

VegBIZ -Vegetable Enterprise Decision Support Systems

Gerard Kelly
NSW Department of Primary Industries

Project Number: VG08021

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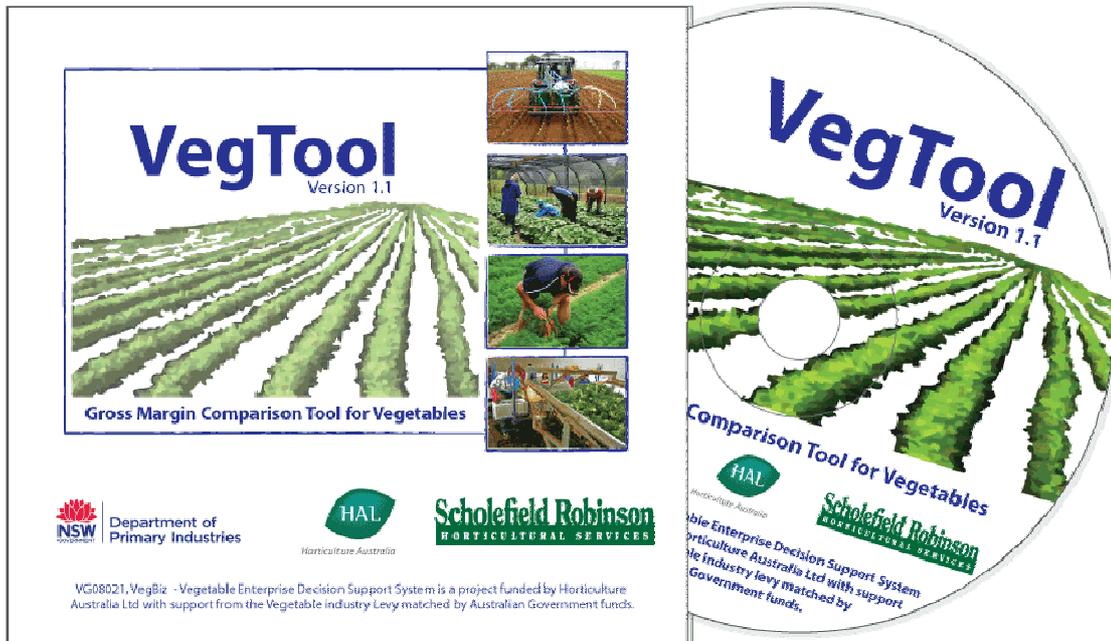
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FINAL REPORT

VegBiz Vegetable Enterprise Decision Support Systems

VG08021

Prepared for: Horticulture Australia Limited (HAL)

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**Department of
Primary Industries**

HAL Project Number - VG08021

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Purpose of the report:

This final report has been prepared to document the process, outputs, outcomes and evaluation of the project VG08021 VegBiz Vegetable Enterprise Decision Support Systems.

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Media Summary

The VegBiz project developed and delivered a financial decision support tool to the Australian vegetable industry. VegTool is a grower friendly cost of production calculator that generates figures about income, growing costs and gross margins for vegetable crops. Scenarios for different crops and management practices can be developed, saved, compared and interpreted. VegTool financial reports and program functions can assist growers' decisions about crop production and management practices and provide users with opportunities to improve their financial understanding of growing costs and returns. The primary audience for VegTool is Australian levy paying vegetable growers and industry professionals who have contact with vegetable growers.

Awareness of VegTool and its benefits were raised through media articles, field demonstrations, workshops, conference presentations, websites and publications. Training and support materials were developed for the delivery of information at industry and field events. VegTool information is available at several industry organization websites including the AusVeg, (Peak Industry Body of the Australian vegetable industry) website.

Information and training activities were conducted in all Australian states. These were attended by growers, researchers, rural support workers, commercial service providers and industry development officers. The VegTool functions were demonstrated and interpretation of financial reports discussed. Several crop scenarios which compare different vegetable management practices were presented and the impact on operational costs and gross margins explored. These examples demonstrated how VegTool can be utilized for making crop and farm management decisions.

VegTool CD's were distributed at field events, by direct mail and downloads at the Ausveg website. The uptake of the program was most successful where there was direct contact with growers. A series of vegetable crop gross margin budgets were also developed and published to compliment VegTool activities.

Evaluation of the project indicated that VegTool suited the needs of vegetable growing businesses. Many growers reacted positively responding that it was specific for vegetables and it enabled them to calculate and record their production costs and make decisions based on VegTool financial reports. Industry professionals are strong advocates of the program and many are utilizing it extensively in their service delivery to growers.

Technical Summary

Nature of the problem

The VegBiz project, addresses the vegetable industry priority:

The development of an 'on-farm' bottom line analysis program that is user friendly (Vegetable R&D levy 2008 priority)

Describe Science undertaken

VegTool is a grower friendly decision support tool that calculates the potential income, growing costs and gross margins for vegetable crops. VegTool was developed specifically for the Australian vegetable industry because there was no other specific tool available. VegTool financial reports and the program's functions can assist management decisions and provide users with opportunities to improve their financial understanding of production costs and returns.

Information and figures about crops, yields, prices, growing practices, application rates, labour activities, packaging, transport and marketing are entered. The program calculates production costs and gross margins and produces financial reports. Scenarios for different crops and management practices can be developed, saved, compared and interpreted.

Awareness about the availability and benefits of VegTool was communicated through media articles, field activities, workshops, conference presentations, websites, publications, webinars and individual contact. Demonstration and training activities were conducted in all Australian states. There was attendance by growers, researchers, rural support workers, commercial service providers and industry development officers.

This project incorporated several modifications which helped enhance growers' use of VegTool. A printable workbook was prepared to assist growers with limited computer experience and video tutorials were incorporated to guide users through the program. VegTool functions were upgraded to include graphic representations of financial reports to help growers easily interpret data.

VegTool information is available at AusVeg, NSW DPI and various vegetable organization and state farmers association websites. Over 400 VegTool CD's were distributed at field events, by direct mail and website downloads.

Major research findings and industry outcomes

Reviews highlighted both positive and negative feedback. Positive responses about the program were: *"simple, versatile, various options for calculating costs and selecting units and products."* Additional benefits that were highlighted include: *"VegTool is excellent to review crop financial performance, test crop gross margins, plan future cropping programs and explore the costs and returns of changed management practices."*

The negative feedback included: *"the program is too simple, a lot of information needs to be known prior to using it, there needs to be more selection options for cost calculators."* Some experienced growers found the program less useful because they already knew their costs and gross margins. Some older growers thought that using a pen and paper was easier.

Raising the awareness of VegTool was considered to be successful as there were regular telephone and email enquiries requesting the program. Almost all recipients stated that they obtained a copy of VegTool because they had heard or read about it and that they thought it would be good because it was tailored specifically for the vegetable industry. Industry professionals also indicated that they were keen to incorporate any tool that might help them to help their clients.

The utilization of VegTool by those who obtained the CD was lower than initially expected as not all growers who received a copy reported using it in their business. Those who had used the program found it beneficial and had used it to make decisions about crop production. The majority who used VegTool were enthusiastic about its functions to calculate costs and gross margins and compare different scenarios.

Contribution to new technology

A series of fourteen updated vegetable crop gross margin budgets were developed and published in 2013 at the NSW DPI website to compliment VegTool. This will meet regular demand from growers and financial specialists who seek economic information when considering farm development proposals.

