



# THE IMPLICATIONS OF SPATIALLY VARIABLE PRE-EMERGENCE HERBICIDE EFFICACY FOR WEED MANAGEMENT

Helen Metcalfe, Alice Milne,  
Richard Hull, Alistair Murdoch,  
Jonathan Storkey



University of  
**Reading**



ROTHAMSTED  
RESEARCH

# SEEDLING DRYWEIGHT



Flufenacet

Pendimethalin

ED50

0.0711

0.1238

ED50

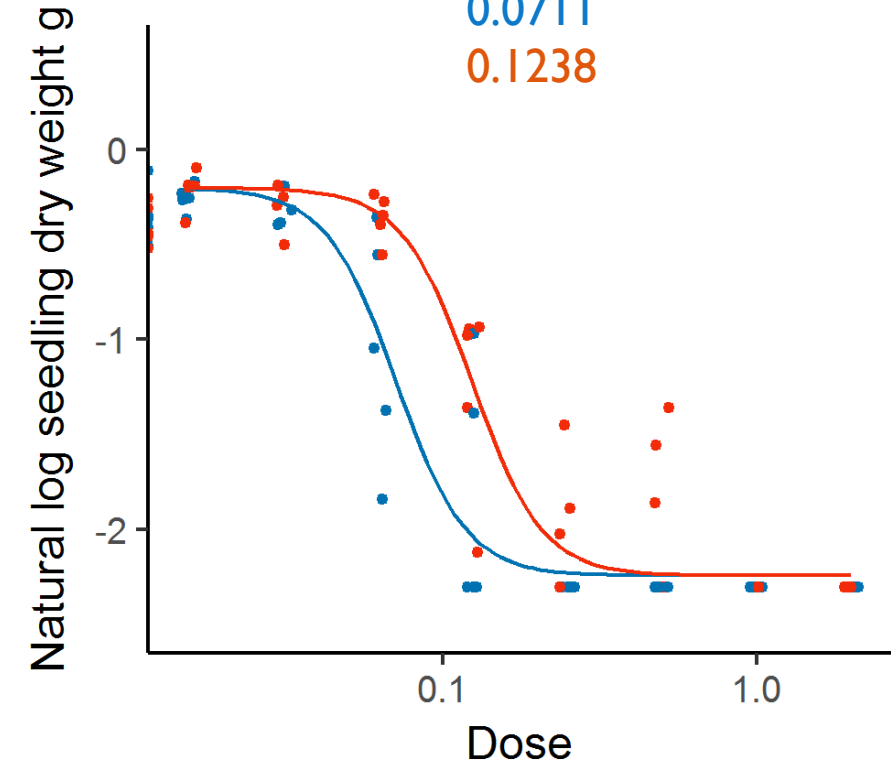
0.1997

0.3932

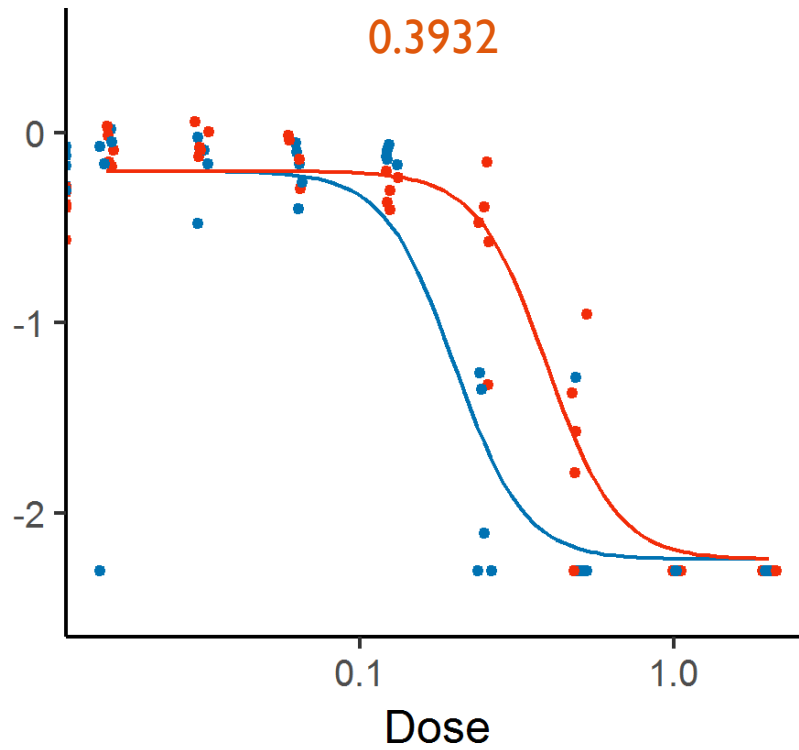
ED50

0.4374

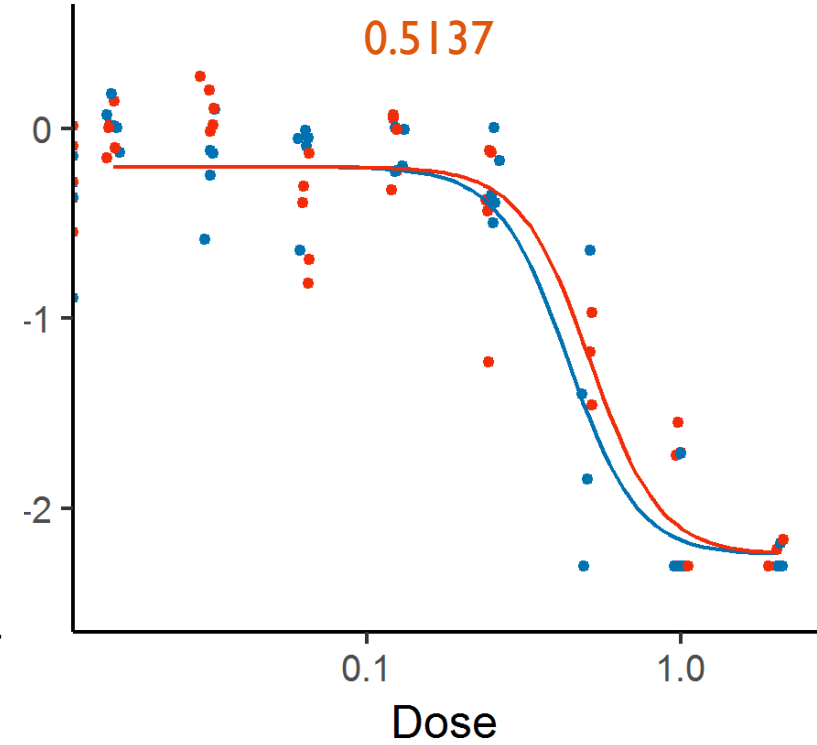
0.5137



Low SOM



