

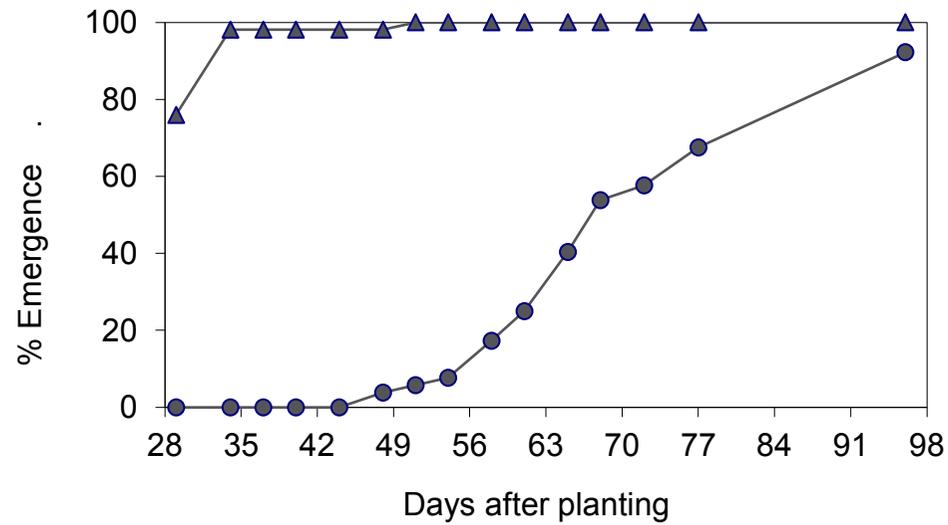
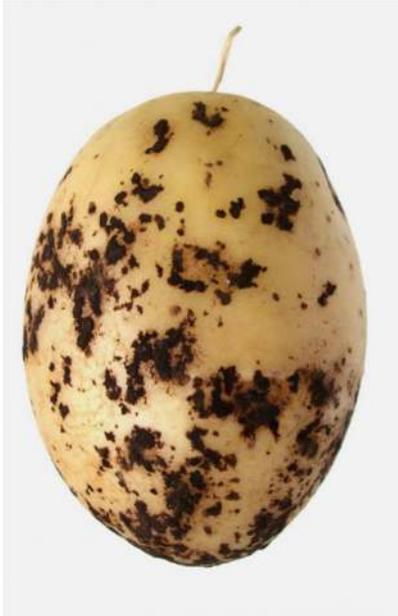


Does soil organic matter affect severity of disease on potato caused by *Rhizoctonia solani* ?

Jennie Brierley & Alison Lees



# *Rhizoctonia solani* AG3



# Evaluating disease risk



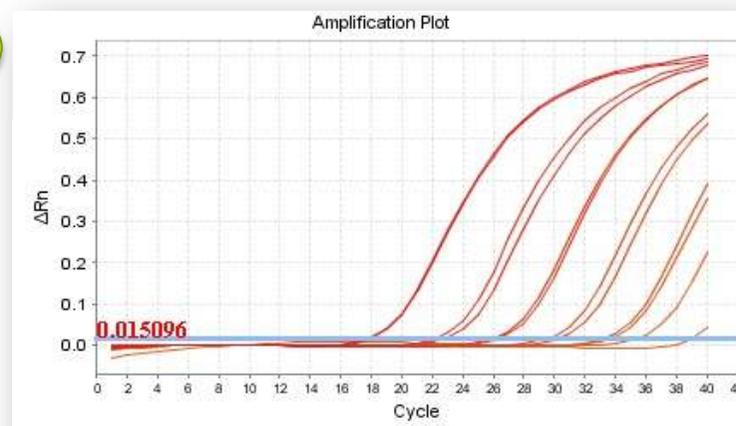
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1



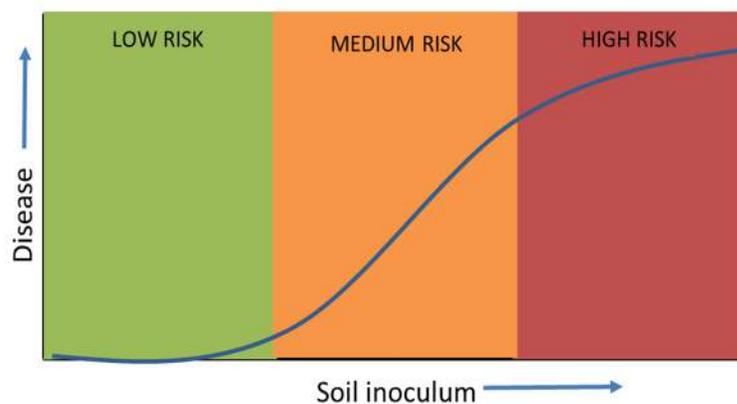
Soil sample (pre-planting)