Several case study scenarios which compare different vegetable crop management practices were also prepared and demonstrated at industry events. The scenarios demonstrate the financial impact of different practices on other production costs and final gross margins.

Recommendations to industry, research peers & HAL

VegTool will continue to be available to the vegetable industry through Ausveg and the NSW Department of Primary Industries. Other agencies providing on-line links can continue to support to VegTool through their websites which help maintain awareness of the program. Industry professionals can continue to encourage use of the program through their services with growers and by word of mouth.

Suggested future work

Future development of VegTool is dependent on funds. Individual cost calculators in the program such as the 'Water', 'Electricity/Gas' and 'Other' could be modified to improve their content. Further technical development could be to create on-line or downloadable calculators or 'stand-alone' apps for each of the cost calculators for use on mobile phones and tablet devices.

Introduction

Historical background

VG08004 'Grower-friendly tool for comparing management and profitability of vegetable crops' was a vegetable industry funded project managed by Scholefield and Robinson Horticultural Services which developed the VegTool 1.0 program. VG08021 'VegBiz Decision Support Systems' is a subsequent project that was charged with disseminating VegTool, to the vegetable industry.

Initially there were a series of communications and meetings with Lauren Thompson and Alison MacGregor, staff from Scholefield and Robinson Horticultural Services, the company that conducted project VG08004. This allowed the background from that project to be established and transition to project VG08021 to occur.

The VegTool program operates from a Microsoft Access platform. It was produced as a CD, a format which was reinforced throughout the VegBiz project. This format was preferred rather than an on-line format which many growers commented they did not prefer.

Significance to the industry

The VegBiz project, addresses two vegetable industry issues and priorities:

- AVIDG Strategic Imperative 4.3 "Improving technical, business and financial information services" with the related rationale "Access to quality information when it is required and in a format that supports effective decisions is fundamental to the effective performance of the industry and its participants." (Vegvision 2020)
- The development of an 'on-farm' bottom line analysis program that is user friendly (Vegetable R&D levy 2008 priority)

The VegTool program allows users to calculate gross margins for vegetable crops and provides a quick and easy way to assess the potential gain or loss of a particular crop or set of growing practices. The figures and information entered into VegTool are used to calculate gross income, operating costs and gross margins and produce financial reports. These summaries can be previewed, printed and saved to be later modified if required.

Growers can use VegTool financial reports to review the costs of their current growing practices or those being considered for future crops. VegTool can assist making decisions about introducing improvements by exploring the associated costs and benefits involved.

The capacity of VegTool to assist growers' knowledge about profitability of their vegetable businesses is dependent on the users and the myriad of other factors impacting their operations. It is expected that VegTool will be one of the many resources that they utilize for the financial and agronomic management of their farms in the future.

Review of Literature

Anecdotal evidence suggests that many vegetable growing businesses face challenges of managing increasing costs, stagnant market prices, decreasing returns and increasing debt. Often additional areas are planted to vegetables by current and new farmers in a speculative approach to earn more income from vegetable growing. This regularly leads to periods of over-supply of domestic markets, depressed prices and threatens the viability of some vegetable farmers.

A review of vegetable industry statistics highlighted the many challenges the industry faces. ABARES reports show that over a four year period from 2007 to 2011 prices for a selected group of vegetables increased an average of 18.6%. However, in this same period, costs of production per

tonne for the same vegetables increased by an average of 60% (ABARES, various years). These figures emphasize that whilst the prices received for vegetable crops are increasing, the cost of growing these crops is increasing at a greater rate.

Studies of the financial performance of Australian vegetable farms also showed a slight decline over the same four year period with farm cash income falling by 2%. During the same four year period there was an average increase of 30% of Australian vegetable farms recording negative farm cash incomes whilst the profitability of vegetable farms decreased by an average of 35% (ABARES, various years). This trend suggests that vegetable farmers need to focus on the financial performance of the farming operations and enterprises in order to remain viable and that perhaps one way to do this would be to use financial resources that help them achieve this.

In 2006 an audit of Australian farm software showed that there were 675 actively supported software titles, a three-fold increase from the last software audit conducted in Australia (Reynolds, 1999). A brief search for software resources for horticulture industries revealed there were tools available for helping with finance, agronomic and environmental decisions. The array of tools included those for irrigation use and water requirements, machinery operation, fuel use, carbon, farm greenhouse gas emissions, tractor operations and implement costs, farm expansion and pest management. Published at the Ausveg website, there were several InnoVeg Business Cases and calculators specific to vegetables that explore the financial aspects of farm management (Horticulture Australia Limited).

With the development of computers and the associated software it can be argued that they will increasingly contribute to farm management. The benefits of using decision support tools to assist farmers' business skills and the profitability of their farm businesses has been extensively researched.

Nuthall (1999), reports that the development of computerised decision models assist the quantification of specific and measurable objectives for farmer's choices. Farmers are known to take computer simulations seriously when they represent specific local management issues and the simulations pass their tests of credibility. Carberry et al. (2002), suggest that when farmers are convinced the model is accurate in a 'known situation,' they are keen to explore alternative options.

However Malcolm (1990), suggests that despite all the research and development on a wide range of decision models and systems, the farmers of today still largely rely on intuition, experience, and simple budgeting. Nuthall and Benbow (1998) cited in Nuthall (1999), also reported that while more farmers are using computers they only use them for basic management support and that software is not being found useful at a higher level. This is likely to continue as farmers tend to be reluctant to hand over control to systems they are not fully conversant with (Nuthall, 1999).

Thus whilst farmers might be reluctant to utilize a stand alone computerized decision support program for management decisions they might be inclined to use a tool which is simple and uses their own information to improve their farm budgeting. VegTool is a decision support tool that can customize financial and agronomic information for individual vegetable farms and be used for decision making.

Aims of the project

The VegBiz project was conducted in three stages:

Stage 1: Rapid Evaluation of VegTool

Stage 2: Raise awareness of VegTool and develop materials to assist its uptake

Stage 3: Distribute VegTool to industry and deliver assistance to users

The first stage conducted a rapid evaluation of VegTool 1.0 developed by VG08004. This field tested the program for its functionality and suitability for users and the industry. The feedback received

enabled some modifications to be incorporated into the program to improve its operation, versatility, access and utilization by industry.

The second stage developed support materials and raised awareness of VegTool. Media articles were published in various horticulture publications and at industry websites. There were radio interviews, conference presentations, meetings with industry professionals and webinars.

The third stage distributed VegTool to industry via a range of activities. There were training workshops for growers, displays at vegetable field days and horticulture conferences and demonstrations for individual businesses. Demonstration and training activities were attended by growers, researchers, rural support workers, commercial service providers and industry development officers.

Evaluations of VegBiz activities and outputs were conducted at many stages throughout the project and are reported in this document.

Technology Transfer Strategy and Methodology / Activities

Technology transfer activities were conducted throughout the project and used a range of methods across many locations (Tables 1 and 2). The activities included media articles, technical articles, radio interviews, conference presentations, webinars, vegetable field day displays and demonstrations, vegetable grower workshops, meetings with industry professionals, website publications and individual contact. A range of support materials were also developed to assist conveying information and advertising including brochures, banners, posters, a fact sheet, a video and a podcast. Vegetable growers were the main target audience for activities along with industry development officers, researchers and other industry professionals.