Medium SOM



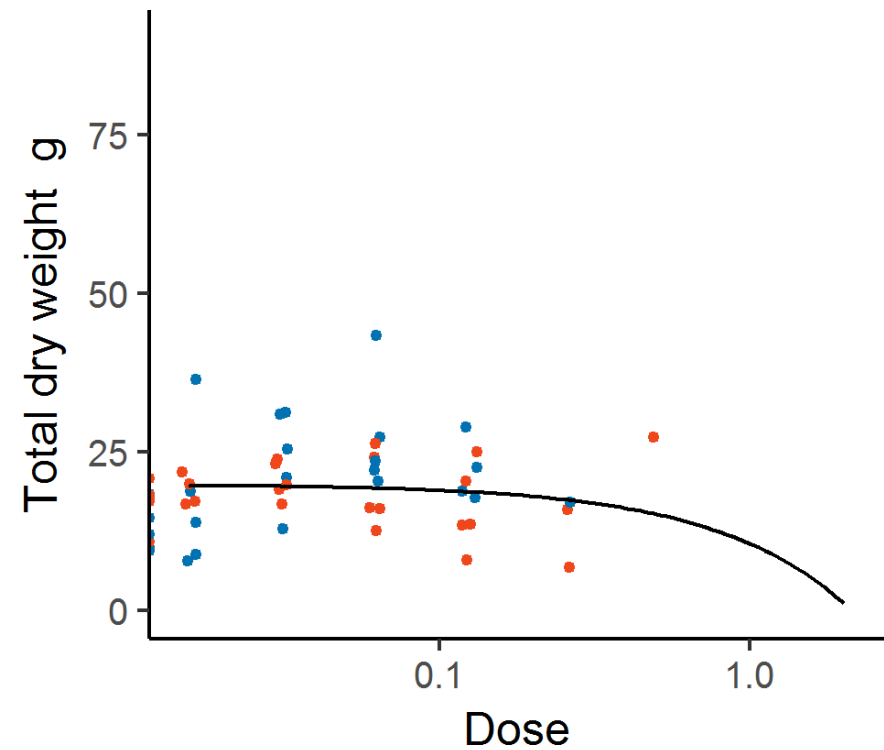
High SOM

# MATURE PLANT DRYWEIGHT

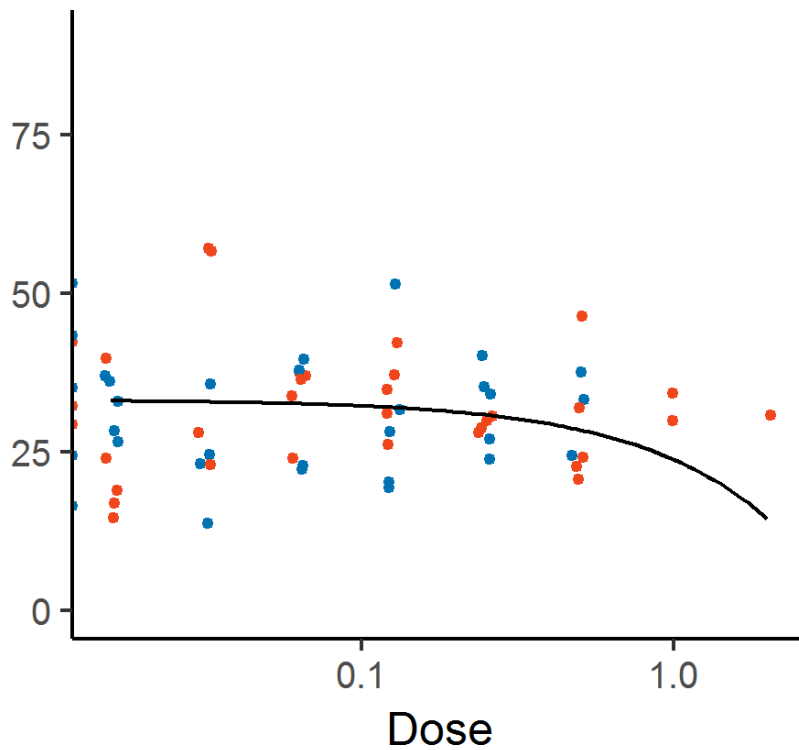


Flufenacet

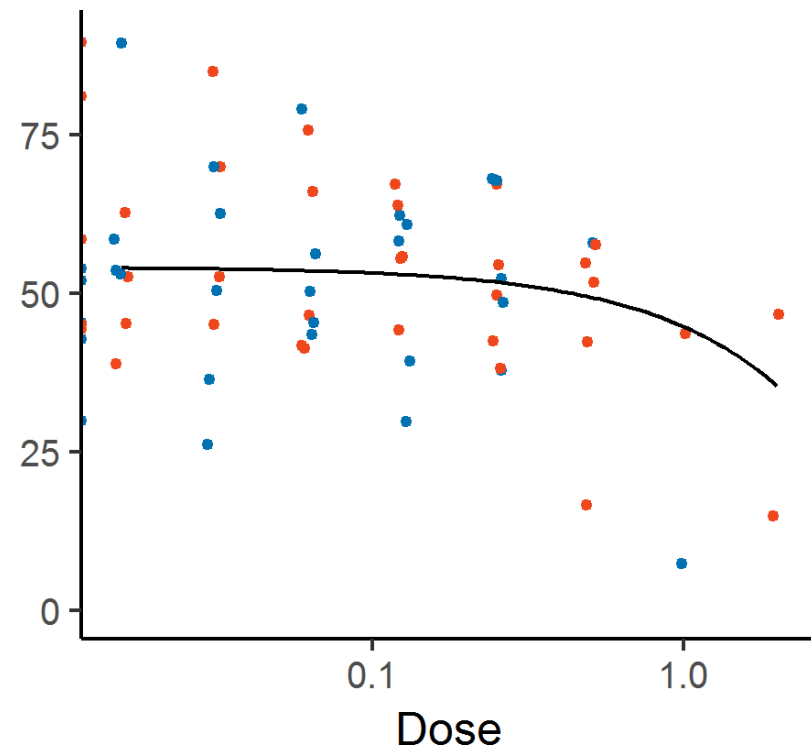
