farmtalk

Locally specific guidelines for grain growers in the Mallee

Ten things to consider when planning a break crop

Break crops can provide significant benefits to Mallee farming systems. This edition of Farm Talk provides 10 factors to consider to make the most of a break crop.

1. What are the benefits of break crops?

Break crops, such as legumes and brassicas, are important in modern cropping systems because of their benefits for managing weed and disease control and nutrition in subsequent cereal crops.

Break crops can benefit subsequent crops by giving growers flexibility to control weeds using chemicals not suitable for use in cereal crops, such as selective herbicides targeting grassy weeds in a broadleaf crop. They also allow for late herbicide applications.

Break crops break the life cycle of crop-specific diseases that require cereal-based hosts, including take-all. Break crops also reduce inoculum levels of pathogens such as rhizoctonia.

Some break crops, notably legumes, increase nitrogen levels in the soil through biological fixation. This can reduce the amount of fertiliser nitrogen required in following seasons. Pre-sowing soil water levels are sometimes higher after a break crop due to their lower water use compared to cereals.

2. How much will a break crop increase wheat yield?

Trials near Karoonda in the SA Mallee, from 2009 to 2012 found legumes, pastures and brassicas gave a consistent cumulative yield benefit of about 1t/ha over three years after a one-year break, where nitrogen was the main limiting factor to yield.

In trials at Mildura and Chinkapook in Victoria where grassy weeds were a significant problem, nine break options were tested. A one-year break of field peas led to an increase of 0.3t/ha in the subsequent wheat crop while canola led to a 0.1t/ha increase. However these benefits only lasted one year. After a two-year break, wheat yields increased by 0.5-1.3t/ha, with a benefit of up to 0.4t/ha observed in the second year of wheat.

3. What are the risks of a break crop

Compared with cereals, break crop yields will almost always be lower, prices and yields can be more variable and, sometimes, growers may not be as certain on best practice management. However, the effect of a well-managed break crop on subsequent cereal crop yields has been shown to be quite reliable.

4. How long does a break need to be to improve nitrogen?

A single-year legume break does improve nitrogen supply to the following cereal crop. So if a break crop is grown for crop nutrition reasons, a single-year may be sufficient.

Depending on the yield potential and soil type, it can be possible to grow a wheat crop after a legume break and not need to apply extra nitrogen. A nitrogen boost to the soil from a legume are highest when the legume is not harvested for grain or hay. This occurs because a large part of the N fixed by a legume is contained in the grain and shoots.

Grower's View

Tim Paschke, Waikerie, SA

"We started using breaks to control brome grass, and now incorporate canola and vetch in our cropping program. We haven't seen a full cycle yet, but results so far are promising."

5. What weed control benefits can I expect?

Break crops allow for more diversity in herbicide and non-herbicide weed control. The increased flexibility for applications of grass-selective herbicides can help reduce grass weed populations. Brome grass can be effectively managed with a two-year break to reduce the seedbank when seed set is kept very low.

Crop-topping, which is a common practice in break crops to reduce ryegrass seed set, is less effective on brome grass due to its early shedding. Alternative herbicide use and cultural methods, such as hay baling, to remove weed seeds are required for best control of brome grass.

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6. How long does a break need to be to manage weeds?

For substantial depletion of the seedbank of common grass weeds such as ryegrass and brome grass, a two-year break is required.

Trials have shown the wheat yield benefits of a break crop when weed control is the major issue are greater from a two-year break compared to a one-year break.

This benefit is for at least the first two years of wheat after the break. By growing breaks that allow the prevention of weed set, grass weed seedbanks can typically be reduced by 98% over a 2 year break.

7. How can they help with disease control?

A single, non-cereal crop free of grassy weeds can reduce rhizoctonia inoculum levels dramatically significantly to a lower disease risk category, across soils in a landscape and seasons, compared to a cereal crop.

All non-cereal crops will reduce inoculum but canola has the largest impact on rhizoctonia.

While the disease break created by growing a break crop is effective and will result in increased yields in the following crop, it only lasts one year.

8. When are break crops profitable?

The price of many pulses used as break crops can be highly volatile with minimal opportunity to forward contract. Growers should be careful not to make a decision to grow a break crop by observing the prices in only one year. A longer term approach should be taken that averages pulse prices over a number of years.

Trials have shown that break crop profitability is largely determined by the benefit in the productivity of cereals grown after the break. Four-year gross margin analysis in the Mallee has shown that including a break is at least as profitable compared to continuous wheat. The benefits of improved weed control can make break crops very profitable compared to continuing with high grass weed populations in cereals.

9. What are factors to consider when selecting a break crop?

An important first step to choosing a break crop is to identify the key factor limiting cereal productivity. Once the limiting factor is identified, the best crop for each particular circumstance can be selected (see table 1). Soil type, machinery capacity and seasonal conditions, including summer rains, break timing and winter forecast, should also be considered when selecting a break crop.

10. What is best practice break crop management?

MSF has compiled a library of information on growing pulses, which can be found online at http://msfp.org.au/resources/growing-legumes-library/.

The GRDC Canola Best Practice Guide is available at: http://www.grdc.com.au/CanolaBestPracticeGuide

Where can I find more information?

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A full list of research cited in this Farm Talk is available at www.msfp.org.au.

TABLE 1: Break crop choices

Situation	Canola	Oats	Lentils	Peas	Chickpeas	Legume dominant pasture
I want to control grassy weeds	✓	o	✗	o	o	o
I want to increase nitrogen	✗	✗	✓	✓	✓	✓✓
I want to reduce disease inoculum levels	✓	o	✓	✓	✓	o
I have sandy soils	o	o	o	✗	o	o
My terrain is rocky	o	o	✗	✗	o	o
Hay isn't suitable for me	o	✗	o	✗	o	✓

✓: Ideal for this situation, ✗: not likely to be the best option, o: can be suitable

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