Activities had distinct purposes including creating awareness about VegTool and informing audiences about its functions and benefits. Participatory activities such as industry workshops and grower demonstrations were focused on creating experiential learning opportunities. These were structured to enable growers to learn about the VegTool functions, how to enter information and how to calculate costs and analyze financial reports.

Several VegTool case study scenarios were prepared to demonstrate the practical applications of the program for industry workshops. Each of these scenarios consists of a set of financial figures based on different crop management practices and shows the resultant gross margin. VegTool's 'Compare Scenarios' function was used to compare the financial outcome of these scenarios. This process and an interpretative description of the data helped increase participants' financial awareness and opportunities to make decisions about crop management practices. Case study scenarios were developed for comparing cropping, fertilizer and chemical programs and several water cost situations. They demonstrate how changing practices influence related production costs and were used to show how scenario comparisons can be interpreted in different ways.

VegTool incorporates several features that aim to facilitate and enhance growers' use of the program. A workbook was added to assist growers with limited computer experience and allow them to initially collate and prepare financial information at their own pace. They can then transfer the figures into VegTool to complete a gross margin analysis. The design of the workbook compliments the computer program and it is accessed and printed from within the program. There is an additional checklist within the workbook that informs users about information to be collated before commencing a financial analysis, thus facilitating preparedness for using VegTool. The workbook was also used as a training aid and to help growers become familiar with VegTool's content.

Video tutorials were incorporated into VegTool to quickly and easily guide users through the program. They provide instruction and demonstrate how to enter information at various stages. The four tutorials are - 'Learn How to Use VegTool Tutorial', 'Manage Scenarios Tutorial', 'Enter Crop Tutorial' and 'Enter Operating Tutorial'.

Financial reports were upgraded to include graphic representations of figures to help growers easily interpret data. These improve the program's versatility and allow users an alternative view to tables of figures. The 'Financial Summary' can be viewed as a pie chart graphic with the segments showing the values of the ten operating costs relative to the total cost. 'Compare Scenarios' can be viewed as a bar chart graphic with gross income, total operating costs and gross margin values, for each scenario being compared, represented as colored columns.

Later in the project a series of vegetable crop gross margin budgets were updated and published. The gross margin budgets prepared were for beetroot, capsicum, carrots, garlic, lettuce, potatoes (summer, winter, processing), pumpkin (butternut, Jarrahdale), sweet corn, zucchini, onions, rockmelon, watermelon and asparagus.

Tables 1 and 2 list and describe the technology transfer activities conducted by the project.

Table 1: List of publications

Articles

Kelly, G. NSW DPI (2011) *Counting the costs*. Vegetables Australia Magazine, Sept/Oct 2011, pp. 28-29

Kelly, G. (2012) *VegTool 1.1 aids vegetable management decisions*. Innoveg Newsletter, March 2012, pp. 4-5, published by the VIDP

Kelly, G. NSW DPI (2012) *VegTool 1.1 aids vegetable management decisions*. Grow NT Newsletter, Edition 1, March 2012, pp. 7 published by Northern Territory Farmers Association Plant Industries Magazine

Kelly, G. NSW DPI (2012) *VegTool 1.1 aids vegetable management decisions*. WA Grower Magazine, Vol.47, No.1, Autumn 2012, pp. 55, published by Vegetables WA

Kelly, G. NSW DPI (2012) *VegTool aids vegetable management decisions*. Focus on Farming, Area News (Griffith) June 2012

Kelly, G. NSW DPI (2012) *VegTool Decision support technology for the Australian vegetable industry*. APEN ExtensionNet, Vol. 19, No.3, pp5 – 6, June 2012

Kelly, G. NSW DPI (2012) *VegTool is user-friendly*. Agriculture Today, September 6, 2012

Kelly, G & Watts, S. (2012) *Vegetable gross margins using VegTool decision support tool*, Factsheet, Primefact 1264 first edition, November 2012
http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0006/457719/Vegetable-gross-margins-using-VegTool-decision-support-tool.pdf

Kelly, G & Watts, S. (2012) *VegTool Gross Margin Comparison Tool* (video and podcast)
<http://www.dpi.nsw.gov.au/agriculture/horticulture/vegetables/vid-pod-app>

Kelly, G., Watts, S. & Napier T. (2013) *NSW Vegetable Crop Gross Margin Budgets 2013*
<http://www.dpi.nsw.gov.au/agriculture/farm-business/budgets/vegetable>

Kelly, G., Watts, S. *VegTool "On Target in Agriculture"* radio interview Radio 2RG, 8th July 2012

Other publications

Victorian Vegetable Growers Association (2010) *Costing gross margins now made easier*. Vegetables Victoria Autumn Issue 40, 2010 p7 published by the Journal of the Vegetable Growers Association Inc.

Beveridge, R. Growcom (2012) *From the Vegie Info project Manager*. Vegie Info Newsletter, Vol.2, No 2, March 2012 published by Growcom

Houston, S. Vegetables WA (2012) *Software packages and smartphone apps for smarter farm management*. WA Grower Magazine, Vol.47, No.4, Summer 2012, pp. 28-30 published by Vegetables WA

Vegetables Victoria. *Gross Margins Using VegTool*
http://www.vgavic.org.au/research_and_development/vegetable_industry_development_program/gross_margins_using_vegtool.htm published by Victorian Vegetable Growers Association.

Ausveg. *Gross Margin Tool, VegTool 1.1 Grower friendly tool for comparing management and profitability of vegetable crops*, <http://ausveg.businesscatalyst.com/Default.aspx?PageID=3667793&A> published by AusVeg

Whitman H. Mildura (2011) *Growers meet about precision ag, gross margins and alternatives to dimethoate*. Vegetables Victoria Summer Issue 46, 2011 p8 vgavic.org.au/pdf/Vegetables_Victoria_46_Dec_11.pdf

TFGA http://www.tfga.com.au/index.php/download_file/view/99/480/Gross_Margins_-_Using_VegTool_LR.PDF?file=Gross_Margins_-_Using_VegTool_LR.PDF

BFVGA <http://www.bfvga.com.au/index.aspx?page=41&nid=87>;
<http://www.bfvga.com.au/admin/uploads/VegToolBrochureemail.pdf>