Pendimethalin



Low SOM

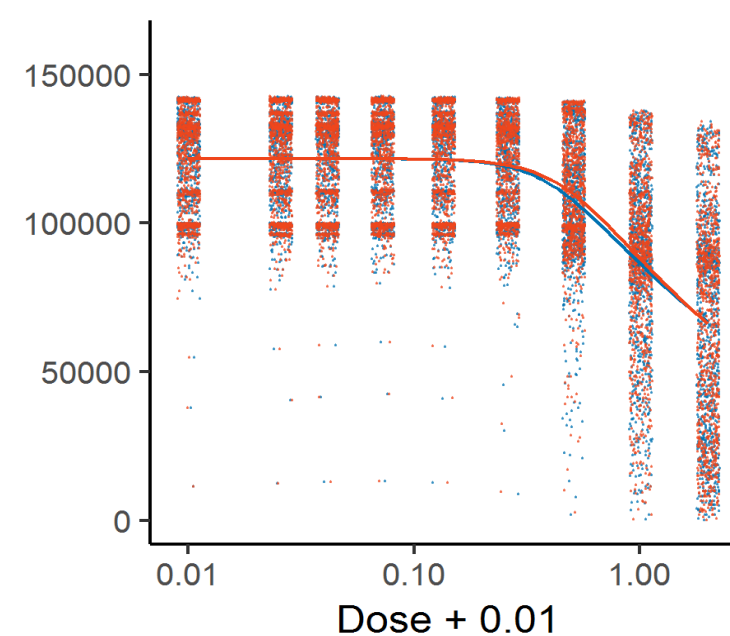
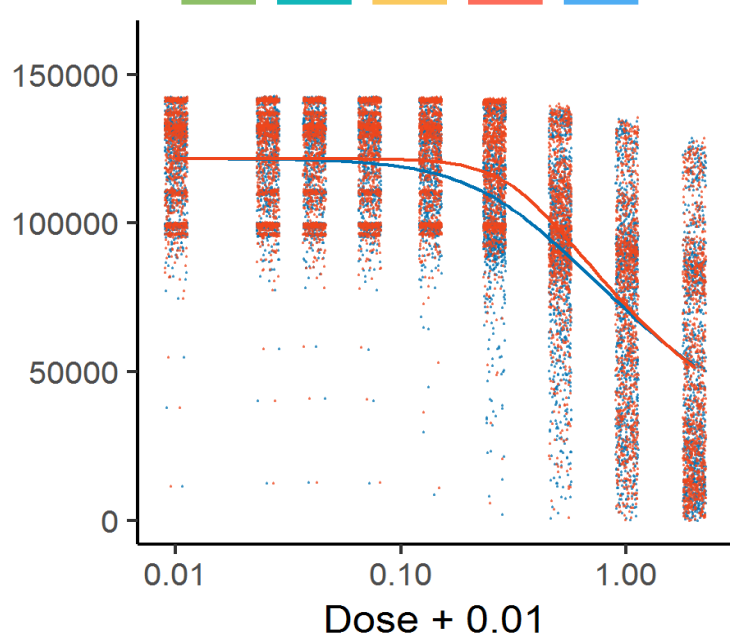
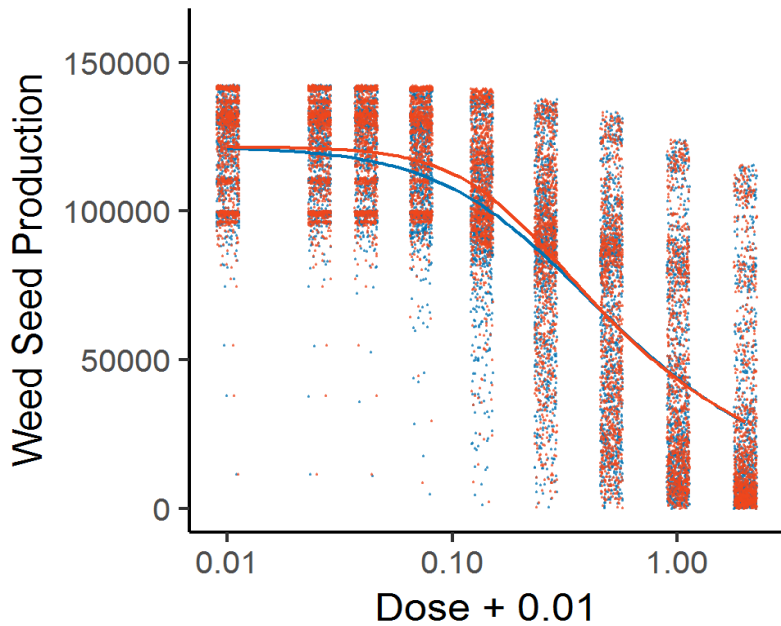


