DO-YOUR-OWN-RESEARCH IN THE NURSERY INDUSTRY

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Summary. The need for much simple, specific (vs generic) and statistically sound research is identified in the nursery industry. The feasibility of harnessing the latent capacity that resides within the industry itself of carrying out the bulk of this work was examined in an action learning and participative way (PAM model) with 14 industry operators. In view of their high success rate (12 out of 14 projects successful) and strong support, we have concluded that this capacity can be readily exploited following one to two days of training and on-going consultative support.

INTRODUCTION

The nursery industry of Queensland, (GVP $250 million) is characterised by a large diversity of species (>4500) and many environments (full sun to full shade, geographically diverse). A wide range of potting media is available with infinite variation in composition, chemical amendments and fertilisers being used. Water is applied from above and below. Enterprises are mainly small to medium in size.

Most of the plant husbandry is based on imported information. Generic research is carried out by public institutions. However, without specific qualification such information is not greatly valued by individual operators. Informal experiments, carried out by operators themselves, are rarely based on objective data that is statistically sound. Because of cost, consultants are rarely hired to do research.

We report briefly on a project in which we examined the industry's own ability to carry out simple yet scientifically rigorous experimental work with minimum supervision. Chamala's (1) Participative Action Model provided the basis of operator involvement in two workshops and operator conducted research work. We outline the content of a Do-Your-Own-Research (DYOR) training course manual and the complementary role that a consultant is likely to play in DYOR.

MATERIALS AND METHODS

The aim of the project was to assess, following some basic training, the capacity that nursery operators had to carry out their own *fine-tuning* research work. It was also intended to establish what form that basic training would take and what supportive role the consultant had in the DYOR process.

The project personnel consisted of three extension horticulturists, one research agronomist, one extension academic, one biometrician, one economist, two practising industry representatives, and a student observer(*core group*).

A brief outline of the project was circulated to all subscribers of the QNIA monthly magazine, the *Leaflet* in August 1994, (2) with an invitation to them to fill out a questionnaire and be part of the project if selected. On the basis of information supplied, we selected 15 nursery operators *(industry group).* Prior to the first workshop a multifactorial demonstration experiment was commenced for use by the operators in the first workshop. The initiation and progress of the project has been reported by Lake (3, 4).

Agenda of first workshop, Nov. 1994. Introduction to DYOR; feedback on questionnaire; contents of DYOR starter kit; group ratification of proposed agenda; participants' expectations; demonstration experiment- growth assessment and plant weights; introduction to statistics; introduction to GrowSearch ornamentals database; video presentation *Nursery mechanisation*; industry group project selections; analyses of data from demonstration experiment; outline of proposed projects; reflections on day's proceedings; expectations for next 7 months; conclusions and close.

Proposed DYOR experiments. The industry group proposed a total of fourteen projects. Aspects covered nutrition, media management, water use efficiency, pot design effects on roots, propagation, disease control, and varietal performance.

Five members of the *core group* provided consultancy support in the design of these experiments. The physical on site implementation of each experiment, in terms of setting up, maintenance and data collection, was the sole responsibility of members of the *industry group*. Data were forwarded to each consultant for analysis and preliminary interpretation. Final recommendations and follow up was developed collaboratively.

A second questionnaire was sent out to the *industry group* 4 months after the first workshop while part way through their own project.

Agenda for second workshop, July 1995. Introduction and recapitulation; critical incident report from both *core* and *industry groups*; problem solving group activity; statistics, experimental design and techniques; future directions for DYOR.

RESULTS AND DISCUSSION

Outcome of experiments. Twelve of the 14 experiments have progressed satisfactorily. Some operators are already claiming financial gain as a result of DYOR. Such a result not only reflects a high level of commitment by the industry operators but also their ability to satisfactorily implement the guidelines provided by their respective consultants. Comments from operators suggest that in the current climate DYOR is a most attractive way to progress research work. We are able to conclude that DYOR is a feasible and practical solution to generating *fine-tuning* research information. In essence, DYOR will become the source of new information for the nursery industry but its potential value will only be realised if such information flows freely throughout the industry. Facilitating and enhancing this flow needs urgent attention. .

The process used. The success of the DYOR project may also be attributed to the use throughout, of the principles of Action Learning cycle of *plan, do, observe, reflect* (5), and the implementation of the Participative Action Management model of *stakeholder and facilitator, key issues, focus, review, adaptation, adoption* (1). The process we adopted encouraged *active* participation by all stakeholders as equal partners in the project, their *empowerment* in a cooperative *interdependent* mode with their consultants, resulting in a high level of personal *ownership* and *understanding* of the principles of DYOR.

The DYOR implementation cycle. The outer lower half cycle (Fig. 1) applies to those circumstances where the logistics, scope and necessary resources needed for the conduct of the experiment fall outside the capability or capacity of the operator's enterprise. Such experiments may be referred to other agencies. The upper cycle short circuits the *full* cycle when information from existing literature allows the formulation of immediate recommendations. The boxes are coded by line type to indicate activities undertaken by either the operator or the consultant or co-jointly. From our limited experience, we estimate that each experiment would require a total of 10 to 15 hours of consultancy support.

Figure 1. The Do-Your-Own-Research implementation cycle.

DYOR courses. The DYOR implementation cycle will form the basis for the DYOR industry operators' training course. The steps in this cycle will provide the course content. A DYOR consultants awareness course is also being developed.

Responses to questionnaires. Production and wholesale nurseries were the most highly represented group. Of the 70 respondents to the first questionnaire, many carried out their own informal research work. Many of their selected research topics (media, nutrition and propagation) seemed amenable to DYOR. Consultants were only hired by 10% of the operators to do experimental work.

Eleven of the 14 project participants responded to the second questionnaire. Eight ranked the potential value of DYOR as high to very high. Four had some confidence in their own DYOR ability while six rated it highly. Since the start of the project their enthusiasm for the concept had not waned at all, with two becoming even keener. All respondents indicated that they will complete their projects, even though almost half were behind schedule. Ten respondents considered that consultancy support was adequate. Most projects changed slightly following consultancy advice, because the original was either too time demanding or too complex. Almost half the respondents attributed a lot of value to relevant information gained from the GrowSearch database. Seven operators thought that the successful outcome of their experiment would add considerable value to their nursery operation.

Participants view of DYOR. Participants greatly valued the provision of the research starter kits (pH, EC meters, cylinders, scales and books). They developed an eye for detail, and became more aware of research opportunities. They valued research more and appreciated the effort involved. Even horticulturally qualified operators benefitted from DYOR particularly in the area of statistical analysis. DYOR promoted the the sharing of information through group participation and confidence in the quality and context of the information produced. Some specific research solutions may already exist in the literature. When approached in a *friendly* way, statistics were seen by operators as powerful tools to be used in resolving their own problems and not just the domain of blackbox science. When statistically significant gains, across the production chain, of as little as 5% are added together they do so in a compounding way, resulting in substantial total gain. Experiments should be kept as simple as possible and carefully selected for their potential to give high benefit/cost ratios. Proposed experimental work must be included as part of the overall enterprise budget.

Other insights. It is essential to complete the pre-schedule check list. The experimental site must be checked for variations in light and draughts and especially for evenness in irrigation. Media and fertility levels must be uniform. Considered essential to get staff involved, explaining to them what needs to be done. Stock should be graded according to replicates or blocks, but not treatments. Data must be collected carefully and on a timely basis, stored in an accessible and permanent form, and be based where possible on objective measurements. The details of any mishaps must be recorded as they may prove crucial to the appropriate interpretation of the experiment.

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