Table 2: List of VegBiz Technology Transfer Activities

Activity	Date	# Participants
Conference Presentations		
APEN National Forum, Armidale, NSW	28–30 November 2011	45
Hydroponic Farmers Federation, Ballarat, VIC	18-20 July 2012	55
Australian Cucurbit Growers Forum, Cowra, NSW	26-27 September 2012	45
Vegetable Grower Workshops and Meetings		
WA Brassica Growers Workshop, Bunbury, WA*	July 2010	12
Sunraysia Vegetable Growers Workshop, Mildura, VIC	30 September 2011	23
Riverina Vegetable Workshop Griffith, NSW	4 November 2011	18
Vegetable Growers Business Skills Workshop, Stanthorpe, QLD*	15 November 2011	22
Bowen & Gumlu Vegetable Growers Workshops, Ayr QLD*	March 2012	45
Vegetable Growers Business Skills Workshop, Gatton, QLD*	8 November 2012	25
TFGA Vegetable Council Meeting, Deloraine, TAS	13 June 2012	22
NTHA Vegetable Council Meeting, Darwin, NT*	20 August 2012	20
Demonstrations to individual Vegetable growers	Various	40
* includes facilitation by local representative		
Vegetable Industry Field Days		
Sunraysia Horticultural Field Days, Mildura, VIC	29-30 May 2012	64
Riverina Horticultural Field Days, Griffith, NSW	11-12 May 2012	27
Australian National Field Days, Orange, NSW	16-18 October 2012	26
Riverland Horticultural Field Days, Bamera, SA	19-20 September 2012	53
National Vegetable Expo, Werribee, VIC	2-3 May 2013	33
Industry Professionals' Contact		
NSW Vegetable industry professionals, Richmond, NSW	28 September 2011	6
NSW Farmers, Sydney NSW	29 September 2011	2
Growcom, Brisbane, QLD	14 February 2012	7
BFVG, Brisbane, QLD	15 February 2012	2
BGDGA, Brisbane, QLD	16 March 2012	3
TFGA, Devonport, TAS	14 June 2012	2
NTHA, Darwin, NT	10 July 2012	2
Vegeatbles WA, Perth WA	6 August 2012	1
NSW DPI Rural Support Workers Webinar	15 December 2011	5
VegTool Webinar	26 June 2012	4
Women in Horticulture Webinar	26 September 2012	5
Commercial suppliers	various	35
VegTool Distribution		
Field handouts & mail delivery		412
<p><i>Note: VegBiz contact with the following industry representatives - NSW Farmers (Alison Anderson), Growcom (Rowena Bevridge), BFGA (Bundaberg Fruit & Vegetable Growers, Peter Hoskings), BGDGA (Bowen & Gumlu District Growers Association, Denise Kryomberg), TFGA (Tasmanian Farmers & Graziers Association, Andrew Heap, Nick Steele), NTHA (Northern Territory Horticultural Association, Kate Peake, Grant Fenton), Vegeatbles WA (Sarah Houston), DEEDI (Clinton McGrath), WA Dept of Food & Agriculture (Peter Gartrell).</i></p>		

Evaluation of measurement of outcomes – impact and adoption

Evaluations of VG08021 occurred at several stages throughout the project and included telephone interviews, an online survey, recording of observations and feedback and responses to questionnaires.

Feedback early in the project highlighted positive and negative elements of the VegTool program and its capacity to assist growers with financial aspects of their crop production. The positive feedback identified features of the program including: simplicity, versatility, different options for calculating costs, various options for selecting units and products (eg harvest units, fertiliser and chemical products) and the program functions working correctly.

Conversely the negative feedback received pointed to some limitations of the program, such as; the program is too simple, it is not clear how to download or install the program, a lot of information needs to be known prior to using it, there needs to be more selection options for some cost calculators, time limitations may prevent some growers from using the program and additional forms of assistance need to be provided for growers to realize the benefits of the program.

Some experienced growers found the program less useful because they already knew their costs and gross margins. Several growers had created their own budgeting tools because they could not find anything suitable on the commercial market. One grower even developed a detailed program to record, monitor and analyze his farm business costs. Others found that entering the data is time consuming and suggested this would interfere with other farm priorities. Others considered that additional support such as workshops are needed to help growers be familiar with the program. Difficulties with installing the program were also reported which may be linked to either growers' general computer skills or not following supplied instructions.

This feedback enabled an upgrade of the program's content and report layout. Several improvements were implemented including the addition of a printable workbook to enable users to collect data prior to sitting down at the computer. Audio visual tutorials were added to allow users an easy way to learn how to use the program and therefore increase the effectiveness of its use.

At the end of the project the positive features of VegTool were again reinforced. Feedback highlighted that VegTool was excellent to review crop financial performance, test crop gross margins against expected market prices, plan future cropping programs and explore the costs and returns of changed management practices.

Awareness of VegTool, was generated through various forms of media, field and technology transfer activities including field days, workshops, webinars, radio interviews, newspaper articles, vegetable newsletters and information about VegTool on various websites.

During the project many growers reported that their searches for relevant financial information on vegetable production were only moderately successful. Some growers explained that they were aware that other economic analysis tools and programs were available, but they considered that they were too complex and hard to understand or were for horticulture in general and not vegetable specific.

Almost all recipients of the program indicated, that they had sought a copy of VegTool because they had heard or read about it. They thought it would be good because it was customized for the vegetable industry and would help them to operate and understand their business because it was industry specific.

The need to make not only technical but financial improvements in the business operations also initiated many growers interest in obtaining a copy of VegTool. Upon learning about VegTool they thought it could bring all the required information together and be more applicable to their specific

needs, such as analyzing whole farm profitability, profit and loss and help them make management decisions.

At field days, some people seemed reluctant to find out what the VegTool CD contained. To assist awareness and deliver clear messaging and informative advertising, a range of support materials were developed. This included a brochure to provide an overview of VegTool, handouts to highlight the program's functions and benefits, banners and posters to describe what VegTool does in an industry specific way and a video which gives an overview of VegTool. The latter is published at the NSW DPI website and is viewed as a YouTube file. These materials helped to not only engage enthusiastic participants, but also explain, in an unobtrusive way, to hesitant participants, what VegTool does.

Peer review of the extension methodology of the VegBiz project was highly commended at the APEN National Forum held in 2011. The project presentation highlighted the effectiveness of both the technologies and the participatory extension methods being used to raise the awareness of VegTool and improve the financial understanding of growers in the Australian vegetable industry.

Overall raising the awareness of VegTool was considered to be successful as there were regular telephone and email inquiries requesting a copy of the program.

Throughout the project over 400 VegTool CD's were distributed to growers and industry professionals in all states of Australia via technology transfer activities and mail outs. The program was available by download from the AusVeg website, however the number of downloads was not able to be determined. Vegetable Industry Development Officers were an important conduit for delivering VegTool CD's and information as they were keen to help growers with new technologies. The CD format of VegTool also enabled it to be re-used or shared and then installed on additional computers and laptops, however these numbers are unknown.

