

Annual Ryegrass Control in the HRZ

Frances Crop Walk with Dr Chris Preston

“Development of local strategies to enable the integrated and profitable management of annual ryegrass seed banks in high rainfall zone farming systems of the Southern Region”

Annual ryegrass seed banks in the high rainfall zones (HRZ) of Australia tend to be high and there is late emergence of weeds due to the long and cool growing season. These late emerging plants contribute to high seed set that maintains populations. As a result, annual ryegrass populations quickly rebound when management pressure is reduced.

Which weed management strategies provide effective and profitable management of ryegrass in the HRZ?

Frances is one of several demonstration sites established across SA & Vic HRZs.

- Each site has 4 management strategies, with increasing intensity.
- Management strategies for each site are developed with local agronomists.
- Frances was sown to faba beans in 2020.

Frances Management Plans 2020: Faba Beans sown 5th May

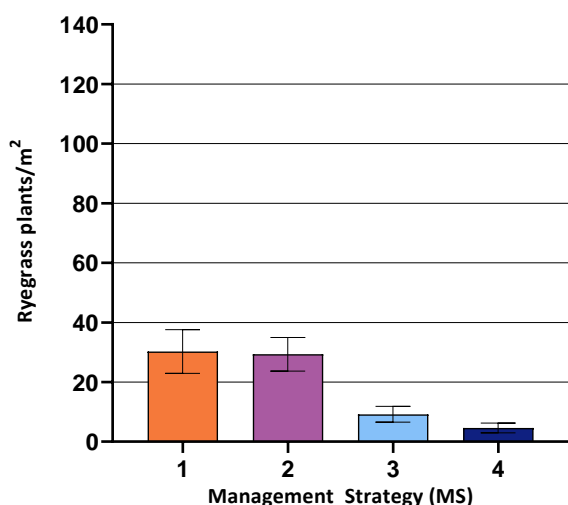
Timing	MS 1 (lowest input)	MS 2	MS 3	MS 4 (highest input)
Dec 2019: Crop Top	-	-	Weedmaster DST (3 L/ha)	
Pre-sowing knockdown	Roundup Ultramax (1.5 L/ha) + Sharpen (24gm/ha)			
Pre-emergent	Propyzamide (1kg/ha) + Terbyne Xtreme (1 kg/ha)			
Post-emergent	Clethodim (500 mL/ha)		Clethodim (500 mL/ha) + Factor (180 g/ha)	
Harvest management (Crop top)	Weedmaster DST (1.1 L/ha)	Weedmaster DST (2.1 L/ha)	Weedmaster DST (1.1 L/ha)	Weedmaster DST (2.1 L/ha)

Frances 2020: Management Strategy vs Ryegrass Control

- Ryegrass establishment was reduced by 88 % under MS4, compared to MS1
- Mid-season ryegrass control was improved by the addition of Factor[®] post-em, compared to Clethodim alone.
 - 22 % (MS2) vs 74 % (MS3) fewer ryegrass plants mid-season, compared to 4 weeks after sowing.
- Upcoming assessments: ryegrass heads/m², crop yield, crop-topping effect

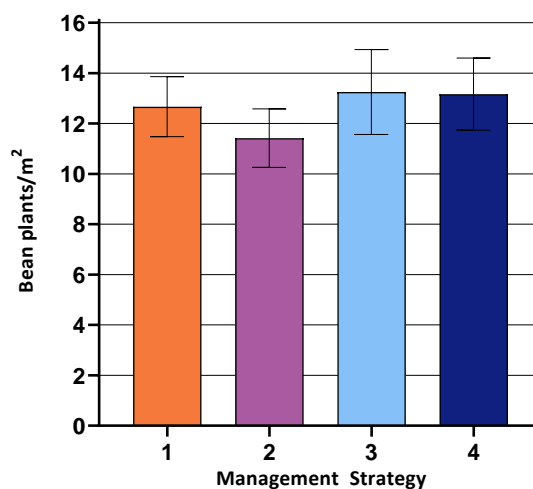
Effect of crop topping wheat.

Glyphosate Dec 2019. Ryegrass counted Mar 2020.



Management strategies 1 & 2 are significantly different to 3 & 4. (P value = 0.0003).

