



Farm Forestry Field Day

574 Castra Road, Abbotsham

Presented by

Private Forests Tasmania and Carol & Tony O'Neil

10:00am Thursday 4 March 2010

Morning Tea on arrival

Morning Session

1. Introduction

Henry Chan, NW Private Forest Advisor

Tom Fisk, CEO-Private Forests Tasmania

2. Brief history of the property (Tony O'Neil)

(Hobby farm – multiple land-use; cattle; trees; olives)

3. Private Forests Tasmania's involvement

- Special Species Grant (Forestry Commission)
- Blackwood Trial Demo Site – silviculture management

4. Harvesting of the nurse crops

5. Walk through the harvested site

6. Blackwood trial – growth rates & potential returns

Lunch Break – BBQ lunch provided

Afternoon Session

7. Olive venture (Carol & Tony O'Neil)

Olive oil tasting

Oil press process

Walk through the olive grove

8. Conclusion

2. The O'Neil property-“Ark Rest”

Total property area = 13.5 hectares

Soil/Geology – fertile red to reddish brown clay soil (derived from Basalt)

Rainfall = 1200mm per annum

Altitude 100-130m above sea level

The following summary by Tony outlines the achievements they have attained from a small hobby farm. They have clearly maximised the benefits and potential from the property by practising the multiple land-use concept.

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### **Cradle Coast Olive Grove History** (by Tony O'Neil)

Carol and Tony O'Neil purchased their 13.5ha property at Abbotsham in 1977 upon their return from Papua New Guinea where Tony served as a patrol officer with the Department of External Territories commencing in 1971. On return to Tasmania Tony commenced a career in the State Public Service until his retirement in 1976 at which time he was the NW Regional Manager for Health and Human Services non-acute programs. Carol enjoyed a career in geriatric care.

The O'Neils raised their family of three children at Abbotsham renovating the family home, which was the original Abbotsham Post Office, utilizing materials from the Methodist Church at North Motton. The house surrounds have been landscaped centering on the abundant water features. In addition to the blackwood plantation established in 1984 they run 20 or so head of beef cattle, usually belted galloways or murray greys.

Coinciding with their retirement in 1996 Tony and Carol researched options for a land-based project on their property with the aim of augmenting retirement income. The olive industry was in its infancy but after two-three years research and looking at the industry in South Australia and New Zealand the O'Neils committed themselves to planting their grove. The decision was based on lifestyle choice and the fact that olive oil was considered to be the up and coming basic commodity based on sound health and eco principles.

Shortly after planting their grove Tony was headhunted for return to Papua New Guinea in 1997 where he still remains on a fly-in-fly-out basis as Principal of a Training Academy for an oil and gas exploration company. Accordingly Carol is the main keeper of the grove!

Being warned in the beginning that Abbotsham was NOT the place for olive production due to cold and frosts etc the O'Neils opted to fly in the face of expert opinion and the rest is now history. The grove has gone onto produce the finest gold medal extra virgin olive oils in Australia (4x times winner of the National Olive Oil Association annual awards for best in gourmet class) and taken out the coveted Carol L'Heureux trophy for Champion Australian Oil in 2007. In 2009 a state of the art olive oil press was purchased and the O'Neils are now providing contract pressing for others in the industry.

The O'Neils' advice – do your research thoroughly and then don't be afraid to dip your toe in the water!

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Land-uses

- ❖ Cattle grazing (8ha) – 20 head Belted Galloways/Murray Greys

- ❖ Olive grove (2ha) – initially planted 18 varieties; slowly replacing/ replanting/ grafting with 5 best performing varieties
- ❖ Shelter/ woodlots (2.1ha) – Blackwood 0.5ha (outer perimeter pines removed); clearfelled 1.5ha of *Eucalyptus globulus*/ *E. nitens* / *E. delegatensis*
- ❖ Environmental protection – additional trees planted among native vegetation around water dam, head-catchment and streamside

3.Plantation shelterbelt and benefits

During the early 1980s, blackwood was being researched as a plantation resource for a future alternative to offset the native forest supply. From 1982 to 1985, with the assistance of the then Forestry Commission Special Species Grant, the O'Neils planted an area of steep and rocky marginal land.

