

Vegetable gross margins using VegTool decision support tool

Gerard Kelly, District Horticulturist, Dareton.

Gross Margin

An important step in farm planning is the development of a gross margin budget.

$$\text{Gross Margin} = \text{Gross Income} - \text{Variable Costs}$$

A gross margin is calculated from a crop's gross income less the variable costs incurred in growing and marketing that crop. The gross margin indicates the potential financial gain or loss of the crop being produced.

Gross margins are usually expressed in units related to resources such as land, labour or irrigation water. Some common examples are \$/hectare, \$/tonne and \$/megalitre.

Developing a gross margin budget is a useful way of reviewing farming and management practices and can improve the financial understanding of crop production. Analysis of the information in the budget helps identify major costs and areas of potential cost savings.

A gross margin is not a measure of profit because costs such as overhead costs, capital costs and permanent labour costs are not included.

Overhead costs, also called fixed costs, will be incurred regardless of the extent of production and they are usually attributed to the whole farm.

Overhead costs include items such as property rates, interest payments. Capital costs include items such as purchases for new equipment, machinery or buildings.

Permanent labour expenses are also excluded from gross margins unless they are directly associated with the particular crop, or can be apportioned to, specific production activities.

Budget Components

The components used in the calculation of the gross margin are those directly associated with the

production, handling and marketing of the produce. The two major components are gross income and variable costs. These components include several management items that can be customised to represent individual farm characteristics and practices.

Gross Income

Gross income is calculated by multiplying the crop yield and sale price of the produce. For crops that have several market outlets, for example, fresh and processing, budgets need to reflect the relevant yield and sale prices of each. Crop yields are commonly expressed as tonnes per hectare (t/ha), tons per acre (t/ac), bins per hectare, cartons per acre and so on.

The sale price can be expressed as a gross or net sale price. For gross margin calculations, the gross sale price is usually used.

The gross sale price is the price prior to sales commissions and other fees being deducted.

The net sale price is the price after sales commissions and fees have been deducted. If the net sale price is used, then sales commissions and fees are not included as variable costs in the gross margin calculation.

Variable Costs

The variable costs, also called operating costs relate directly to costs incurred in the production and marketing of the crop.

Production and marketing of a crop includes activities such as growing, harvesting, packaging, handling, transporting and selling.

Calculating costs for these activities involves the multiplication of factors such as, the price of supplies purchased, the costs of labour, the costs of operating machinery, the rates of application and the frequency that these factors are used or performed.

Resources, Practices & Risk

The information and figures included in a gross margin determine its usefulness.

Each farm is unique because its location, climatic conditions, physical resources, infrastructure and the types of farming equipment used are different. Growing practices, the prices of supplies and the rates of application will also vary for each farm.

Thus a gross margin should be prepared to match the particular farm and crop being reviewed. Thus, it is important to obtain and include information that is relevant to the region and crop for which the particular budget is being prepared.

Different levels of risk are associated with crops and the management practices used. Results of gross margin calculations which indicate a high margin or high returns on paper often involve considerably more financial risk. With vegetable growing, the level of risk is often directly related to the intensiveness of the crop's production practices. The more intensive crops have higher variable production costs which may or may not be compensated by the final sale price.

Various crops also respond to competition and market supply and demand forces in different ways. These factors need to be considered when developing a gross margin and making decisions about crop management practices.

The results of any gross margin calculation should be viewed cautiously and used as a guide only. Obtaining additional technical or financial advice is suggested and can be helpful with the interpretation of figures.

Practical Uses

Once a gross margin is developed, new budgets can be easily prepared by modifying the figures in the existing budget. This allows different management practices and farm operations to be examined and the potential gross margins to be considered.

For example it could be useful to explore different seeding, irrigation, fertiliser or chemical products and rates, different labour or packaging arrangements or transport options.

Once figures within the chosen crop or management activity are modified, the changes in costs and the effect on the final gross margin can be reviewed and assessed.

Sensitivity Analysis

A sensitivity analysis is a method to analyse the crop's profitability in relation to changing production or market conditions. For a gross margin, the two components that are usually considered for sensitivity analyses are crop yield and sales price. In the sensitivity analysis the effect of higher or lower yields and greater or lesser sales prices can be represented. These changes allow the effect on the final margin to be assessed.