Medium SOM



High SOM

# MODELLING



No Crop Competition

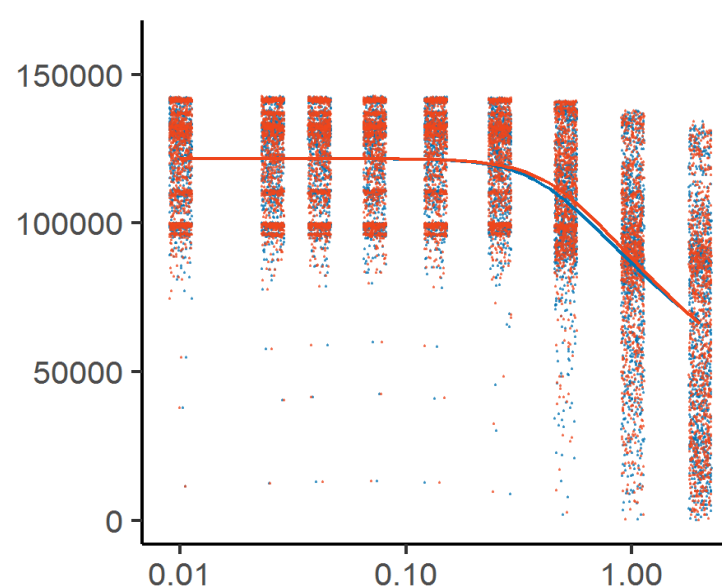
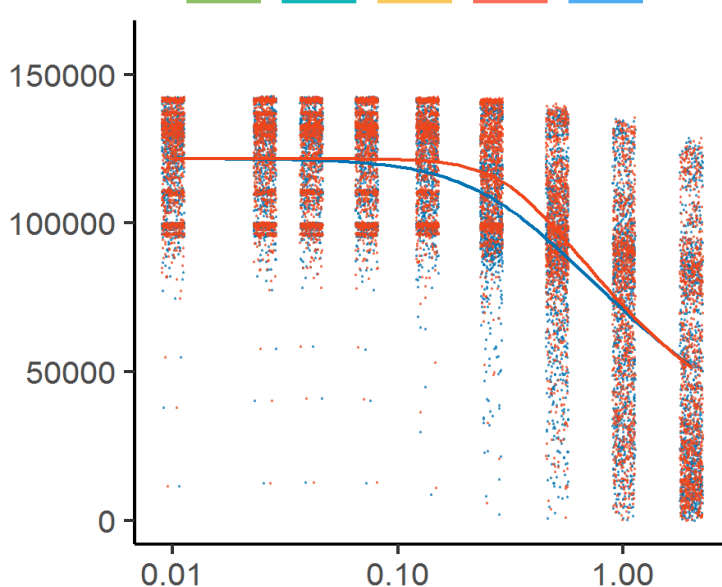
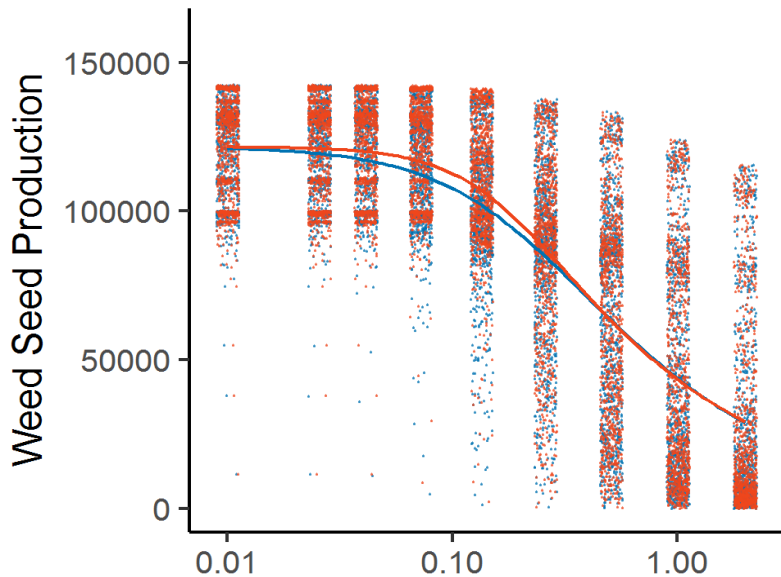
Crop Competition