Blackwood seedlings were interplanted with nurse crop species; one area (0.6ha) with *Pinus radiata* (1982), a second area (0.9ha) with *E. globulus*/*E. nitens* (1984) and a third area (0.6ha) with *E. nitens*/*E. delegatensis* (1985). Although not knowing the potential future returns from the mature trees, the woodlot belt has provided short and medium term benefits such as:

- shelter for the cattle during extreme hot or cold weather;
- shelter for the homestead against prevailing westerlies;
- increased pasture growth (through less exposure to hot and cold winds) and
- providing the micro-climate for the newly established olive groves (planted adjacent to the woodlot belt).

Blackwood and nurse crops

Nurse crop species like eucalypts and pines are used to encourage the blackwood trees to produce a straighter trunk and better form. Unfortunately there was a lapse in active management between 1992-1995 after the pruning had been commenced. This resulted in the intended final crop blackwood trees being progressively suppressed by the more vigorous eucalypts. The blackwood became grossly shaded and over-topped, ending up with very poor form and high mortality.

Fortunately the O'Neils were able to adopt the alternative option, that given another 5 years or so, the faster growing eucalypts instead became the final crop.

Despite the suppression of the blackwood in the pine nurse area, the site was re-evaluated in 1996 and was considered suitable as a trial site to demonstrate several aspects of the potential for blackwood plantation management (see Blackwood Trial section).

Effects on the Olive Groves

From 1996, the O'Neils started their olive venture and planted 18 varieties of olives from the mainland and overseas. One block was established on the upper terrace north of the Blackwood/Nurse crop woodlot belt. The other larger block is to the south-east of the woodlot. The shelter benefit of the plantation has resulted in faster growth of the olive trees with higher yields. By 2004/2005, the O'Neils were concerned with the height of the woodlot trees, casting long shadows and reducing the growth and yield from the olive trees closest to the eucalypt and pine trees.

4.Harvesting of the mature nurse crops

Private Forests Tasmania provided advice in relation to harvesting and marketing. Initially the harvesting operation was scheduled for 2005/2006. The intention was to clearfelled the eucalypt sections in conjunction with the priority removal of the outer perimeter nurse pines as they were retarding the olives and the blackwood crop. Due to the downturn of market conditions at that time and the compounding difficulty of the

small scale of the operation, the harvesting was finally completed in December 2008 / January 2009.

Harvest Volumes and Returns

The three nurse crop species *E. globulus* /*E. nitens* /*E. delegatensis* were marketed together, the bulk of the volume was sold to one processor with a run-of-bush stumpage of \$24.55/tonne.

The outer perimeter Radiata pines were massive trees and they were sold to three processors with a stumpage of \$10.45/tonne for pulp and low grade case logs.

Eucalypts – average 24 years old, 1.5 hectare area.

Total of 21 loads = 583.26 tonnes, total stumpage of \$14,319.

This gives an average of 390 t/ha (merchantable volume per ha) and equivalent return of just under \$10,000/ha. The *E.delegatensis* did not grow nearly as well as the other 2 species but produced some small pulp-logs.

Note: Had the full area of 1.5 ha been planted to *E.nitens/E.globulus*, the predicted yield is approx. 480 tonnes/ha or \$11,800/ha as an unpruned/unthinned stand.

Radiata pine – 26 years old.

Total 10 loads = 267.28 tonnes, total stumpage of \$2,793.

A comparison on a per hectare basis is not valid due to only edge trees being harvested.

5.Walk through the harvested site

Notice the result of good coppicing regeneration of *E. globulus*, but hardly any *E. nitens*. At the time of harvesting, the *E. globulus* and *E. nitens* had mature seed capsules, hence the presence of new seedlings. This means the site is already well stocked with another rotation of trees, but the multiple stems on the coppiced stumps will need to be thinned to keep the best 1 or 2 final crop stems per stump.

6.Blackwood Trial

Establishment - July 1982

Blackwood - 800 stems/ha

Nurse crop of radiata pine - 2300 stems/ha

Planted in 1.8m X 1.8m grid pattern as follows:

X	X	X	X	X	X	X
X	B	X	B	X	B	X
X	X	X	X	X	X	X
X	B	X	B	X	B	X

X X X X X X X

B = Blackwood

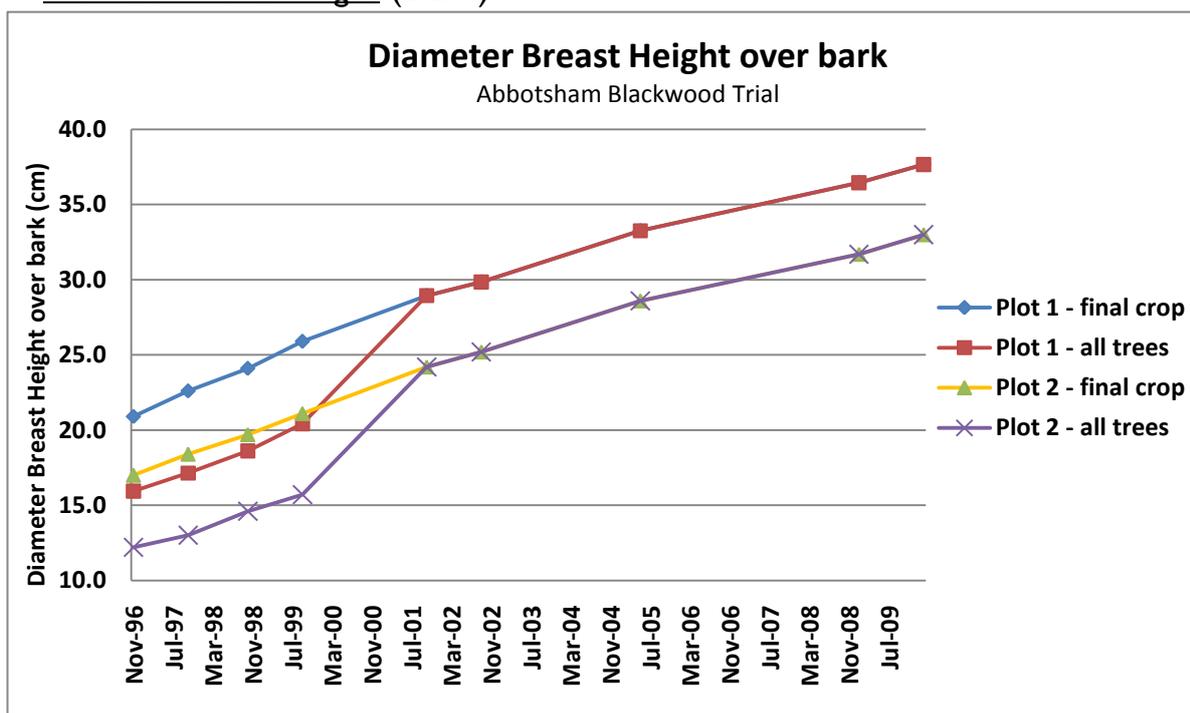
X = Radiata pine (nurse crop)

Stand Management

- 1982 – Planting
- 1986 – Form pruning of blackwood
- 1989 & 1992 – Chemical thinning of nurse crop pines (glyphosate injection); poor success rate.
- 1991 – Blackwood clearwood pruning in one lift to 6.4m. The final crop trees DOS would have been very small (less than 15cm) as the average final crop DBH of the 1996 measurement are 20.9cm (Plot 1) and 17.1cm (Plot 2).
- 1996 – Trial established. Note Plot 1 is in a better part of the stand below a spring fed drainage slope. Plot 2 is a bit drier site and possibly less fertile.
- 1997 - Progressive thinning – ring barking and Tony O’Neil falling cull trees himself after completing TAFE chainsaw course.
- 1999-2000 Blackwood thinning to final crop of 233 stems/ha
- 2008/2009 – Outer perimeter pines removed to release the blackwood final crop trees.

Results to Date

Diameter Breast Height (DBH)



The parallel lines indicate the growing conditions and nutrient supply have been consistent on both sites in the last 15 or so years. It was noted that at the time of the trial establishment, Plot 1 was in a better site below a spring-fed drainage slope, whereas Plot 2 was a bit drier and possibly less fertile.

Thinning of competing nurse crop trees after 1999 resulted in the release of final crop trees and significant increase in diameter by 2002.

Since the outer perimeter nurse pines have been removed, there is a slight increase in DBH growth for both plots, as shown by the last two measurements (Jan 2009 and Feb 2010).

Glossary of forestry terms.

DBH - Diameter at Breast Height over bark. Measured at 1.3 m from the ground surface. Use a calibrated tape if available.

MAI - Mean Annual Increment. The **average** annual rate of growth of wood in the stand, expressed as cubic metres per hectare (m³/ha).