The sensitivity analysis can be presented as a matrix table with the varied components, yield and price, on separate axes.

VegTool



VegTool is a computer program that calculates gross margins and was developed specifically for the vegetable industry. It is grower friendly, uses common industry terms and provides a quick and easy way to assess the potential financial gain or loss of a particular crop or set of growing practices.

Growers can 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 figures and information entered into VegTool are used to calculate gross income, operating costs and gross margins and to produce financial reports. These summaries can be previewed, printed and saved to be later modified if required.



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Uses for Industry

VegTool can be used by a range of people in the industry. New vegetable growers can prepare a full budget and investigate the potential income and growing costs from seed to market. Experienced vegetable growers may choose to focus on certain aspects of management, such as fertilisers, spray programs or harvesting practices to improve efficiencies. Commercial service providers can use VegTool to demonstrate the costs and benefits of new products or assess a farm's financial position.

VegTool is versatile in how it can be used. The program can develop and compare whole crop budgets. It is also useful for analysing and comparing partial crop budgets such as different management or growing practices.

For example, it is possible to compare the costs of different labour sources, such as contract and/or casual labour, compare different seeding rates, compare different planting practices and review the costs of purchasing temporary water.

Getting Started

When starting out, VegTool is loaded onto a computer from a CD. It is not a web-based program so the information entered is confidential and remains in the control of the user. Information and figures that are entered can be customised to match growers' individual farming situations.

There are four simple steps to using VegTool:

1. Enter Crop Details
2. Enter Growing Costs
3. Print Financial Summary
4. Compare Crop Scenarios

There are also support options including a manual, workbook and help tutorials to guide users throughout the program.

Enter Crop Details

In 'Enter Crop Details', information about the crop is entered to establish the background for the gross margin. Each crop situation developed is given a unique 'scenario name'.

The type of information that is entered includes; crop (or variety), season, period from planting to harvest, anticipated crop water requirements, harvest unit, report unit and production area.

Figures about anticipated yields and market prices are entered next. This allows the gross income for the scenario to be calculated. There are options to enter up to three different harvest grades or picks and the relevant prices.

Using 'Enter Crop Details', new scenarios can be prepared to explore management and cost options

for different crops, varieties, growing seasons, anticipated yields, expected prices and so on.

Each new 'scenario' developed is saved with a new scenario name.

ENTER CROP DETAILS
Type words or numbers in the boxes or select values from the dropdown lists

Crop: Pumpkin [Add a Crop]
Season: Spring [Add a Season]
Name of Scenario: Pumpkin - Butternut
Period from Planting to Final Harvest: 18 weeks
Anticipated Water Required for this Crop (ML/Ha): 6
Harvest Unit: Cartons [Add a Unit]
Carton weight: 14 kg
Area Unit: Hectare
Report Unit: Carton, Kilogram, Tonne
Total Area: 1 hectares

Anticipated Yields (per your Area Unit) and Prices

Grade	Yield (Cartons)	Earning (per Carton)
1st grade or 1st pick	1200	\$12.00
2nd grade or 2nd pick		
3rd grade or 3rd pick		

Enter Operating Costs

'Enter Operating Costs' is where figures are entered to calculate growing costs. There are ten cost categories:

- Seed and Plants
- Fertiliser
- Fuel
- Chemicals
- Water
- Labour
- Electricity/Gas
- Packaging
- Freight/Transport
- Other Operating Costs

There are three different options for entering operating costs which provide choice and flexibility to input management practice details.

The first option is used when operating costs are already known from experience or past seasons. Figures are entered directly into the boxes next to each cost category. The second and third options use a cost calculator which is accessed by clicking the blue arrow button next to each operating cost category.

Operating Cost Calculators

The second option estimates costs from tax invoices and accounting records. Total costs from these sources are collated and then the percentage relating to the scenario is entered. Thus the cost is an estimated figure. If records are readily available, this option can be a quick method of determining costs.

