

Economics of NSW olive production

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Introduction

The information contained in this Primefact should be used with care, and as a guide only. The budgets outlined are examples of potential costs and returns. They are designed for online use, structured to allow users to enter in their own details for a personalised study of olive economics.

For organic and non-organic olive producers, budget economics may be influenced by two potential markets:

- **large producer** – for bulk oil and export oil
- **small producer** – for personal users and/or smaller domestic buyers.

Many smaller olive growers will want to sell smaller quantities at higher prices. A premium may be charged for certified organic product.

The information given here is an example of what can be involved in olive growing for sale to a wholesale market. It is advisable to get expert economic advice when using these budgets for decision making.

The budgets outlined below are the gross margin budget and the development cash flow budget.

Gross margins

[Four gross margin budgets](#) are available from the website www.dpi.nsw.gov.au that aim to provide an estimation of profitability. They can be amended to suit different situations.

Development cash flow budget

Also available is a framework for a non-organic [olive oil development cash flow budget](#) over 20

years. The development cash flow budget does not include all capital costs or allowance for overhead costs, because there will be wide variation in these costs depending on individual circumstances. For instance, an olive grove may be developed as a stand-alone enterprise, or as an activity on a large existing farm. The machinery or other capital expenditure that will be incurred, and the timing of such expenditure, will vary greatly depending on these circumstances.

The development cash flow budget can be completed by inserting the relevant proposed capital expenditure on a year-by-year basis. The analysis provides a list of required capital items that can be used as a starting point. Also, all the yearly operational costs and income assumptions are documented. If the cash flow analysis is completed, it will be possible to generate longer term indicators of profitability, such as net present value and internal rate of return ratios.

This study indicates that establishment costs can be approximately \$35,000 per hectare (capital items required plus first year cost of establishment) excluding land costs.

Harvesting

Harvesting can be complex, due to the considerable amount of innovation and development happening in the field. Some harvesting costs are quoted at cents per kilogram, others at dollars per tree or per hour. For example, for non-organic olive oil production in 2005, the costs for a contractor in this analysis are \$2.50 per tree. The range for larger groves varies from \$2–\$6 per tree, using contract over the row or larger trunk shaker configurations. Ten cents per kilogram has also been quoted for large operations. Smaller producers will possibly have to harvest with slower mechanical technologies, and the costs could be as much as \$12–\$19 per tree and 40c–60c per kilogram. In some areas, small to medium-sized growers are quite far apart, and a contract harvester may not be available at optimum harvest time or rates.

Table olives are usually hand picked.



Harvesting costs, yields and the price received for olive product need to be carefully considered. Given the developing nature of the olive industry, some caution needs to be exercised in using the information contained in this study. There are no verified long-term tree yields, and this study uses conservative estimates. The oil market dominates market share with an estimated 90%, compared with 10% market share for table olives. Table olive gross margins are also given, to allow comparison with olive oil.

It should be noted that profit will depend very much on the price received for olive products, and that price will depend on quality. Good fruit quality starts with healthy, productive, balanced trees. A good annual yield of quality fruit in the grove remains the key to profitability.

Background

Since the 1990s, there has been major development in the Australian olive industry, and many trees are expected to reach maturity by 2010. The following section gives details on typical operations for a 10 ha (250 trees/ha) olive grove that is well managed, has adequate supplies of water for supplementary irrigation, produces true oil and consists of table varieties that produce average yields of fruit. GST is excluded from the budgets. While limited fruit production will commence at 2–3 years, olive trees can commence production of good commercial crops at 4–5 years, and full commercial production begins at 9–10 years (see table 1). Yields up to year 7 can be highly variable.

The practices, costs and returns were arrived at by consultation with growers and service providers.

The management methods of individual growers will differ according to size of grove, degree of mechanisation, personal preferences, soils, climate, pests, etc.

Budgets

A budget can be defined in a number of ways – for example, as ‘a theoretical financial planning document based on assumptions in advance of the financial spending period’.

The gross margins for each year of development, during establishment to year three and at maturity, provide an estimate of profitability and describe important operations.

Gross margin or enterprise gross margin

The gross margin is probably the most commonly used measure in the economic analysis of farm enterprises. It is a very useful farm analysis and planning tool, but can be misleading if not correctly used and interpreted.

Generally, gross margins are an essential first step in farm budgeting and planning. They can be used as guidelines for making business adjustments. This is commonly referred to as gross margin planning.