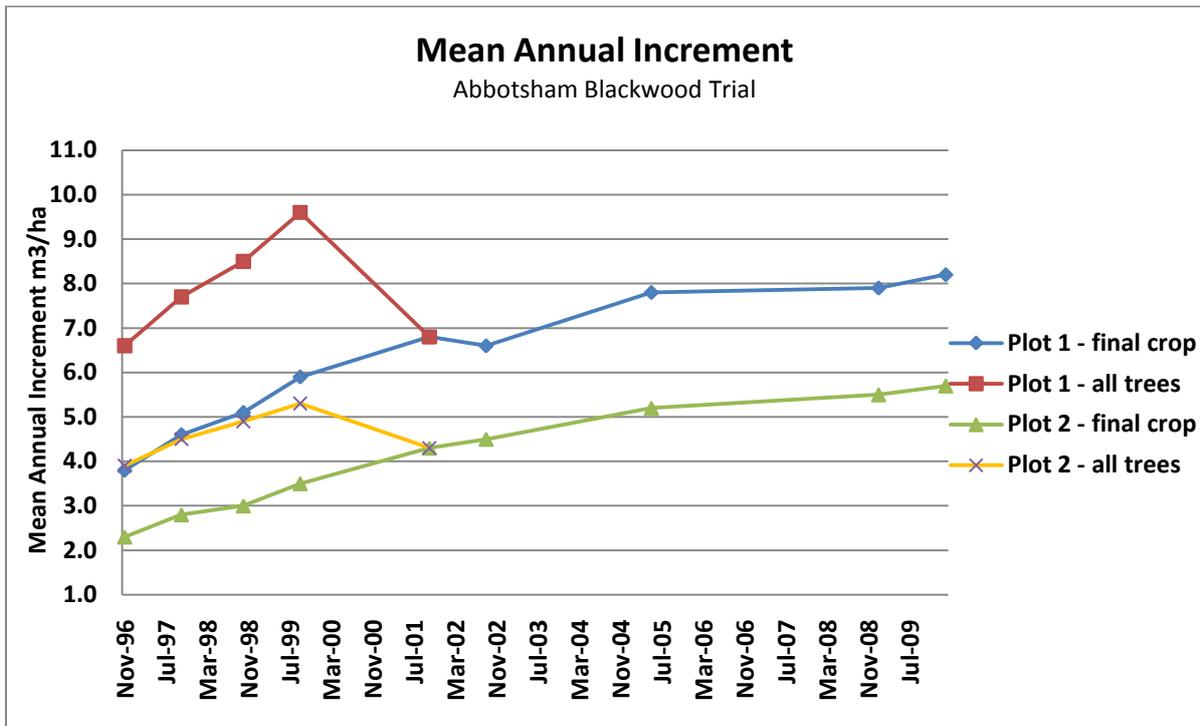
PAI - Periodic Annual Increment. The **average** annual timber increment for any defined short period, such as two years. Relies on regular collection of measurement data (m³/ha).

SED - Small End Diameter. The minimum log diameter, measured at the small end of the log, acceptable for a particular log grade.

Stumpage - The \$ value paid to the grower for forest product sold, net of harvesting & transport costs. ie the \$ value of the log on the stump.