The third option calculates costs based on current practices and prices. There are extensive options for entering detailed information about growing practices, product prices, rates of application, labour rates, equipment operations, etc. Thus, the calculated costs reflect actual farm practices and are more accurate.

Seed and Plants

The Seed and Plants Cost Calculator allows details of the following to be entered:

- seed, seedling and plants costs
- sowing or planting rates and densities
- on-site nursery costs

Fertiliser

The Fertiliser Cost Calculator allows the user to include crop specific information including:

- fertiliser and soil conditioner products
- prices of products
- rates and number of applications
- soil and plant analysis costs
- contract fertiliser application services & costs

Fuel

The Fuel Cost Calculator helps estimate or calculate the following:

- fuel and lubricant costs
- irrigation pumping costs
- hours of machinery/fuel use for cultivation, sowing, spraying, fertiliser application and harvesting

Chemical

The Chemical Cost Calculator is used to enter pest management information including:

- details of chemical products
- price of products
- rates of application
- number of applications
- contract chemical application services & costs
- contracted pest scout and bio-control agents

Water

The Water Cost Calculator allows details of the following information to be entered:

- amount of irrigation water required for crop
- cost of allocated surface water
- cost of purchased (temporary) water
- cost of reclaimed water

Labour

The Labour Cost Calculator assists with the calculation of the following:

- cost of permanent labour (that is directly associated with the crop)
- cost of casual labour per hour for activities such as tractor driving, weeding, irrigating, harvesting, grading and sorting, packing, shed work etc.
- cost of piece rate activities including harvesting, packing, cleaning, grading/sorting, planting, thinning and weeding

Labour Cost Calculator				
Method 1: Use accounting records or tax statements (Profit & Loss) to estimate your labour costs.				
	Total Cost In Accounts	% Total Costs allocated to this Scenario	No. of hectares sharing this allocated cost	Calculated Cost per hectare
Owner Managers' Costs (on-farm)	<input type="text"/>	<input type="text"/>	<input type="text"/> hectares	\$0.00
Permanent, Casual and Contract Labour Costs	<input type="text"/>	<input type="text"/>	<input type="text"/> hectares	\$0.00
Total cost per Hectare <input type="text"/> \$0.00 per hectare, based on average of historical costs				
Total cost per Area Unit <input type="text"/> \$0.00				<input type="button" value="Use this value in your scenario"/> <input type="button" value="Cancel"/>
NOTE: Your Area Unit for this Scenario is 1,000 Hectares.				
Method 2: Calculate labour costs based on time and rates of pay in your chosen unit of area.				
Permanent Labour		Total hours per Area Unit	\$ per hour	Calculated Cost per Area Unit
Owner Managers' Costs (on-farm)	<input type="text"/> hours	x	<input type="text"/> per hour	= \$0.00
Employee Costs (on-farm)	<input type="text"/> hours	x	<input type="text"/> per hour	= \$0.00
Casual Labour and Contract Labour				
Activity	Total hours per Area Unit		\$ per hour	Calculated Cost per Area Unit
Tractor Driving - all operations	<input type="text"/> hours	x	<input type="text"/> per hour	= \$0.00
Field (planting thinning, weeding)	<input type="text"/> hours	x	<input type="text"/> per hour	= \$0.00
Irrigation	<input type="text"/> hours	x	<input type="text"/> per hour	= \$0.00
Harvest	<input type="text"/> hours	x	<input type="text"/> per hour	= \$0.00
Grading / Sorting	<input type="text"/> hours	x	<input type="text"/> per hour	= \$0.00
Packing (on-farm)	<input type="text"/> hours	x	<input type="text"/> per hour	= \$0.00
Shed (forklift / coolroom)	<input type="text"/> hours	x	<input type="text"/> per hour	= \$0.00
Other	<input type="text"/> hours	x	<input type="text"/> per hour	= \$0.00
Piece Rate Activities				
Activity Description	Basis of Payment (e.g. \$ per row or \$ per bucket)		Number of "Payment Units" in your chosen Area Unit	Calculated Cost per Area Unit
Choose an activity from the list or type in your own	\$	Payment Unit		
<input type="text"/>	<input type="text"/>	<input type="text"/>	x	= \$0.00
<input type="text"/>	<input type="text"/>	<input type="text"/>	x	= \$0.00
<input type="text"/>	<input type="text"/>	<input type="text"/>	x	= \$0.00
<input type="text"/>	<input type="text"/>	<input type="text"/>	x	= \$0.00
<input type="text"/>	<input type="text"/>	<input type="text"/>	x	= \$0.00
<input type="text"/>	<input type="text"/>	<input type="text"/>	x	= \$0.00
<input type="text"/>	<input type="text"/>	<input type="text"/>	x	= \$0.00
Total cost per hectare <input type="text"/> \$0.00				
Total cost per Area Unit <input type="text"/> \$0.00				<input type="button" value="Use this value in your scenario"/> <input type="button" value="Cancel"/>
NOTE: The Yield per your Area Unit is 1,200.00 Cartons (of 14 kg) = 16.80 Tonnes.				

