

Summer weed control



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Take home messages

- *The benefit of summer weed control can vary across soil types and conditions.*
- *Conserving summer soil moisture is generally money in the bank and can prove invaluable when there is a dry finish, although the benefits seem to differ according to soil type.*
- *Higher glyphosate prices means that growers need to become more efficient when controlling weeds. Targeting weeds while they are young and fresh will help with reducing glyphosate rates. The addition of residual herbicides, such as Ally[®], will reduce the need for follow-up spraying.*
- *When spraying for weeds over summer, it is important to remember that chemical efficacy is reduced when conditions are hot, dry and dusty. Spraying at night usually provides the best conditions.*

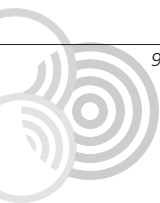
Background

In the 2004/05 summer, BCG conducted a summer weed trial on medic stubble 20km north of Birchip. The soil was a Mallee clay loam soil with high boron levels at 40cm depth (>20ppm). Rainfall over the summer was 191mm. Controlling summer weeds (heliotrope and melons) by cultivation resulted in a significant increase in wheat yield. However, on a different soil type without subsoil limitations (such as sands), it is possible that chemical control methods would have had equal or better results than cultivation techniques. It was determined after the 2004/05 summer that it is important to control summer weeds, but the best practice for weed control or moisture conservation can vary according to soil type.

In light of these earlier findings, BCG decided to investigate the effect of stubble in terms of moisture conservation. In December 2006, a trial was established at Narraport to compare both cultivation and chemical weed control on both bare ground and stubble retained for soil moisture conservation. One of the benefits of stubble retention is the reduction in evaporation during the season. Previous findings have shown up to a 50 percent reduction in evaporation during the growing season where stubble has been retained (55mm evaporation) compared to bare ground (110mm evaporation).

Methods

Location:	Narraport (15km east of Birchip)
Replicates:	Four
Treatments:	5 treatments x 2 comparisons (bare ground vs slashed stubble)
Plot size:	36m x 100m



Crop (variety): Wheat (Yitpi)
 Sowing date: 26 May 2007
 Seeding density: 175 plants/m²
 Seeder: BCG no-till seeder (knife points, press wheels)
 Fertiliser: SuPreme Z at 50kg/ha (N 11%, P 21.8%, S 4%, Z 1%)

The trial compared five control practices to determine the best weed management strategy for summer months on this particular soil type. The treatments used in this trial are listed in Table 1.

Table 1. List of five weed management strategies used as treatments in this trial.

Treatments	Description	Timing	Rate
1. Control		No Weed Control	
2. Cultivation + knockdown (as required)	As required determined by the presence of weed	Determined by the 13 Feb 2007	No further weed control required
3. Cultivation (as required)	As required determined by the	Cultivated once on 13 Feb 2007 presence of weeds	No further weed control required
4. Knockdown (as required)	As required determined by the presence of weeds	14 Feb 2007	1.5l/ha RoundupCT® + 0.2% wetter
5. Knockdown + residual	One application	14 Feb 2007	1.5l/ha RoundupCT + 5g/ha Ally + 0.2% Wetter



To compare the effect on soil moisture conservation, nitrogen mineralisation and weed control, the five treatments were applied across two soil conditions. Straw was applied across half of the plots (equivalent to a 2t/ha wheat stubble) and the treatments were repeated to give a comparison between bare ground and stubble (slashed).

Results

A total of 97mm of rain fell between November 2006 and February 2007 (Table 2), which is decile 8 rainfall for the summer period. Good weed germination occurred across the site as a result.

Table 2. Monthly rainfall figures for Narraport for 2006/07.

	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total
2006/07	19.5	17.5	54	6	35	39	69	15	31.5	5.5	18	1	311
Ave (1898-1995)	26.5	23.6	20.5	24.5	23.1	25.2	38.5	38.0	38.1	38.5	39.2	38.2	375.9

Heliotrope and volunteer cereals were the dominant weeds present. Caltrop (Bindii) and melons were also present although numbers were patchy across the trial. The majority of volunteer cereals were present in the stubble plots.



Weeds counts were conducted after the treatments had been applied. The cultivated and chemical treatments had low weed numbers (average 5 plants/m²) compared to the control plots (87 plants/m²). Previous BCG work during the summer of 2004/05 found that heliotrope is a summer weed that can cause significant loss of moisture, with up to 80mm of available moisture lost under heavy heliotrope populations.

No significant differences in yield were observed between treatments (Table 3). The effect of stubble also failed to show a difference in terms of grain yield despite looking visually better prior to harvest. With no difference in grain yield, the control plots were the most economical due to the low input costs associated with this treatment.

Table 3. Wheat grain yields, input costs, and gross margins for each treatment.

Treatment	Grain yield(t/ha)	Cost(\$/ha)	Gross margins (\$/ha)
Control	0.6	157	82
Cultivation + knockdown (as required)	0.7	179	60
Cultivation (as required)	0.6	175	64
Knockdown (as required)	0.6	175	64
Knockdown (as required) + residual	0.6	175	64
Significant Difference	NS		
LSD (P<0.05)	0.3		
CV %	10.3		

The results in Table 3 are contrary to what was found in 2005, highlighting the importance of continuing research into the benefits of controlling summer weeds. It seems the benefit of summer weed control varies according to soil type and a general recommendation across a range of soil types, at this stage of research, can be unreliable. It is possible that the lack of yield response at Narraport may be due to the moisture being stored below the accessible root zone. This inconsistency in yield response from summer weed spraying has been a comment from a number of farmers on similar soils and needs to be investigated further.

Commercial practice

- Weeds will generally germinate over summer when significant rainfall events (>25mm) occur. Knowing if that moisture is worth conserving or not is always going to be a difficult decision, more so now with the price of Roundup over \$10/L.
- Controlling summer weeds should be considered as an investment for the next crop. There are two important research questions that appear to be influenced by soil type and that will be investigated by BCG over the next few years:
 - What amount of rainfall is required on particular soils before a benefit is achieved from spraying summer weeds?
 - Which practice is best suited to particular soils: stubble retention or cultivation?

