



Can Double Break crop rotations be effective and profitable across the wheatbelt? Part 2 – Gross Margin

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Key Messages

- Gross Margin for Double break crop sequences ranged between \$150-\$402/ha
- The profitability of double break crop rotations was lower compared to growing continuous wheat in the central wheatbelt

Background

In Western Australia, break crop options are currently limited and there is a high proportion of wheat and barley grown across the WA grain growing region. Cereal crops account for 60-70% of paddocks sown in any one year, with the remaining area sown to a range of crop and pasture types including canola, lupin, clover, volunteer pasture, or left as fallow. The application of these break crops is dependent on the on the presence and severity of biological, chemical, and physical constraints present in each paddock that can impact on the successful growth of the break crop. The use of a single break crop has been an effective tool in managing weed and disease constraints, however, a change in resistance status of many common weeds and population dynamics of soilborne pathogens has reduced this effectiveness. The use of two break crops in a row as a double break crop sequence has been successfully used to increase the grain yield of successive wheat crops in South Eastern Australia, and this study has tested this approach in the WA wheatbelt region.

Four demonstration sites were established in 2017 near Bencubbin, Corrigin, Miling, and Calingiri. These sites were established in paddocks with a history of root diseases or weed populations that a single break crop could not address, and which were sown to a break crop, pasture, or fallow in 2016. In 2017, a range of break crop options were grown on small plots and with the remaining paddock area sown to canola or wheat. All sites were sown to wheat in 2018. Break crop types are presented in Table 1.

Gross Margin was calculated as the income received from the yield and value of grain per hectare based on current commodity prices, minus the variable costs associated with the growing of the crop (including machinery at contract rates). The Net Margin was calculated by further subtracting an allocation of \$150/ha per year for overheads. The Cumulative Gross Margin was calculated as the sum of the Gross Margin for each year and adjusted to net present day value (NPV) by applying a discount of 5%. The Cumulative Net Margin is the sum of the Net Margin for each year adjusted to present day value by applying a discount of 5%.

Results

The Gross Margin for each crop sequence at the Bencubbin and Corrigin demonstration sites are presented in Table 1, where there was a negative gross margin for the fallow treatment in the first year. While conditions were dry in 2017, all break crops at the Bencubbin site achieved a positive Gross Margin due to an effective fallow in 2016 providing excellent weed control and moisture conservation. At the Corrigin site in 2017, chickpea and lentil were the only break-crop to not achieve a positive Gross Margin as there were issues with weed control and the harvestability of these crops due to the dry season. It is important to note that the Bencubbin site was hand harvested while the Corrigin site was machine harvested by the grower and resulted in greater harvest seed loss. This difference in yield assessment method has greatly influenced the comparative

Gross Margin at each site. The Gross Margin for wheat in 2018 at both sites ranged between \$515/ha for Fa/Ca/Wh at Bencubbin to \$1110/ha for Fa/Albus Lupin/Wh at Corrigin. The Net Margin was positive for all crop sequences except those with canola, lentil, and Kabuli chickpea at Bencubbin.

Table 1. Gross Margin and Net Present Value (NPV) of double break-crop rotations at the Bencubbin (Eastern) and Corrigin (Central Wheatbelt) demonstration sites across the 2016 to 2018 seasons. Gross Margin is calculated as gross income minus variable costs, while Net Margin includes cost allocations for machinery use at contract rates and an overhead cost allowance of \$150/ha. NPV gives the discounted value of the future gross margin in today's value at the 5% rate. Fa=fallow, Ca=canola, Le=lentil, Ch=chickpea, Lu=lupin, Fi=field pea, Wh=wheat.

Crop sequence	2016		2017		2018		Cumulative	
	Gross Margin	Net Margin	Gross Margin	Net Margin	Gross Margin	Net Margin	Gross Margin NPV	Net Margin NPV
Bencubbin								
Fa/Ca/Wh	-\$30	-\$204	\$189	-\$87	\$431	\$154	\$515	-\$141
Fa/Le/Wh	-\$30	-\$204	\$117	-\$160	\$641	\$363	\$631	-\$26
Fa/Lu/Wh	-\$30	-\$204	\$299	\$21	\$581	\$302	\$745	\$86
Fa/Kabuli Ch/Wh	-\$30	-\$204	\$137	-\$143	\$641	\$361	\$649	-\$12
Fa/Desi Ch/Wh	-\$30	-\$204	\$437	\$157	\$821	\$540	\$1,077	\$414
Corrigin								
Fa/Albus Lu/Wh	-\$30	-\$204	\$285	\$3	\$971	\$688	\$1,068	\$402
Fa/Ch/Wh	-\$30	-\$204	-\$20	-\$303	\$1,001	\$717	\$818	\$150
Fa/Fi/Wh	-\$30	-\$204	\$106	-\$178	\$1,031	\$746	\$958	\$289
Fa/Le/Wh	-\$30	-\$204	-\$22	-\$307	\$1,031	\$745	\$842	\$171
Fa/Wh/Wh	-\$30	-\$204	\$607	\$321	\$941	\$654	\$1,335	\$661

Discussion

All break-crop sequences tested in the central wheatbelt (Corrigin) were able to return a positive Gross Margin but this was still lower than a cereal dominant crop sequence. These break-crops were effective at reducing weed and disease populations, but the challenge is to further improve the profitability of break-crop sequences. In comparison, the profitability of double break-crop rotations can be increased in eastern wheatbelt where lupins are able to yield higher than canola, and where desi chickpea were higher in grain value than canola. The inclusion of high value legumes such as chickpea and lentil as the second break-crop following fallow gives promise for improved profitability, but further evaluation is required to sufficiently de-risk this crop option for the Eastern and Central Wheatbelt.

The full report can be found on the WMG website www.wmggroup.org.au

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