Electricity/Gas

The Electricity/Gas Cost Calculator is used for the estimation or calculation of:

- costs for operating irrigation pumps
- costs for lighting
- costs for cool rooms and sheds

Packaging

The Packaging Cost Calculator uses the following information to estimate or calculate costs:

- details of package materials
- cost of packaging accessories
- quantities of package materials
- details of off farm contract packing & costs

Freight/Transport

The Freight/Transport Cost Calculator estimates or calculates from the following:

- details of freight charges
- modes of transport
- details of market destinations
- number of pallet spaces utilised
- cost of freight insurance

Other Operating Costs

The Other Operating Cost Calculator allows input of any costs that may not have already been included such as:

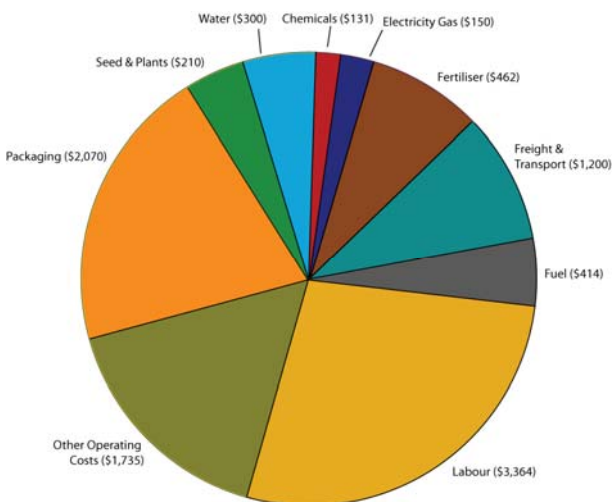
- agronomy consultants
- professional services and audit fees
- other contracted services
- levies and commissions
- licences and inspection services
- equipment & machinery maintenance
- crop insurance
- lease and rental payments

Print Financial Summary

When all costs are entered or calculated, the next step in VegTool is to preview and/or print the financial reports. The Financial Summary is the key report and is displayed as both a table of detailed figures and as a pie chart graphic.

FINANCIAL SUMMARY			
Crop and Scenario Description			
Crop	Pumpkin		
Season	Spring		
Name of Scenario	Pumpkin - Butternut		
Harvest Unit	Carton (of 14 kg)		
Area Unit	Hectare		
Anticipated Yield and Weighted Average Price			
Yield	1,200.00	Cartons (of 14 kg) per Area Unit	
	1,200.00	Cartons (of 14 kg) per Hectare	
	16.80	Tonnes per Hectare	
Weighted Average Price	\$12.00	per Carton (of 14 kg)	
Gross Income			
	per Carton	per Area Unit	per Hectare
Gross Income	\$12.00	\$14,400.00	\$14,400.00
Operating Costs			
	per Carton	per Area Unit	per Hectare
Seed & Plants	\$0.18	\$210.00	\$210.00
Fertiliser	\$0.39	\$462.00	\$462.00
Fuel	\$0.34	\$413.75	\$413.75
Chemicals	\$0.11	\$130.70	\$130.70
Water	\$0.30	\$360.00	\$360.00
Labour	\$2.82	\$3,384.00	\$3,384.00
Electricity/Gas, etc	\$0.13	\$150.00	\$150.00
Packaging	\$1.73	\$2,076.00	\$2,076.00
Freight/Transport	\$1.07	\$1,280.00	\$1,280.00
Other Operating costs	\$0.91	\$1,091.25	\$1,091.25
Total Operating Costs	\$7.96	\$9,557.70	\$9,557.70
Gross Margin			
	per Carton	per Area Unit	per Hectare
Gross Margin	\$4.04	\$4,842.30	\$4,842.30
Gross Margin per ML Water \$807.05			
Weeks from planting to final harvest: 18			

