

Opportunity cropping of sunflowers

This sunflower case study has been compiled by Christine Brown as part of the national Better Oilseeds project

A number of paddocks were planted on Windy Station with monoun-saturated sunflowers last season. Four paddocks were planted in early September and harvested at the end of

February or early March. Three of these paddocks were short fallowed from sorghum and the other was long fallowed from wheat in 2006.

Other paddocks were sown in the late

plant window. The first of these was a paddock that had been sown with pasture seed in the spring but had resulted in poor establishment. As the soil had a good moisture profile and sunflower prices had reached \$885 per tonne, the decision was made to plant an opportunity crop of sunflowers in these paddocks at Christmas.

Another late crop was planted in the first week in January directly into wheat stubbles from winter 2007.

The target yield used for budgeting purposes is 1.75 tonnes per hectare, which is considered achievable even in a dry year at Windy Station. The property has an average dryland yield of sunflowers around 2.0 tonnes per hectare. Average oil content is approximately 38 to 40 per cent and admixture is usually less than one per cent.

WHY GROW SUNFLOWERS?

- Economics. "Generally sunflowers have a better gross margin for us," says Peter.
- Both Keith and Peter find the flexible sowing window a great advantage. "This not only allows for maximum utilisation of available moisture, sunflowers also spread Peter's work load as sunnies can go in early when soil temperature is a bit cool and they are all off before starting sorghum harvest. The flexible planting

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Peter Winton with Loretta Serafin, District Agronomist NSW DPI.

better OILSEEDS

The case study this issue is on Windy Station, Romani Pastoral Co, Liverpool Plains NSW.

GROWER'S NAME

Property manager: Keith Harris. Cropping manager: Peter Winton.

PROPERTY SIZE

21,500 hectares.

LOCATION

30 km west of Quirindi.

ENTERPRISES

The property is split into cropping and livestock areas with a small area that is mixed. The average area farmed annually is 10,000 hectares, of which some may be forage crops for the livestock enterprises.

Summer crop area: 75% sorghum – 25% sunflowers

Winter crop area is approximately 4000 hectares including wheat, canola, barley, triticale and forage crops.

AVERAGE ANNUAL RAINFALL

610 mm.

SOIL TYPE

Black vertosol.

SOIL pH

7.5–8 (CaCl₂).

HISTORY OF PROPERTY

Sunflowers have been grown at Windy Station in the past, however, since taking over cropping management in 2003 Peter has grown them every year. Previously sunflowers have been sold to the de-hulling market and more recently to Cargill on a fixed hectare contract basis through Australian Grain Accumulation Services (AGAS) or Quirindi Grain & Produce.

Peter and Keith always consider crop gross margins, soil moisture reserves, ability to plant on time and world stocks movements, before finalising planting and marketing decisions.

Better Oilseeds is an exciting initiative funded by the Grains Research and Development Corporation and the Australian Oilseeds Federation.

The Better Oilseeds project is addressing the urgent and critical need to lift the productivity of oilseed crops within Australia, specifically canola, sunflower and soybean, to ensure critical mass and consistency of production and to improve the quality of grain produced. The project began in 2006 and aims to increase the value of the Australian oilseeds industry through enhancing productivity and value.

A number of activities are encompassed within the project which includes practical on-farm demonstrations of pertinent agronomic issues for all three crops, field days and forums and grower case studies to share knowledge within the industry.

Watch for a booklet which will include technical information and case studies of canola growers from around Australia to be released this spring. *Australian Grain* will be running a number of case studies on canola, soybean and sunflowers.

Paddock number	Previous rotation	Planted	Harvested	Yielded	Oil content %
Paddock 1	Long fallowed from wheat in 2006	Early September	End of February	Yielded 2.6 t/ha	38–40%
Paddock 2	Short fallow from sorghum	Early September	End of February	Yielded 2.57 t/ha	38–40%
Paddock 3	Sown to pasture in spring 2007. After poor establishment sunflowers were planted late when monounsaturated price reached \$885/t as the soil had a good moisture profile	Christmas 2007	June	Yielded 2.2 t/ha	35–37%
Paddock 4	Directly into wheat stubble from 2007	First week in January	Harvest has been delayed due to rain	A corner of the paddock that has been harvested yielded about 1.8–2 t/ha.	No oils yet. Expected to be around 36–38%
Paddock 5 & 6	Short fallow from sorghum	Early September	March	Yielded 2.54 t/ha	38–41%

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window means that sowing and harvesting sunflowers can be staggered with sowing and harvesting of sorghum," says Keith.

- Sunflowers are important in providing another viable option for their cropping rotations.
- With the livestock enterprises at Windy Station, Peter says that he will grow sunflowers where they have had cattle to break up potential compaction as they are a good natural ripper.
- Less handling of product. "We handle one third the tonnes for the same return as sorghum. Windy Station has lim-

ited storage so this is a big advantage," Keith explains.

Negative aspects of sunflowers

The negatives are manageable says Peter. "Sunflowers are a nice crop to grow but you can be left with horrible weeds. Broadleaf weeds may set seed unless you desiccate which we haven't done, and with the price of chemical now, we would rather wait and use mechanical control."

Sowing window

Normally sunflowers are sown early in the sowing window at Windy Station, otherwise there is sometimes a possible late plant option around Christmas. Planting at the right time is considered important

in achieving high quality sunflowers and crops planted early in the past have done well. So this timing will be aimed for in future but they will plant late if an opportunity arises.

As with any crop at Windy Station sunflowers are not grown if the soil moisture profile is inadequate. Particular care is taken to ensure the crop is planted with sufficient moisture in the soil profile. Agronomist Peter McKenzie takes cores to assess the profile. As a rule of thumb, early plant crops must not have less than 80 cm of moist soil and late plant crops must have a full soil moisture profile.