Low SOM

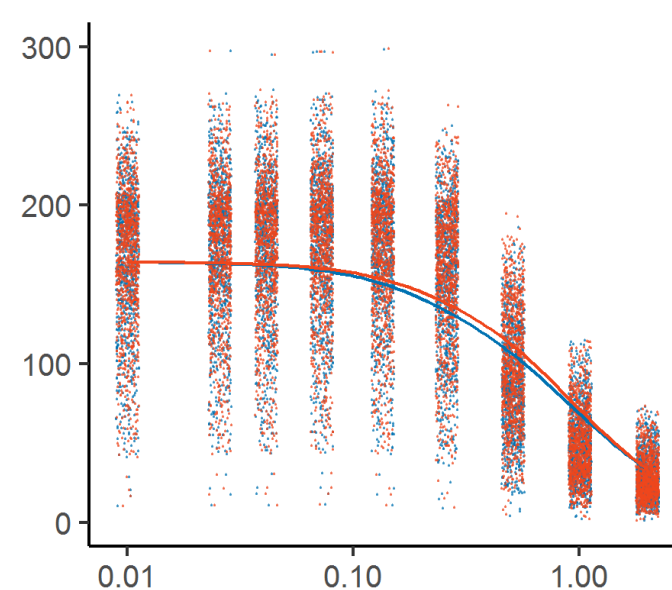
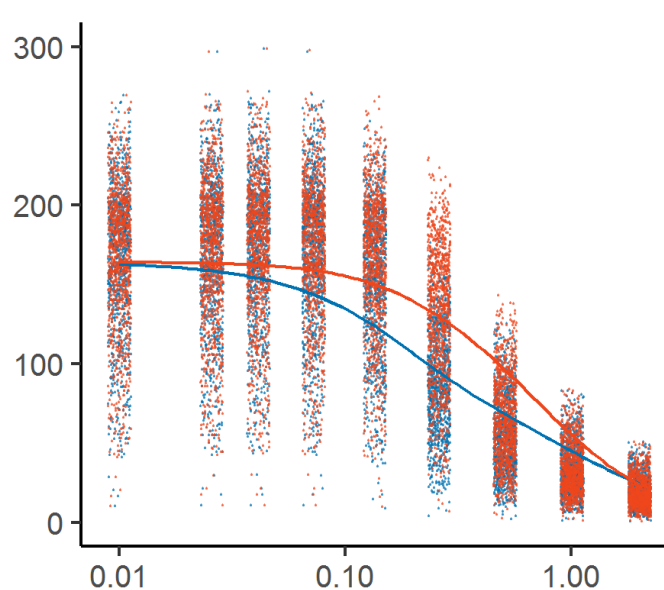
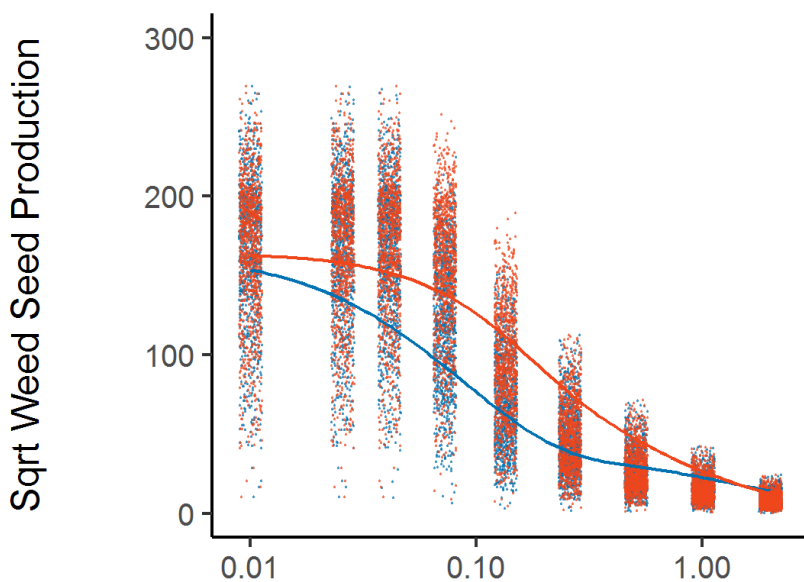
Medium SOM

High SOM

# MODELLING



No Crop Competition



Crop Competition

Dose + 0.01

Low SOM

Dose + 0.01

Medium SOM

Dose + 0.01

High SOM

## ED50s



<b>Soil Organic Matter</b>	<b>Herbicide</b>	<b>Seedling Biomass</b>	<b>Weed Seed Production</b>
Low	Flufenacet	0.0711	0.1226
	Pendimethalin	0.1238	0.1577
Medium	Flufenacet	0.1997	0.3330
	Pendimethalin	0.3932	0.4465
High	Flufenacet	0.4374	0.6168
	Pendimethalin	0.5137	0.6611