The pie chart displays colour coded operating costs per hectare which have visual impact and are easy to interpret.



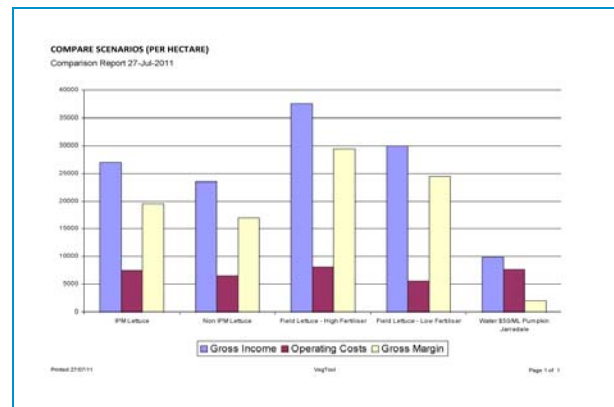
Compare Scenarios

The Compare Scenarios function allows up to five individual financial summaries to be selected and compared, side by side. This is a convenient and useful way to look at several prepared scenarios and contrast the crop and management cost information displayed.

The comparison report is displayed as a table of detailed figures and as a bar chart graph.

The screenshot shows a software window titled 'Comparison Report 20-Jul-2011'. It contains a complex table with multiple columns representing different scenarios (e.g., Field Lettuce - High Fertiliser, Field Lettuce - Low Fertiliser, Water \$55/ML, Pumpkin - Jaradale, Water \$70/ML, Pumpkin - Jaradale). The rows include various financial metrics such as Yield, Average Price, Gross Income, Operating Costs, and Gross Margin, broken down by unit (per Carton, per Area Unit, per Hectare).

The table displays figures for gross income, operating cost and gross margin, per hectare and per area unit. The gross margin per megalitre is also displayed in this format.



The bar chart displays colour coded gross income, total operating costs and gross margin figures per hectare for easy interpretation.

The group of scenarios selected for comparison can be saved as a 'Comparison Report' and given a relevant name. A saved Comparison Report can be selected and reviewed as required.

Additional Features

In VegTool, a report can be developed quickly with a minimum of 10 inputs. More detailed reports can be developed as there are over 400 variables where information that represents individual farm practices, can be entered. There are over 120 crops to choose from, 17 harvest units (such as bin, bunch, carton, punnet), 14 area units (such as acre, greenhouse, pivot), 3 different harvest grades, options for up to 10 fertiliser and 15 chemical products, various labour activities, and various package materials, etc. Also there are drop down menus for many sections, meaning less typing.

A feature of VegTool is that data is displayed in several units including per acre, per hectare, per kilogram, per tonne, per megalitre, per box, per bin and many more.

VegTool also has a printable workbook which provides an option to enter information and figures on paper. With this approach, the information can be entered into the program when convenient.

Within the program there are four audio-visual tutorials which guide users at each screen.

There are options to save financial and comparison reports as PDF files which can then be emailed or faxed when required.

To obtain a VegTool program CD

BY MAIL

The VegTool program is available on CD from NSW Department of Primary Industries.

Contact Gerard Kelly at Dareton

Phone: 03 5019 8406 or 0411 139 657

Email: gerard.kelly@dpi.nsw.gov.au

BY DOWNLOAD

The VegTool program is available for download from the AUSVEG website.

ausveg.com.au/intranet/technical-insights/tools/grossmargin.htm

For quick download a broadband connection is recommended.

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