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Crop & Pasture Science

Supplementary Material

Taking shortcuts: lowering harvest height to restrict colonisation of cereal stubble by *Fusarium* pseudograminearum

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*Correspondence to: Toni Petronaitis University of New England, Armidale, NSW, Australia Petronaitis Email: tpetrona@une.edu.au **Supplementary Table S1.** Model and treatment structure for the different response variables, the year/s measured, and any transformations applied. The response variables broadly fit into four categories (given in bold), being those measured at the plot level, those measured at the plot level over time, those measured at the plot level over time and depth, and those measured at the tiller segment level over time. Where transformations only apply to data from one experiment, the experiment name is given as BR (Breeza) or NA (Narrabri). Note that the two experiments were analysed separately.

Response variable	Season/s	Transformation	Model and treatment structure			
<i>Fp</i> incidence (2019 durum stubble)	2019 2020 2021	Square root (BR) Arcsine square root (NA)	Model category	Tiller segment over time		
			Treatment structure	Maximal plot level treatment structure + additional fixed effects for: sampling time & tiller segment + all associated interactions between these and existing terms		
			Random terms	Plot level experimental design structure + all associated interactions between existing terms and sampling time and tiller segment		
			Residual variance structure	Unstructured residual covariance model to correlate repeate samplings (sampling time and tiller segment) of same plot		
Soil moisture content	2019 2020 2021		Model category	Plot level over time and depth		
			Treatment structure	Maximal plot level treatment structure + additional fixed effects for: sampling time & depth + all associated interactions between these and existing terms		
			Random	Plot level experimental design structure + all associated		
			terms	interactions between existing terms and sampling time and depth		
			Residual variance structure	Unstructured residual covariance model to correlate repeated samplings (sampling time and depth) of same plot		
Maximum height of <i>Fp</i> colonisation (2019 durum stubble)	2019 2020 2021	Square root (BR)	Model category	Plot level over time		
			Treatment structure	Maximal plot level treatment structure + additional fixed effect for: sampling time + all associated interactions between this and existing terms		
			Random terms	Plot level experimental design structure + all associated interactions between existing terms and sampling time		
			Residual variance structure	Unstructured residual covariance model to correlate repeated samplings (sampling time) of same plot		

	2019 2020	Square root (BR, NA)	Model category	Plot level over time with embedded factorial treatment structures	
Total <i>Fp</i> DNA (2019 durum stubble)			Treatment structure	Maximal plot level treatment structure + additional fixed effect for: sampling time	
stubble				+ all associated interactions between this and existing terms	
				+ Embedded factorial treatment structures described in text	
<i>Fp</i> trash DNA (2019 durum stubble)	2019 2020	Log (BR, NA)	Random terms	Plot level experimental design structure + all associated interactions between existing terms and sampling time	
			Residual variance structure	Unstructured residual covariance model to correlate repeated samplings (sampling time) of same plot	
Yield			Model category	Plot level	
Chickpea establishment			Treatment structure	Maximal plot level treatment structure - <i>Crop species</i> term and associated interactions	
Chickpea pod height	2020		Random terms	Plot level experimental design structure	
<i>Fp</i> DNA (2020 header trash)		Log (BR, NA)	Residual variance structure	Simple residual variance model	
Yield			Model		
Grain screenings	Grain screenings		category	Plot level	
Grain protein			Treatment structure	Maximal plot level treatment structure	
1000 grain weight	2021				
Crown rot index			Random terms	Plot level experimental design structure	
<i>Fp</i> incidence			Residual variance structure	Simple residual variance model	

Supplementary Table S2. Treatment structure for the different response variables, the year/s implemented, and number of treatments subsequently duplicated per replicate to allow for the final number of treatments in 2021.

Treatment	Harvest height	Harvest trash	2019	Harvest trash / Shallow tillage	2020	Cereal cultivar	2021
1	Short	Retained	4	Retained / Kelly-chain	2	Durum wheat	1
2						Bread wheat	1
3				Retained / Intact	2	Durum wheat	1
4						Bread wheat	1
5		Removed	2	Removed / Intact	2	Durum wheat	1
6						Bread wheat	1
7	Medium	Retained	4	Retained / Kelly-chain	2	Durum wheat	1
8						Bread wheat	1
9				Retained / Intact	2	Durum wheat	1
10						Bread wheat	1
11		Removed	2	Removed / Intact	2	Durum wheat	1
12						Bread wheat	1
13	Tall	Retained	2	Retained / Kelly-chain	2	Durum wheat	1
14						Bread wheat	1
15				Retained / Intact	2	Durum wheat	1
16						Bread wheat	1
17		Removed	4	Removed / Intact	2	Durum wheat	1
18						Bread wheat	1
Total	6 treatments in 20	19		9 treatments in 2020		18 treatments in	2021



Supplementary Figure S1. Photos of the harvest height and harvest trash treatments implemented in durum wheat stubble inoculated with *Fusarium pseudograminearum* in year 1 of experimentation (2019 season) (Narrabri, NSW).



Supplementary Figure S2. Amount of Fp DNA (pg DNA/g stubble x 10³) present in the trash fraction collected post-harvest at Narrabri (a) and Breeza (b) in May and November 2020 (averaged across sampling times). Error bars represent the approximate back-transformed standard error of the mean.



Supplementary Figure S3. Amount of Fp DNA (pg DNA/g) present in the chickpea trash collected post-harvest at Narrabri (a) and Breeza (b) in 2020. At Narrabri, a significant height x trash interaction was observed (P = 0.04). At Breeza, a main effect of trash was detected (P = 0.01). Error bars represent the approximate back-transformed standard error of the mean.



Supplementary Figure S4. Incidence of Fp (%) in cereal stubble of DBA Lillaroi and LRPB Hellfire collected after harvest at Breeza in 2021. Crops were grown under a range of different cereal stubble management scenarios, specifically stubble height (cm) and trash treatments. Error bars represent the standard error of the mean.