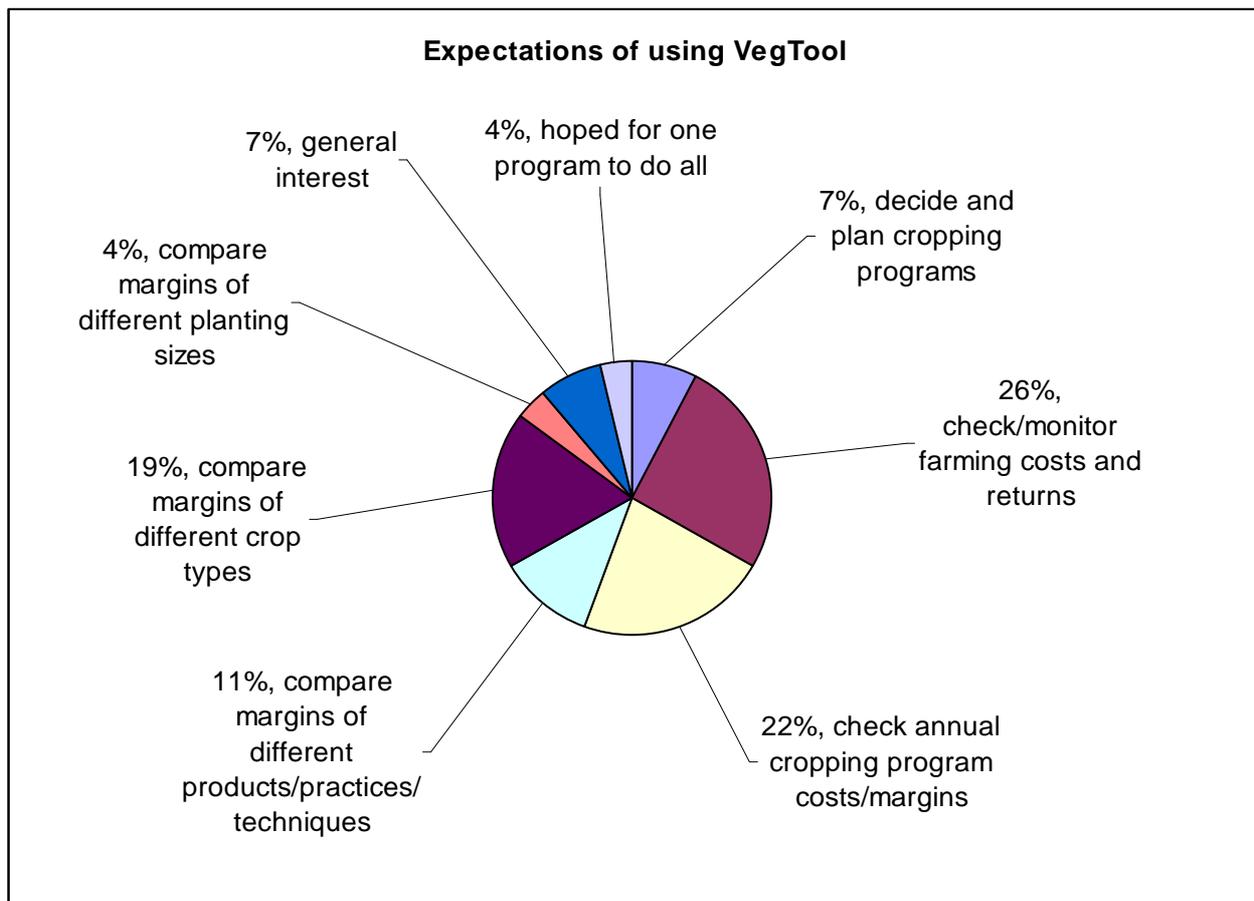
Whilst distributing VegTool to growers it became obvious that the preferred method of receiving the program was via the CD. Downloading the program from the Ausveg website was not preferred by many growers. There were suspicions that being connected to the internet posed risks about confidentiality of personal and financial information they would enter into VegTool. Some thought that some details could be potentially be tracked or become known to other parties such as other growers, supermarkets or the tax department. It was also thought that this information can affect market prices and returns and their business viability. These concerns resulted in the project reinforcing this point "VegTool is not a web-based program so the information entered is confidential and remains in the control of the user".

Distributing the CD at grower workshops seemed to provide a greater uptake than at field days. Every grower at each of the workshops held were eager to collect their copy of VegTool whilst most people at the field days were reluctant to approach and ask questions or talk about the program.

This difference in willingness to take a copy of the CD may have been due to the fact that growers attending workshops were a targeted audience. They were already interested in increasing their knowledge about the industry and so more open to the idea of accepting a copy of the program to take home. Whereas those people who visited VegTool displays at the field days were a wider cross section of the farming community and may have been just looking or browsing and less motivated to accept a copy of a computer program not designed specifically for their industry.

The analysis of how well VegTool assisted vegetable businesses in improving their financial knowledge of production costs and business decisions is represented in the following figures and responses. The expectations of people requesting and using VegTool varied as seen in Figure 1.

Figure 1. Expectations of using VegTool.



The benefits users gained from using VegTool varied considerably. Various responses commented on the simplicity of the program, for example;

- *“simple to use”*
- *“reasonably user friendly and would be a handy tool”*
- *“easy to use and clear to understand”.*

The versatility of VegTool was also highlighted and summed up by;

- *“can accommodate smaller planting areas and shade houses”*
- *“this tool can be adapted/modified to all crop industries”* and
- *“it is best suited to new growers or those just entering the industry”.*

Some users commented on the financial aspects and calculator functions of VegTool;

- *“challenges people to find 'real' information about their business”*

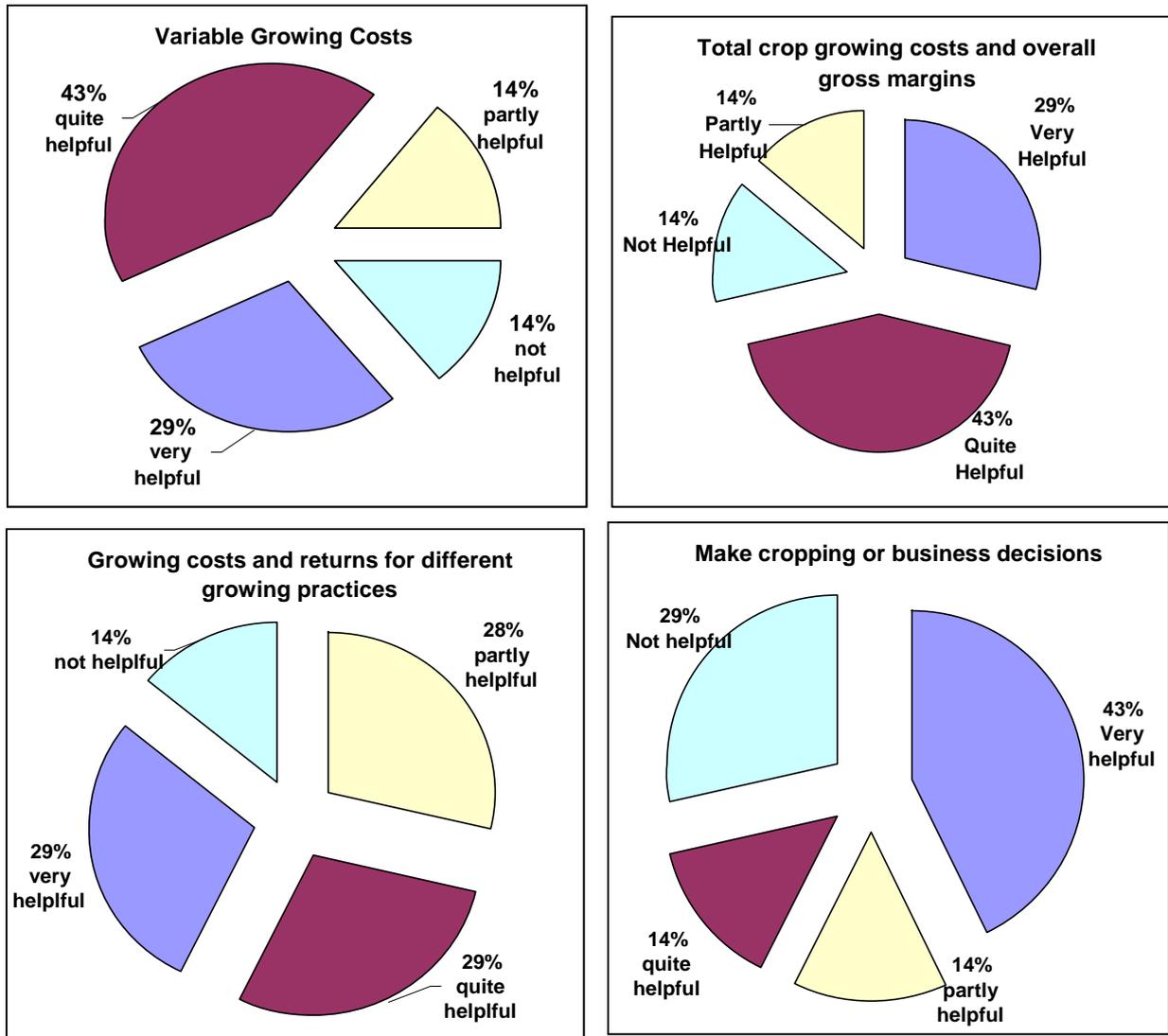
However, other responses indicated the program was too simple for their needs;