Paddock preparation

Preparation is no till and the fallow period is used to reduce the weed seed bank. Stubble from the previous crop is conserved and left standing to provide protection for sunflower seedlings which improves the establishment rate.

Sowing and establishment

Sunflowers are planted using a Max-Emerge precision planter on 30 inch row spacing. Seeds are planted at 31,000 per hectare aiming for a target plant population of 29,000 in early planted crops which produces a good head size. Late plant crops are sown at a higher rate of 35,000 seeds per hectare sown to get 32,000 established.

Soil temperature at sowing is not a concern. Stephanie Belfield, former NSW DPI agronomist in the region, explains that sunflowers will germinate under low temperatures and that the greater concern is that they are frost sensitive from 4 leaf onwards.

Varieties

- Peter believes that choosing the right variety is one of the keys to achieving high quality.
- Late plant and early plant crops were Ausgold 62, which Peter says has done well.

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Crop nutrition

Soil testing was conducted prior to planting at 0–10 cm and 10–90 cm depths. A full analysis of the soil was carried out with particular attention to the nitrogen and sulphur levels. Optimising nitrogen availability is considered very important in achieving high quality sunflowers.

This season 400 kg per hectare of sulphate of ammonia was applied preplant for nitrogen and to boost sulphur levels. A pre-mix fertiliser is applied with any other nutrients required. This year's blend contained seven per cent nitrogen, 17 per cent phosphorus, 17.5 per cent sulphur, 1.6 per cent calcium, 2.3 per cent iron and 2.16 per cent zinc. Soil testing will be conducted after the sunflower crop and prior to planting wheat.

Weed control

The main weeds on Windy Station are thornapple, thistles and bladder ketmia. Sunflowers are always planted into a paddock that is clean for weeds. No pre-emergent residual weed control is used. In crop grass weeds are controlled using Verdict.

Pest management

Rutherglen bug is the major insect pest with sunflowers usually sprayed once each

season for control. But this season, three sprays of Fastac have been applied for Rutherglen bug and heliothis every time the Rutherglen bug population became too high.

Disease management

Sclerotinia is managed through rotations and otherwise, diseases are not an issue on the property. This year's crops have been ...38▷



Loretta and Peter in a Windy Station paddock where the "sometimes difficult to manage" sunflower stubble has been knocked down with the *Stubble Cruncher* machine.

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The sunflower stubble is knocked down after harvest using this *Stubble Cruncher*.

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very healthy with leaves at the bottoms of the plants right through to physiological maturity.

Harvesting equipment

All harvesting is carried out by contractors. The Ausgold 62 variety this year had a stalk size that was too big for the harvesting equipment. The gaps in the sunflower trays were too small so the sunflowers kept jamming up. The Sullivan reel also posed a problem as Peter said: "It takes vision away and it takes the driver a while to see that he is blocked up." Peter feels that the equipment needs to have bigger gaps and a different reel for less jamming and better vision.

Management of sunflower residue

The stubble is knocked down after harvest and can be a bit difficult to manage. This year a *Stubble Cruncher* was used which Peter thought had done a good job, although he would like to compare it to a multidisc.

Approximate gross margins

- Sorghum: Income 6.0 t/ha x \$240/t. Less \$880 (approx. cost) = \$560/ha
- Sunflowers: Income 1.8 t/ha x \$750/t. Less \$755 (approx. cost) = \$595/ha

In the past sunflowers have often been sold to the de-hulling market but this year their prices weren't as high as Cargill.

Australian Grain Accumulation Services (AGAS) had higher sunflower prices on hectare contracts, which they sold a large portion of the crop on and also forward sold some of the crop on cash contracts.

"If AGAS dropped the hectare contracts it may influence our decision to plant sunflowers," remarks Peter.

Reliability/robustness

In terms of robustness, sunflowers are like any other crop. If they are planted on 80–90 cm of moist soil they will yield – but with severe moisture stress they will fail. Sunflowers are fairly reliable on Windy Station and Peter says they utilise available moisture well.

Crop compared to other crops

- Sunflowers have biological benefits such as their deep penetrating root system that acts as a natural soil ripper.
- If sorghum prices went up to \$250 per tonne the gross margin would be better than sunflowers at \$750 per tonne.
- A lot more nitrogen is applied on sorghum than sunflowers, therefore sorghum is more expensive in terms of nitrogen.
- Chemical costs for sunflowers are around \$100 per hectare more than sorghum.

Crop intensity

There is no fixed rotation on Windy Station. Moisture is utilised when it is available. This year the early plant sunflower paddocks will be double cropped back to wheat. Normally it would be short fallow to sorghum or double cropped to wheat depending on moisture availability.

An example of a typical crop rotation on Windy Station including sunflowers is:

- Long fallow to sorghum then a short fallow to sorghum the following summer.
- The paddock would then be long fallowed to canola and short fallowed to wheat which has a moderately low VAM dependence but will help to build up VAM after canola for subsequent crops.
- The paddock would then be long fallowed and sunflowers planted, which have a high VAM dependence.

This rotation sequence would be dependent on commodity prices each season as well as what the markets want. ■

YIELD AND SUMMARY 2007–08 SUNFLOWERS

Early plant

- Average yields 2.6 t/ha.
- Oil contents were variable from 38 to 41 per cent
- No trouble with quality specs. "Once we got the header set up right we were 0.3–1.1 per cent admix."

Late plant

- Average yields were down on early plant to 1.8–2.2 t/ha. "A little disappointing as they had looked as though they may have yielded a bit better."
- Oil content results were not fully available at time of publication. Expected to be slightly lower for later plantings.