2



Quantification of target inoculum

3

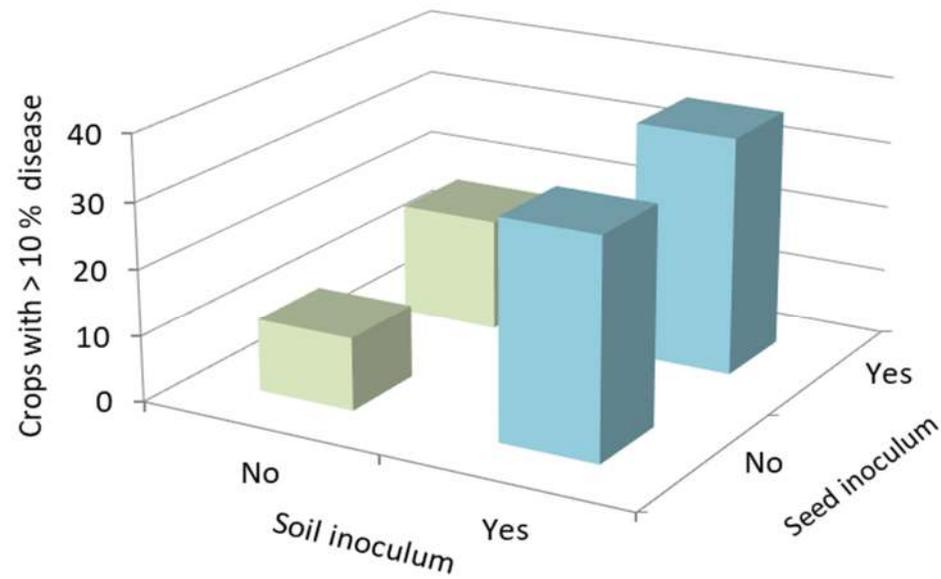
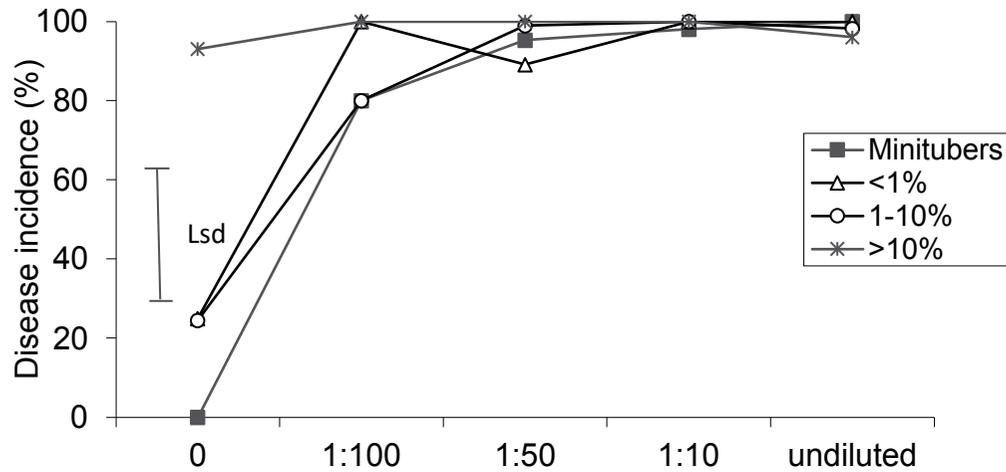