- *“I think the tool is too simplistic to be of much use to anyone who knows what they are doing, but it may be useful for instructing novices.*
- *“I don't see much value for someone like us with only isolated point in time GM's when our prices change over the season so much. “*
- *“I can't see that farmers who are not computer literate would use the tool when they could probably do it more easily on a piece of paper.”*
- *“Not useful for the way we calculate our gross margins. We have multiple plantings of the same crop in a season and some of the costs/income change depending on the time of year.*

We do our gross margins month by month over the whole season and we can then generate a cash flow.”

Several questions sought responses to how VegTool improved respondents’ knowledge and assisted their decision making in relation to growing costs and growing practices. The responses are presented in the four graphs in Figure 2.

Figure 2. Usefulness to increasing knowledge of growing costs and decision making.

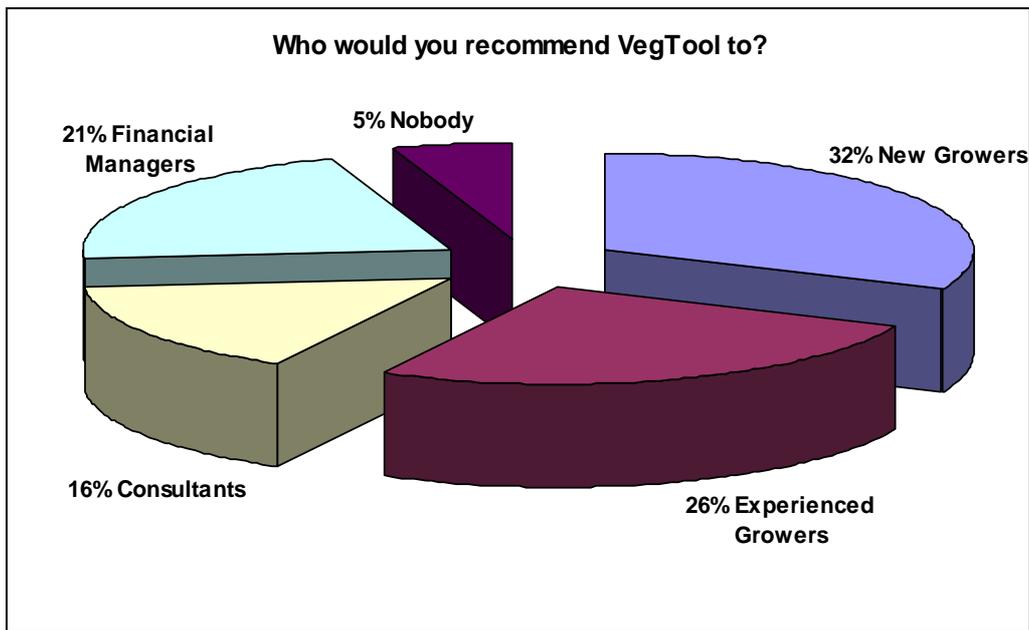


Conversely there was some feedback that supplementary information is needed to help with using VegTool. Some comments referred to difficulties using the program when not all the information required was known, e.g;

- *“difficulty is not knowing the facts that they need to know”*
- *“growers must have access to current costs, perhaps an internet site with it all on it”*
- *“even after considerable online research, not enough information”*

In reviewing the effectiveness of distributing VegTool and whether users would recommend it, the responses to this question were interesting and included new growers, experienced growers, consultants, financial managers and nobody. A summary is included in Figure 3.

Figure 3. Who can benefit from using VegTool?

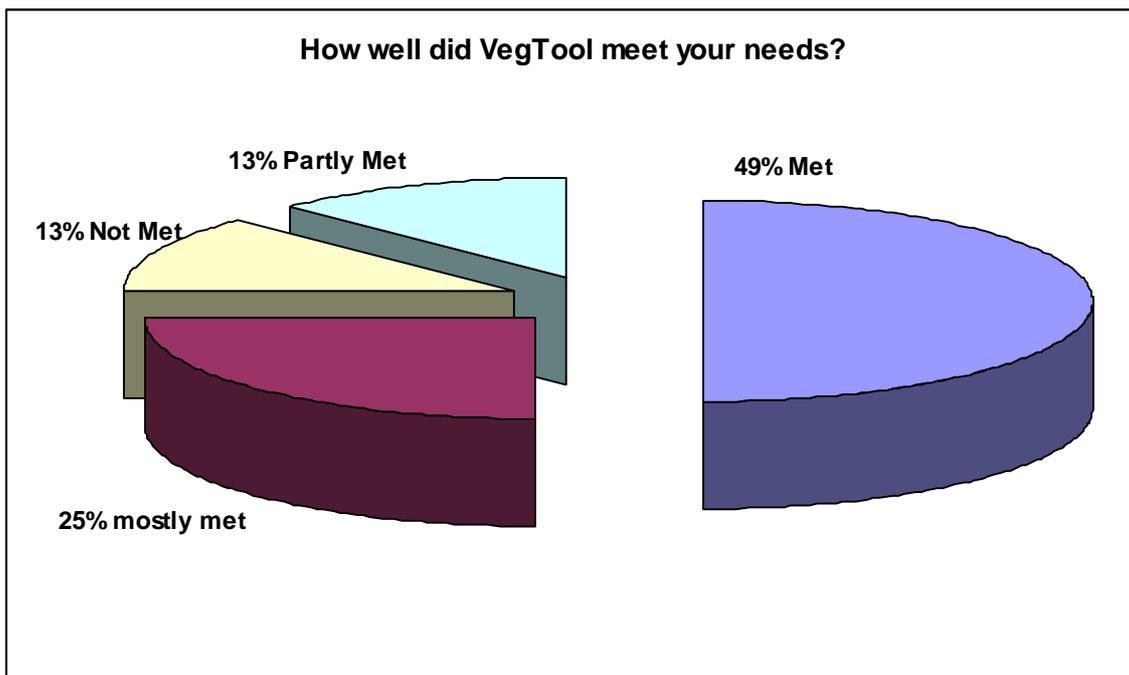


One respondent commented

- *“the middle men “service providers” are a good avenue to get the program out there, the growers looking for help, are already going to them. They have already made the decision to improve their management skills etc,”*

How well VegTool met your needs was a question aimed at gaining an overall reaction to using VegTool and also used a 5 point scale to rate responses. A meet or mostly meet expectations was recorded by almost 74% whilst the remaining 26% rated this as only partly met or not met. The results are summarized in Figure 4.