A gross margin can be defined as the gross income (total receipts) from an enterprise, less the variable costs (day to day running expenses) incurred in achieving it.

Variable costs are those costs directly attributable to an enterprise that vary in proportion to the size of the enterprise. Variable costs are only incurred if production takes place. Examples of variable costs include tractor running costs, fertiliser and sprays.

The time period used is generally 12 months, or a cropping season.

A gross margin is not gross profit because it does not include fixed or overhead costs, such as depreciation, interest payments, rates and permanent labour, which have to be met regardless of enterprise size. For comparisons, gross margins for crops are expressed in dollars per hectare or dollars per megalitre of water used for irrigation.

Overhead costs are those costs that are incurred regardless of whether or not production takes place. These costs do not vary as the size of an enterprise changes, unless a very large and dramatic change is made. Examples of overhead costs are rates, rent, interest payments, administration (accounting, telephone, postage), wages of permanent employees and general farm insurance.

The gross margin budget can be used to analyse actual enterprise performance. Gross margins are

Table 1. Fruit production by year of tree age.

| | Year of tree age* | | | | | | | | |
|------------------|-------------------|---|------|------|-------|-------|-------|-------|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Tonnes/ha | | | 0.25 | 1.5 | 3.0 | 5.0 | 6.8 | 8.8 | 10 |
| Kg/tree | | | 1 | 6 | 12 | 20 | 27 | 35 | 40 |
| Range | | | | 5–15 | 10–15 | 10–20 | 15–30 | 20–40 | 25–50 |

*Assume for year 1 tree is 600 mm high and has been planted 1 year.

useful for comparing money returns from different enterprises. They can also be useful for finding the effects of a change on the financial returns from the overall farm plan.

Gross margins do not assess the capital required to change enterprises, and generally do not tell whether more or less labour is involved.

A gross margin should be used as a guide only, and will be influenced by:

- resource requirements
- technical efficiency of existing enterprises
- risk
- cash flow
- personal preferences.

The gross margin can be changed to take into account movement in crop and oil prices, changes in seasonal conditions, and individual farm characteristics.

Making comparisons using gross margins

Gross margins should not be used to compare enterprises with vastly different resource needs (e.g. comparing intensive horticulture with livestock grazing).

They can be used – with caution – to make comparisons between farms, or for comparing a farm with district average results.

Gross margins are simplest, most useful and most easily interpreted when they are used to compare similar enterprises (e.g. olive oil and table olives).

Summary

Gross margins:

- are quick and easy to calculate, and a good first step in farm planning
- provide a framework for listing all enterprise costs, thereby allowing for an honest assessment of just how good an enterprise really is
- indicate the relative profitability of different enterprises and the contribution those enterprises will make to payment of farm overhead costs
- allow adjustments to be made amongst enterprises.

Remember, however, that a gross margin is not a profit figure – overhead costs are not taken into account. Caution should be taken when using them to compare enterprises with vastly different resource needs.

Gross margins detailed in the associated spreadsheet are for:

- non-organic olive oil
- organic olive oil
- non-organic table olives
- organic table olives.

Important

See also assumptions of yields, prices, tractor costs, etc. in the development cash flow budget, as details also apply to gross margins.

Example Development cash flow budget (non-organic extra virgin olive oil)

A development cash flow budget is drawn up over the term of development (in this case, 20 years), or earlier when activities are fairly similar from year to year. The outlay of money can be quite large, and the returns may not be obvious for a few years.

The development cash flow budget provides an indication of the number of years required to break even, as well as peak debt or deficit. Interest payments on any monies borrowed are not included in the following budget.

It is usually important to allow for inflation, in order to get a reasonable estimate of the development's finance or credit needs each year. Costs in the budget may be increased by the inflation rate, but, to be conservative, you should not inflate incomes. The following budget does not include finance costs.

Assumptions

Given the developing nature of the industry, local, long-term yield results from recently planted commercial groves are unavailable; the estimates used take into account overseas information and local experiences.

Yields: The yields are possibly conservative; however, biennial bearing and soil moisture constraints (e.g. droughts, dry spells) should be considered. The yields may also be influenced by management of irrigation, nutrition and the grove floor.

