even accounting for the current recession, the size of the market for ornamental plants is increasing and becoming more diverse, the retail chain challenges becoming greater and the consumer continually looking for excitement through new plants. Another change taking place is the trend in all countries towards urban living in smaller spaces. We now see rooftop and wall gardens and this new departure brings opportunities and challenges to the types of plants and the environment in which they will be grown. Plants must fit in with the built environment and we are going to see the greater use of hydroponic and rock-wool systems by domestic gardeners as well as by landscape designers and architects. So new technology will be required to support the supply of plants to be used in new ways in our living spaces.

The philosopher Eric Hoffer said: "In a time of drastic change, it is the learners who inherit the future. The learned usually find themselves equipped to live in a world that no longer exists." Are we nursery owners and managers learning enough from the learned, are the learned fully informed of the changes that are taking place in the market and the needs?

THE USE OF TECHNOLOGY TO IMPROVE PLANT MARKETING

The following are common technologies used by scientists and growers to improve plant performance and develop new cultivars:

- Micropropagation
- In-vitro plant breeding
- Virus and bacteria cleaning
- Conventional plant breeding
- Plant growth regulation
- Soil science
- Greenhouse design and technology

Most growers only have access to micropropagation technologies by collaborating with scientists through commercial laboratories or government-funded institutions. Many nurseries have developed their own laboratories for initial production of mother plants. This is a difficult undertaking for a nursery and access to the correct skills is essential from the start. Before investing in equipment or materials it is essential to have a dedicated individual to oversee all operational and research

processes. All of the first three activities in the list above can be provided by commercial laboratories, which may be more cost-effective than building your own.

There are many forms of technology which can be out-shone by apparently higher-tech activities, such as the first three in my list, yet are just as useful and effective. More focus at horticulture education level on plant breeding and the use of common and less-common plant growth regulators, for instance, could prove immensely beneficial to employers in the long term.

Experience With the Use of Micropropagation. As a nursery business our experience of this form of propagation technology goes back to 2005 when we took over an existing micropropagation laboratory, Plant Technology Ltd. This journey has been simultaneously exacting and rewarding. In addition to basic production from plant tissue culture we have gained a lot of insight which can only be learned by working closely with a scientist. In-vitro propagation offers many interesting insights into how a plant works and observation of the plant in-vivo can give explanations to the micropropagation specialist as to how the plant is reacting in culture.

It is not the intention of this paper to deal with the processes and disciplines involved in plant micropropagation but to share some fundamental lessons learned.

Micropropagation technology offers many tools to the grower but also apart from technical risks has business risks. My experience is limited to the use of micropropagation for propagation, bacteria cleaning, new product development, and mutation breeding. We have used this technology to develop our own new plant selections, ensure supply volumes meet market demand, and to clean new plant cultivars to help ensure rapid production of cutting material.

During the course of running our own laboratory for these purposes opportunities to work with other growers and breeders have led to development of a wider product range. We now work with a number of other private laboratories. For our purposes this is the most efficient way of using plant micropropagation technology and introducing new plants to the market — it combines the grower's eye for a good plant with the knowledge of the plant scientist. It is a collaborative process and must combine various people skills to be successful. Any further detailed plans on how to use technology to the propagators advantage in marketing must take into account that this fundamental collaboration is possible.

Table 1. Strengths and weaknesses of micropropagation as a nursery technology.

Weaknesses	Strengths
Highly trained staff requirement	Highly trained staff achievements
Setup costs	High barrier of entry for competitors
Cost of maintaining a viable production unit	Exclusive product opportunity
Failures due to contamination or system failure	Product development opportunities
Intensive focus required	Plant breeding / selection opportunities
Long run-in time for returns on investment	High value nursery products

THE WAY FORWARD

To make more use of plant technology for improved marketing it will be essential that private businesses invest in research. If state resources can be used to match industry funds then more projects can be worked on. Each partner in the process must have practical and accountable influence on projects, timelines, and outcomes. From our experiences in endeavouring to complete our own plant research projects it is evident that there are tremendous benefits to be had by way of improved production, exclusive product development, and more marketable product ranges.

The burden of product development on a small business is not to be taken lightly and in an ideal world would be shared by a group of like-minded businesses. To share this workload it is essential that each party will have profit from the technological improvements or developments to the end product. It is essential that a percentage of profits and/or royalties is identified to be put back into the technology processes and updating of equipment.

Most governments have decreased their R&D support for horticulture and more and more it has become the responsibility of horticultural businesses to fund their own research and product development. If our industry is going to use technology towards improved plant marketing in the future we must make the colossal bank of knowledge that already exists work better for us.

Much of the technological knowledge we need is already there but many of us are unable to use it in a practical manner due to barriers in translation and application techniques. The gap between scientific, academic, or student communities working in areas of plant science needs to be bridged in order to release the true potential plant technology can give to plant marketing.

If smaller nursery companies are to develop their own competencies — which are often the preserve of larger companies — they must identify the most practical technology that can help their marketing. They must then find a way to access this technology, but each business must identify its own route. The certainty is that the use of technology does improve plant marketing; the uncertainty is how it will affect the bottom line and how quickly this improvement will be achieved.