Figure 4. How well did VegTool meet your needs?



Discussion

The VegBiz project successfully raised awareness of VegTool and distributed the tool to the Australian vegetable industry. Those who had used the program and entered data to create scenarios found it extremely useful and had made some decisions about crop production. The majority of those who used VegTool seemed to be progressive and looking to improve the vegetable business they were working with. They were enthusiastic about VegTool and its functions to calculate costs, gross margins and compare different scenarios.

However initial expectations of farmers embracing the technology as an agent for business improvement was less than expected. The utilization of VegTool by those who obtained the CD was moderate. Only about half of those growers who received a copy reported using it in their business. Those who hadn't used it replied that it was "still sitting on their desk" or they "had misplaced it" or "used it only once".

Growers reported that their VegTool reports provided opportunities to both review and plan crop production. Most users started with a recently completed crop which they used this as a base scenario. Then they entered different information into the VegTool variables such as market price, yield and growing costs and were able to compare this with the original scenario. The comparison allowed them to measure the gross margin result of the different scenarios. This information was used to consider new crops to plant, the influences of market conditions of supply and price on their profitability and options for crop management practices such as fertilizer and chemical spray programs.

Younger growers had no trouble installing the program and didn't need the audio visual tutorials as the program was simple to understand. Many of the younger growers were using VegTool to compare income differences with high and low yields or selling prices. One young grower reported that he thought it was "easier than using pen and paper."

Conversely many of the older growers thought that using a pen and paper was easier. They reported not having enough time to look at the program or commented that their wives were the ones who did all the computer work.

Some experienced growers found the program not so useful because they felt they didn't need it because they already knew their costs of production and profit margins. Others found that entering the data was too time consuming and this interfered with their operational activities on the farm. Some growers just entering or new to the vegetable industry found that a lot of information needed to be known beforehand and expected VegTool to provide this.

A majority of the industry professionals who received a copy had utilized it in their business. One industry professional had used it extensively with growers to compare the costs and financial result of using various fertilizer and chemical programs for the vegetable crop being grown.

Recommendations

VegTool can continue to be a valuable decision making tool for the vegetable industry into the future. NSW DPI, AusVeg and other agencies currently providing on-line links can continue to support to VegTool through their website services which help maintain awareness and availability of the program. NSW DPI vegetable development services can promote VegTool to industry and engage potential users where appropriate. Similarly there are many current users of the program, particularly industry professionals, who can encourage use of VegTool through their services that they provide farmers and by word of mouth.

Some functions of VegTool can be improved by upgrading the design. This is relevant particularly to the Electricity/Gas Cost Calculator, whilst all the cost calculators could do with minor inclusions and

refinements. Another significant technological development would be creating, on-line or downloadable calculators or 'stand-alone' apps for some or each of the cost calculators.

The development of benchmarking capacity related to VegTool would be quantum development. Methods for maintaining confidentiality would be paramount. In addition, methods to gather, analyze and report the information would need to be arranged. This approach could allow growers and industry to cross reference best practice information.

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Appendices

Appendix 1. List of resources and publications referenced for VegTool development & VegBiz workshops

Appendix 2. VegTool resources and VegBiz activities

Appendix 1. List of resources and publications referenced for VegTool development & VegBiz workshops

Thompson, Lauren, Scholefield Robinson Horticultural Services Pty Ltd (2009) Final Report VG08004 - Grower friendly tool for comparing management and profitability of vegetable crops, September 2009

Resing, JoAnn RIRDC (2007) *Farm Management Software for Farm Businesses – Case-studies of the Australian farm software industry*. November 2007 Publication No. 07/163, ISBN 1 74151 558 0, ISSN 1440-6845

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AusVeg, *Gross Margin Tool, VegTool 1.0 – Grower friendly tool for comparing management and profitability of vegetable crops*, <http://ausveg.com.au/intranet/technical-insights/tools/grossmargin.htm>

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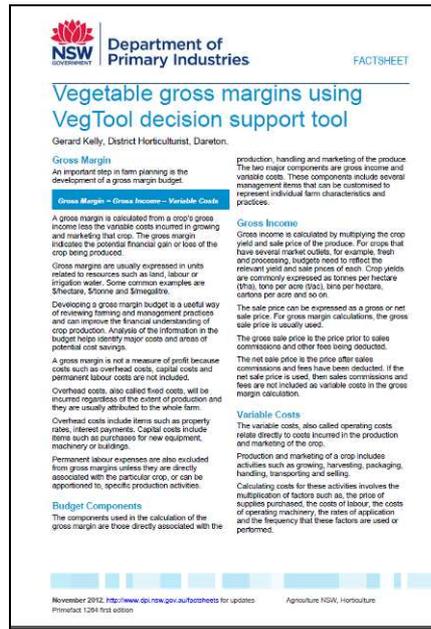
NSW Department of Primary Industries – *Guide to machinery and water costs for farm budgets including costs for tractors and associated implements*
Available at; <http://www.dpi.nsw.gov.au/agriculture/farm-business/budgets/machinery-water>

Electricity Cost Calculator. Available at: <http://www.handymath.com/cgi-bin/electric.cgi?submit=Entry>

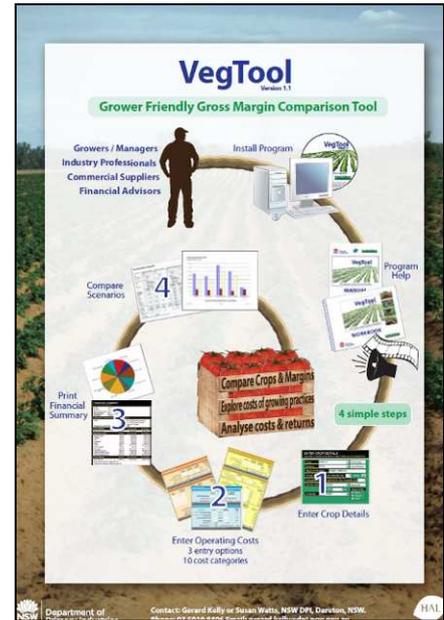
Appendix 2. VegTool resources and VegBiz activities