Prices: The price of non-organic oil has been averaged (range \$4–\$6/L) for one grade of oil: extra virgin (EVOO). Prices have been falling in recent years due to European competition. Smaller producers are achieving up to \$8–\$10/L. Organic oil prices have been recorded as high as \$12–18/L. The oil produced is sold to a wholesaler. Oil yields range from 16%–25%, considered possible with true oil varieties.

Suggested capital required to set up 10 ha of olive orchard

| | Standard Budget | Your Budget |
|---|------------------|-------------|
| Capital costs for 10 ha (i) | \$ | |
| Trees: 250/ha (8 m x 5 m spacing) including freight @ \$7.50 each | 18,750 | |
| Stakes: 1/tree (36 mm x 38 mm x 2.4 m hardwood) @ \$2 | 500 | |
| Irrigation: Drip/self compensating | | |
| Pumping system (pump, motor, filtration, fertigation) | \$15,000 | |
| Automation \$1000/block, 6 blocks/10 ha | \$ 6,000 | |
| Pipe: Mains 300 m @ \$10/m | \$ 3,000 | |
| Submain 300 m @ \$6/m | \$ 1,800 | |
| Laterals 1250m/ha x 10 @ 50c/m | \$ 6,250 | 32,050 |
| Irrigation headworks (bore, power, dam) | 35,000 | |
| Irrigation water 40 ML @ \$1000/ML (from regulated river) | 40,000 | |
| Roads: Gravelled, internal access 500 m @ \$10,000/km | 5,000 | |
| Mulch: 7 round bales/ha @ \$30 | 2,100 | |
| Contract Fencing: \$6,000/km | | |
| Rabbit netting @ \$10,000/km or | | |
| Hingewire @ \$8,000/km or | | |
| 5 wire barb @ \$6,000 | 6,000 | |
| Tree Guards: @ \$1.50 | 3,750 | |
| Tree Plantings: Shelter belts, windbreaks, not normally necessary for olives but important for biodiversity/shade/shelter @ \$200/ha | 2,000 | |
| Buildings: With concrete floors | | |
| Machinery shed with toilet, 18 m x 9 m x 4.2 m (power extra) | 22,000 | |
| Pump shed | 2,000 | |
| Spray shed plus concrete ramp | 5,000 | |
| Water tank: 45,500 L (10,000 gal) | 3,500 | |
| Equipment | | |
| 80 HP tractor | 42,300 | |
| Pallet fork | 1,350 | |
| Mulcher mower \$11,000 (including 2.1 m slasher \$2,700) | 11,000 | |
| 2.4 m grade blade | 1,200 | |
| Trailing air blast sprayer 2,000L (ii) | 15,200 | |
| 2 x bin trailers (2H) | 1,000 | |
| Organic options | | |
| – Fertiliser spreader 3 cu m \$20,000 (iii) | | |
| – Ride-on mower \$3,000 | | |
| Quad bike 4WD | 11,500 | |
| Herbicide tank + 1.2 m dome sprayer | 2,730 | |
| 4WD cab chassis 2nd hand | 20,500 | |
| Pruning equipment | | |
| – Secateurs – electric power hand | 2,700 | |
| – Reciprocating mower | 1,000 | |
| – Chainsaw | 500 | |
| – Saws, hand secateurs | 500 | 4,700 |
| (i) These prices are indicative for 2004. | | |
| (ii) Purchased in year 3. Up to year 3, options are temporary boom sprayer (used, \$2,000) or contract spraying. | | |
| (iii) Fertigation used for fertiliser. Organic farms may need to purchase a spreader that can also apply manures and compost. | | |
| TOTAL | \$287,130 | |
| Cost per ha | \$ 28,713 | |

Commercial grove sizes

Small < 10 ha (2,500 trees)

Medium 10–40 ha (2,500–10,000 trees)

Large > 40 ha (> 10,000 trees)

Specific gravity of olive oil

Olive oil weighs 0.91 g/ml or 0.91 kg/L

or 1 L = 0.91 kg

or 1 kg = 1.10 L

Example:

14 tonnes fruit/ha, 22% oil

= 14000 x 0.22 = **3080 kg oil**

= $\frac{3080}{0.91}$ = **3385 litres oil**

Converting kilogram and litre pricing

• \$/L to \$/kg.....divide by 0.91
e.g. \$5/L = \$5.49/kg

• \$/kg to \$/L.....multiply by 0.91
e.g. \$5/kg = \$4.55/L

Market price is wholesale price, paid for supply to a major distributor (there is a premium for organic oil). Prices used are:

- large grower – \$5.27/kg (\$4.80/L, range \$4.70–\$4.90)
- small grower – \$9.89/kg (\$9/L, range \$8.00–\$10.00)
- organic grower – \$16.48/kg (\$15/L, range \$12.00–\$18.00)

Oil quality is assumed to be 100% extra virgin (EVOO) grade, and fruit is assumed to have been handled correctly at harvest, during postharvest handling and processing.