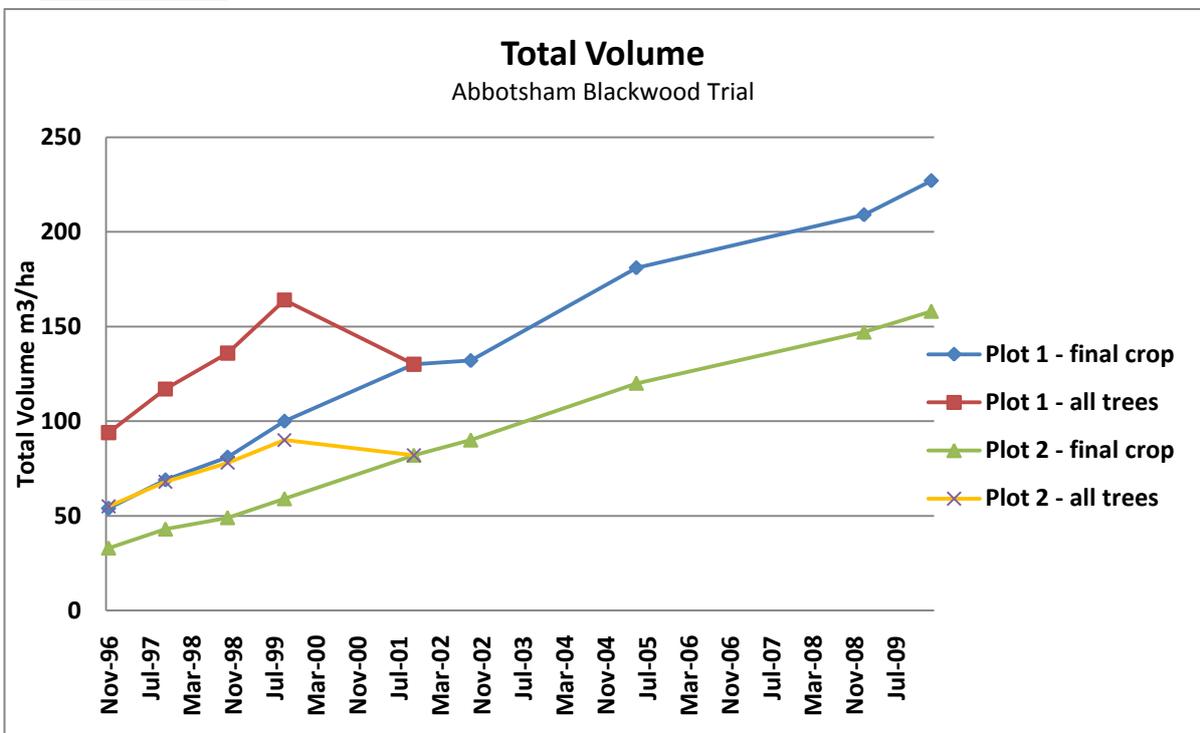
Mill Door Price - The total cost of logs delivered to the purchaser, including all costs and charges of management, harvest, transport, road tolls, stumpage etc.

Mean Annual Increment (MAI)



The MAI lines clearly show the impact of thinning, reducing the total number of trees on the site after July 1999. From then onwards, growth is concentrated onto the selected crop trees only. The overall upward trend of MAI should continue while the trees are actively growing in height and diameter.

Total Volume



This graph shows similar trends as the MAI graph. The drop in volume after July 1999 for the “all tree” lines reflects the thinning of nurse crop trees from the plots. Both plots show a slight increase in total volume increment after the removal of the outer perimeter pines in early 2009.

Growth and Projection

Predicting further growth on Abottsham's Blackwood Trial – planted 1982

Two plots of 0.06 hectare were established in 1996. The plots have been measured in 1996, 1997, 1998, 1999, 2001, 2002, 2005, 2009 and 2010.

Private Forests Tasmania's Farm Forestry Toolbox Inventory Tool and product assessment process was used to estimate tree growth.

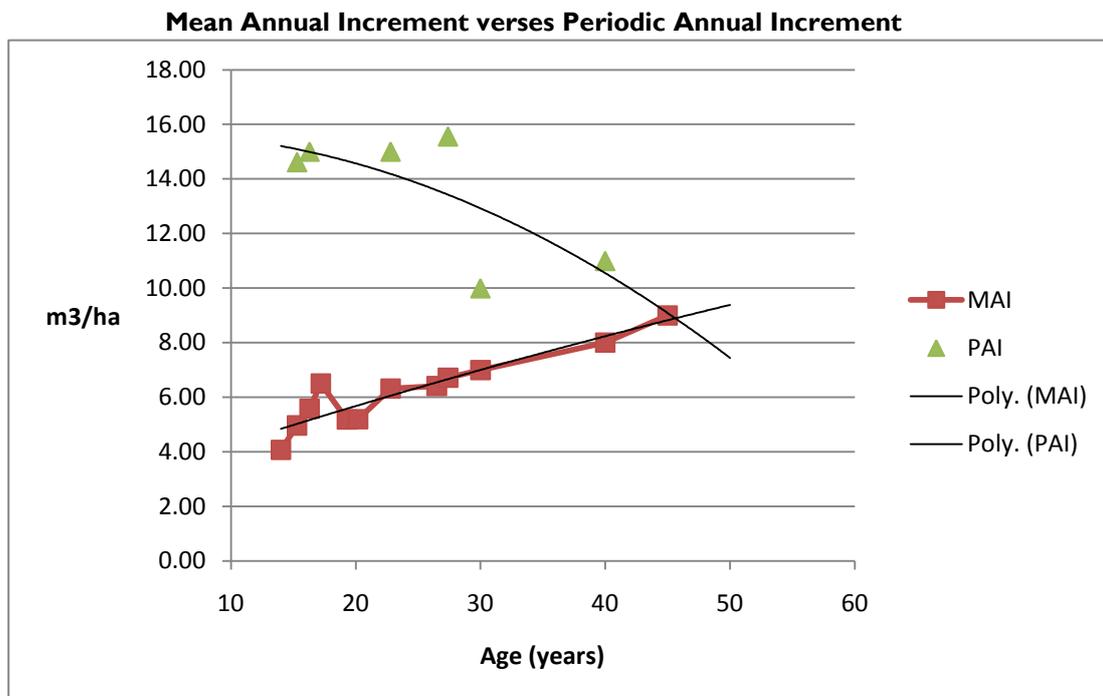
Unfortunately there is no growth model available for Blackwood and hence it is not possible to directly predict final product volumes.