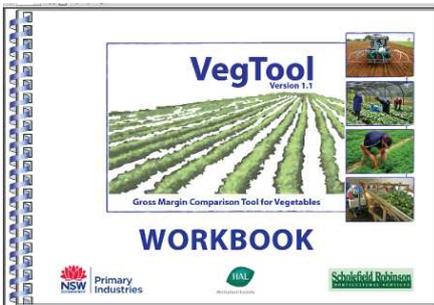
VegTool program packaged CD & Wallet



VegTool Factsheet



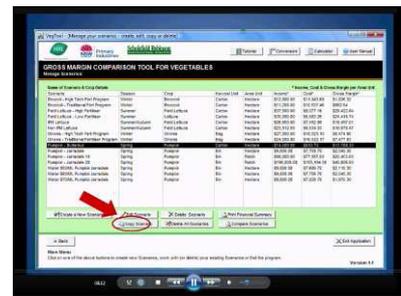
VegTool banner



VegTool printable workbook



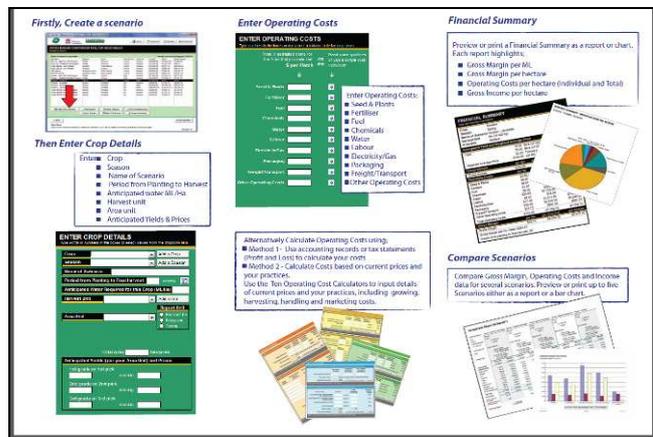
VegTool YouTube video presentation



VegTool 'Manage Scenarios' audio visual tutorial



VegTool brochure outside



VegTool brochure inside

GROSS MARGIN BUDGET		2013	
Area Unit = 1 Ha	LETUCE	Yield	Price
Anticipated Yield	2200 cabbages	24,200.00	\$ 11.60
Weighted Average Price			\$ 11.60
GROSS INCOME		\$ 276,720.00	
OPERATING COSTS:			
Seed and Plants	7000 cabbages @ \$ 0.40	\$ 2,800.00	
Fertiliser	400 kg @ \$ 1.00	\$ 400.00	
Fuel	100 litres @ \$ 1.50	\$ 1,500.00	
Chemicals	100 litres @ \$ 1.50	\$ 1,500.00	
Water	1000 litres @ \$ 0.05	\$ 50.00	
Labour	100 hours @ \$ 10.00	\$ 1,000.00	
Electricity/Gas	100 kWh @ \$ 0.20	\$ 20.00	
Packaging	100 kg @ \$ 1.00	\$ 100.00	
Freight/Transport	100 kg @ \$ 1.00	\$ 100.00	
Other Costs			
Gross Margin per Ha (A-B)		\$ 268,920.00	

Gross margin budget - lettuce

GROSS MARGIN BUDGET		2013	
Area Unit = 1 Ha	CAPSICUM	Yield	Price
Anticipated Yield	2000 capsicums	20,000.00	\$ 10.00
Weighted Average Price			\$ 10.00
GROSS INCOME		\$ 200,000.00	
OPERATING COSTS:			
Seed and Plants	2000 capsicums @ \$ 0.50	\$ 1,000.00	
Fertiliser	400 kg @ \$ 1.00	\$ 400.00	
Fuel	100 litres @ \$ 1.50	\$ 1,500.00	
Chemicals	100 litres @ \$ 1.50	\$ 1,500.00	
Water	1000 litres @ \$ 0.05	\$ 50.00	
Labour	100 hours @ \$ 10.00	\$ 1,000.00	
Electricity/Gas	100 kWh @ \$ 0.20	\$ 20.00	
Packaging	100 kg @ \$ 1.00	\$ 100.00	
Freight/Transport	100 kg @ \$ 1.00	\$ 100.00	
Other Costs			
Gross Margin per Ha (A-B)		\$ 185,430.00	

Gross margin budget - capsicum

GROSS MARGIN BUDGET		2013	
Area Unit = 1 Ha	ZUCCHINI	Yield	Price
Anticipated Yield	1000 zucchinis	10,000.00	\$ 20.00
Weighted Average Price			\$ 20.00
GROSS INCOME		\$ 200,000.00	
OPERATING COSTS:			
Seed and Plants	1000 zucchinis @ \$ 1.00	\$ 1,000.00	
Fertiliser	400 kg @ \$ 1.00	\$ 400.00	
Fuel	100 litres @ \$ 1.50	\$ 1,500.00	
Chemicals	100 litres @ \$ 1.50	\$ 1,500.00	
Water	1000 litres @ \$ 0.05	\$ 50.00	
Labour	100 hours @ \$ 10.00	\$ 1,000.00	
Electricity/Gas	100 kWh @ \$ 0.20	\$ 20.00	
Packaging	100 kg @ \$ 1.00	\$ 100.00	
Freight/Transport	100 kg @ \$ 1.00	\$ 100.00	
Other Costs			
Gross Margin per Ha (A-B)		\$ 185,430.00	

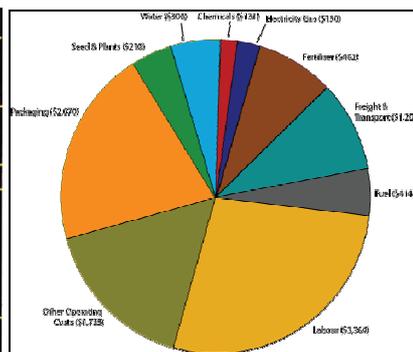
Gross margin budget - zucchini

AusVeg website featuring VegTool

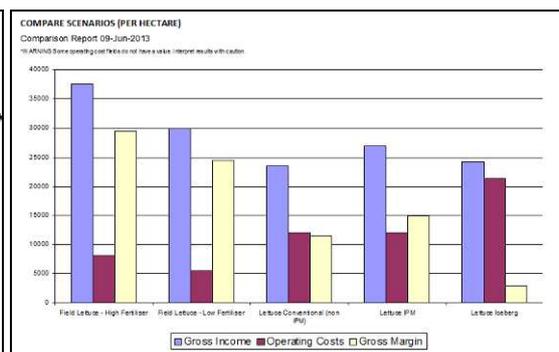
Vegetables Victoria website featuring VegTool

FINANCIAL SUMMARY			
Scenario Standard Description			
Crop	Pumpkin		
Season	Spring		
Name of Scenario	Pumpkin - Jarradale		
Harvest Unit	Bin (of 420 kg)		
Area Unit	Hectare		
Anticipated Yield and Weighted Average Price			
Yield	70.00 Bins (of 420 kg) per Area Unit		
Weighted Average Price	29.48 Tonnes per Hectare		
	\$140.00 per Bin		
Gross Income			
	per Bin	per Area Unit	per Hectare
Gross Income	\$140.00	\$9,800.00	\$9,800.00
Operating Costs			
	per Bin	per Area Unit	per Hectare
Seed & Plants	\$3.60	\$252.00	\$252.00
Fertiliser	\$6.60	\$462.00	\$462.00
Fuel	\$6.91	\$483.75	\$483.75
Chemicals	\$1.87	\$130.70	\$130.70
Water	\$0.09	\$62.00	\$62.00
Labour	\$24.63	\$1,724.00	\$1,724.00
Electricity/Gas	\$0.21	\$15.00	\$15.00
Packaging	\$17.30	\$1,211.00	\$1,211.00
Freight/Transport	\$12.00	\$840.00	\$840.00
Other Operating Costs	\$12.73	\$891.25	\$891.25
Total Operating Costs	\$110.85	\$7,769.70	\$7,769.70
Gross Margin			
	per Bin	per Area Unit	per Hectare
Gross Margin	\$29.15	\$2,040.30	\$2,040.30
Gross Margin per Bin Water \$291.47			
Weeks from planting to final harvest: 20			

Financial summary report table



Financial summary report pie chart graphic



Compare Scenarios' report bar chart graphic



VegTool displays at vegetable field days including National Vegetable Expo, Werribee, 2013



Grower workshop



Conference presentation



Grower workshop