Harvest period is mid-April to mid-June.

Tractor used is 80 HP.

Costs

| | |
|-----------------------|------------|
| Labour + fuel | \$24.25/hr |
| Repairs & maintenance | \$5.50/hr |
| Total | \$29.75/hr |

Analysis period is 20 years.

No allowance is made for inflation.

Capital Items are GST exclusive.

Land

An allowance of up to 15% may be made for roads, buildings, soil conservation works, headlands and shelterbelts.

Land costs are excluded from the development budget because of the high variability in area and price.

In the Mudgee area, for example, good, deep, red loam soil on a 20 ha property with a 65 ML water supply is selling for \$405,000 (\$20,250/ha or \$8,201/ac). River flat country is selling for \$24,500–\$49,000/ha (\$10,000–\$20,000/ac), and, off river, a 100 ha property without an irrigation supply is selling for \$1,680/ha (\$680/ac).

Organic certification

Fees will vary between organic certification organisations. The following approved certifying organisations are responsible for inspection and certification of products from organic production (source: AQIS).

- Biological Farmers of Australia (Toowoomba, Queensland)
- Bio-Dynamic Research Institute (Powelltown, Victoria)
- National Association for Sustainable Agriculture Australia (Stirling, South Australia)
- Organic Food Chain (Toowoomba, Queensland)
- Organic Growers of Australia (Lismore, New South Wales)
- Safe Food Production Queensland (Fortitude Valley, Queensland)
- Tasmanian Organic Dynamic Producers (Mowbray Heights, Tasmania)

Example of organic costs

The example certification fee schedule below outlines the costs of certification, as well as the certification process. More details are available from certifying/organic groups.

Annual membership

| | |
|---------------------------|---|
| Certification application | |
| First payment: | Application 1st audit travel Certification fee Soil/tissue tests (3 of each) |
| Second payment: | (Pre certification) 2nd audit fee 2nd audit travel Certification fee |

| | |
|-------------|---|
| Annual fees | Annual audit Audit travel Certification fee |
|-------------|---|

| | |
|--------|--|
| Levies | 1% of gross certified organic production |
|--------|--|

Other fee schedules may apply for export, product assessment, administration, organic product listing, processor, etc.

Production costs

Labour

Labour costs are \$20/hr (\$15 gross plus \$3.75 on-cost, say \$20), to allow for quality labour and possible use of casual/contract labour.

The owner manages the grove and instructs/employs contractors and/or casual staff.

Pre-plant

The importance of soil to the success of a grove should not be underestimated. A thorough soil survey is advisable, employing the services of a qualified soils specialist. An alternative is to do it yourself. First, obtain advice on which procedure to use; an inspection of the landholding before the survey will be necessary to decide on the best method. Flat, uniform topography will be easier to survey and lay out.

The kind of soil preparation required will depend on soil physical and chemical characteristics, topography, working, strip working or whole area, soil survey, and whether production is organic or non-organic.

Planting is a time-consuming operation. It can be completely mechanised, using large tree planters (a variation of vegetable seedling planters), or less mechanised, utilising more hand labour.

It is important to know which harvesting system to use in the grove, and which tree training system will best suit the harvesting system. Layout will be determined by harvesting technology; tree training knowledge will be needed at planting time, and up until at least year four.

Pest control (insects, disease and weeds) will be important, to ensure healthy, balanced tree growth. The number of pesticides necessary will depend on seasonal conditions, local climate and pest activity.

The method of floor management employed in this study comprises a weed-free strip along the tree row, and a mown permanent sward down the middle.

Tree nutrition will be especially important in the first four years. The aim is to grow a strong tree framework as quickly as possible. In later years, water and fertiliser may be used more cautiously, to ensure trees are balanced (and not overvigorous or stressed).

References

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Notes on Property Budget

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (November 2007). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent adviser.

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