Approach taken

A basic approach using mean annual increment (MAI) and periodic annual increment (PAI) was used. The current inventory (MAI and PAI) was used to create MAI and PAI curves. Trendlines were fitted to these curves and then used to predict future growth trends.

Source data used

Year	Age	Vol m3/ha	MAI m3/ha/yr	PAI m3/ha	Notes
1996	14.0	57	4.07		Current inventory
1997	15.3	76	4.97	14.6	Current inventory
1998	16.3	91	5.58	15.0	Current inventory
1999	17.2	112	6.51		Current inventory
2001	19.3	100	5.18		Current inventory
2002	20.2	105	5.20		Current inventory
2005	22.8	144	6.32	15.0	Current inventory
2009	26.5	170	6.42		Current inventory
2010	27.4	184	6.72	15.6	Current inventory
2012	30	210	7.00	10.0	Projections
2022	40	320	8.00	11.0	Projections
2027	45	405	9.00		Projections



Results

The optimum commercial harvest time is when the MAI and PAI curves coincide. From this data, this is about 45 years when the MAI is 9.0 m³/ha/yr, resulting in 405 m³/hectare. Given a stocking of 233 stems per hectare, the average stem volume would be 1.7 m³.

Tree 27 in Plot 1 currently has a total volume of 1.7 m³. This tree has a DBHob of 49.6 cm @ 1.3 metres with a height of 24.8 metres. If harvested today, this tree will yield a veneer log (1.002 m³ – SED 35 cm, length 7.25m) and two pulp logs (out-spec. logs) (0.696 m³ total volume).

In total, given the prediction above, the total volume is as follows –

Number of stems per ha	Average tree volume (m ³)	Total merchantable volume (m ³ /ha)	Veneer/Cat 4 mix volume (m ³ /ha)	Utility/Out-spec volume (m ³ /ha)
233	1.7	396.1	233.5	162.6

At current stumpages of \$80-\$100/m³ for Veneer/Cat 4 and \$15-\$20/m³ for Utility/Out-spec, the total expected stumpage for the stand is in the range of \$21,100 to \$26,600 at the end of the projected 45 years rotation.

Reliability of the data and prediction

The following should be noted.

- A number of PAI values (5) were excluded from the trendline curves. These values appear to be outliers.
- Polynomial trendlines fitted to the data. The “r” value on the PAI curve is only 0.501
- This prediction seeks to model an ideal outcome given the growth that has already occurred. Further inventory, plus the development of a growth model for blackwood, is required to improve the prediction.

March 2010 (Peter Taylor, Private Forests Tasmania)

Afternoon Session

7.Olive Venture (Carol & Tony O'Neil)

- Research
- Planting – varieties
- Replanting/grafting of best 5 varieties – South Australian Verdale, Paragon, Manzanillo, Sevillano and UCI3A6
- Award winning extra virgin olive oils!!
 - ✓ **Best Oil of Class (gourmet)** 2005,2007, 2008, 2009 - *Australian Olive Oil Association Awards*
 - ✓ **Best Oil of Show** 2007 - *Australian Olive Association*
 - ✓ **Best Tasmanian Olive Oil** and **Best Oil of Show** 2005, 2006, 2007, 2009 – *Wrest Point Fine Food Awards*
 - ✓ Plus many **Gold and Silver medals**
- “**Oliomio 100**” – newly acquired Italian oil press