# Modelling the spatial and temporal variation in *Alopecurus myosuroides* for precision weed management

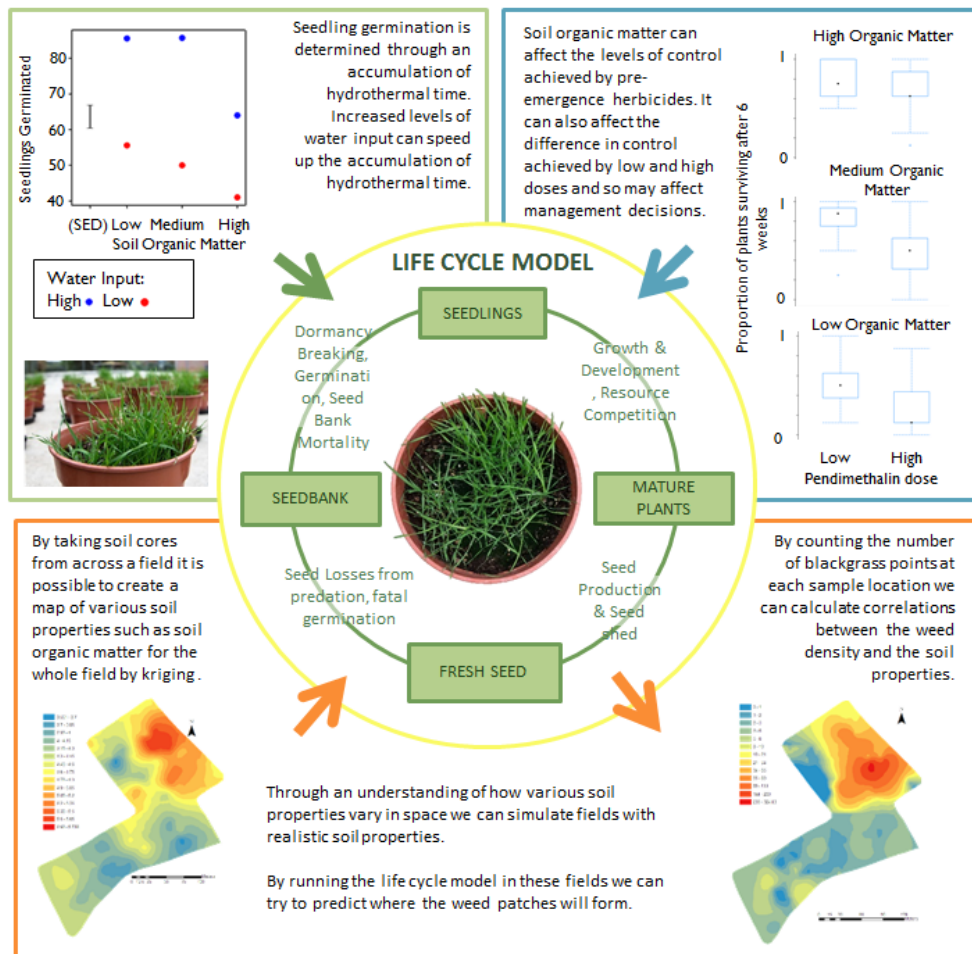


ROTHAMSTED RESEARCH

H Metcalfe<sup>a,b</sup>, AE Milne<sup>a</sup>, A Murdoch<sup>b</sup>, J Storkey<sup>a</sup>

<sup>a</sup>Rothamsted Research, Harpenden, UK, <sup>b</sup>University of Reading, UK

Many aspects of the life cycle of *Alopecurus myosuroides* can be affected by environmental conditions, in particular soil properties. By investigating how different soil conditions affect various aspects of the life cycle, I aim to understand why patches occur in particular areas of fields and if we can predict those patch locations to help inform precision management techniques such as patch spraying.



If we can identify areas of the field that are vulnerable to *Alopecurus myosuroides* establishment using soil maps alone then farmers may be able to use their existing soil maps to inform their decisions and build an integrated weed management program incorporating patch spraying.

Some of the work presented here is available in:

Metcalfe et al, 2015. Designing a sampling scheme to reveal correlations between weeds and soil properties at multiple spatial scales. *Weed Research* 56 (1) 1-15