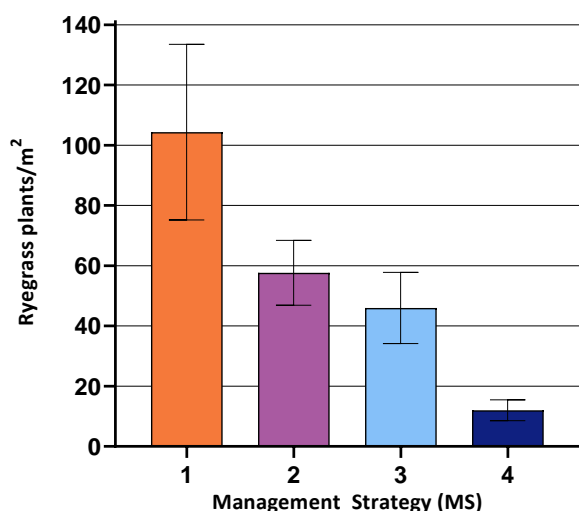
Crop establishment: Faba Beans July 2020



No significant difference between management strategies (P value = 0.7731).

Ryegrass establishment:

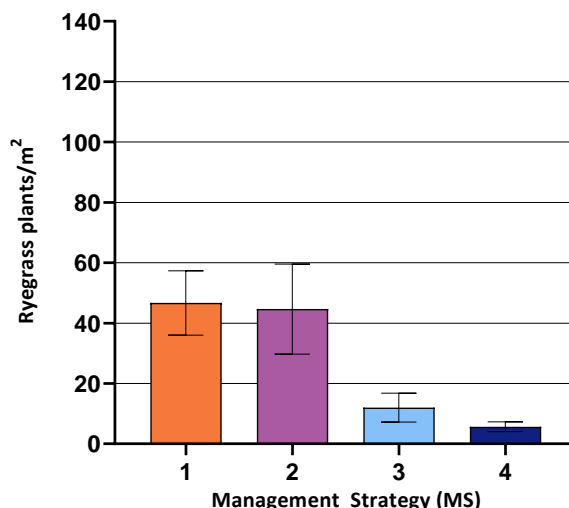
4 weeks after sowing



Significant difference (sd) between management strategies:
 MS 1 sd to MS 3&4 (P value = 0.0082 & <0.0001)
 MS 2 sd to MS 4 (P value = 0.0011)
 MS 3 sd to MS 1&4 (P value = 0.0082 & 0.0266)
 MS 4 sd to all others

Ryegrass mid-season:

4 weeks after post-emergent herbicide treatments.



Significant difference (sd) between management strategies
 MS 1 sd to MS 3&4 (P value = 0.0198 & 0.0001)
 MS 2 sd to MS 4 (P value = 0.0006)

Frances Management 2019: Trojan Wheat sown 15th May

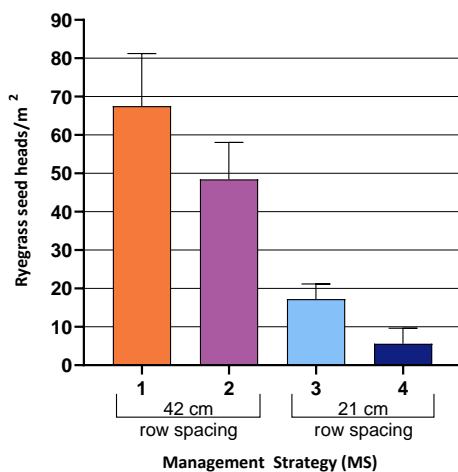
Timing	MS 1 (lowest input)	MS 2	MS 3	MS 4 (highest input)
2018 Harvest management	Weedmaster DST (1.1 L/ha)	Weedmaster DST (2.2 L/ha)	Weedmaster DST (1.1 L/ha)	Weedmaster DST (2.2 L/ha)
Pre-sowing knockdown	Glyphosate (2 L/ha) + Goal (75 mL/ha)			
Pre-sowing double knockdown	-	-	Spray Seed (2 L/ha)	
Row spacing	42 cm		21 cm	
Pre-emergent	Sakura (118 g/ha) + Avadex Xtra (2 L/ha)			
Pre-emergent (extra/ha)	-	-	-	21 kg N, 15 kg P, 11.5 kg S.
Post-emergent	-	-	-	Boxer Gold (2.5 L/ha)

Frances 2019: Management Strategy vs Ryegrass Control & Yields

- The pre-sowing double knock tactic in MS3 and MS4, coupled with the increased crop competition from tighter row spacing, resulted in more effective ryegrass control than for MS1 and MS2.
- MS4 was the most effective management strategy, with the lowest ryegrass seed heads produced and highest yields.
- Economics: MS4 despite being the most expensive had the highest gross margin.

	Yield Income /ha	MS Expense /ha	Gross margin /ha	Expense vs MS1	Income vs MS1
MS1	\$ 2,056	\$ 81	\$ 1,974	-	-
MS2	\$ 2,059	\$ 87	\$ 1,972	7%	0%
MS3	\$ 2,208	\$ 100	\$ 2,107	23%	7%
MS4	\$ 2,353	\$ 158	\$ 2,195	94%	14%

Effect of MS on ryegrass seed heads in 2019



Yields Wheat 2019