Relating inoculum to  
disease risk

# *R.solani* : black scurf



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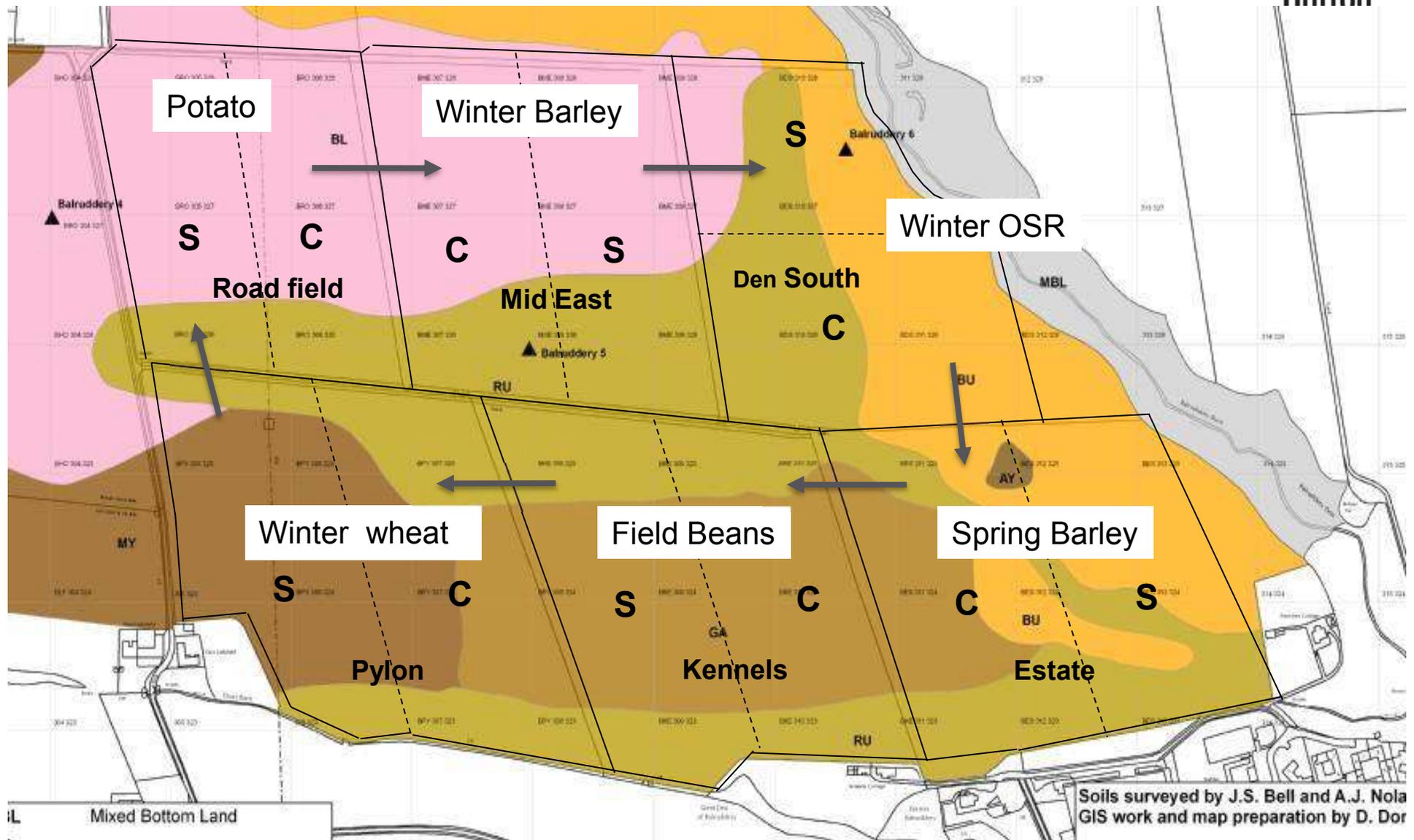


Brierley *et al.* (2016) Potato Research

# Farm scale monitoring: Centre for sustainable cropping platform



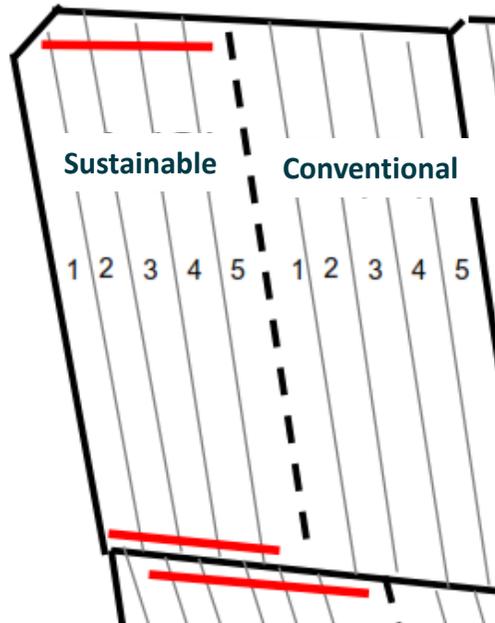
# Rotation & field layout



# Crop cultivars and treatments



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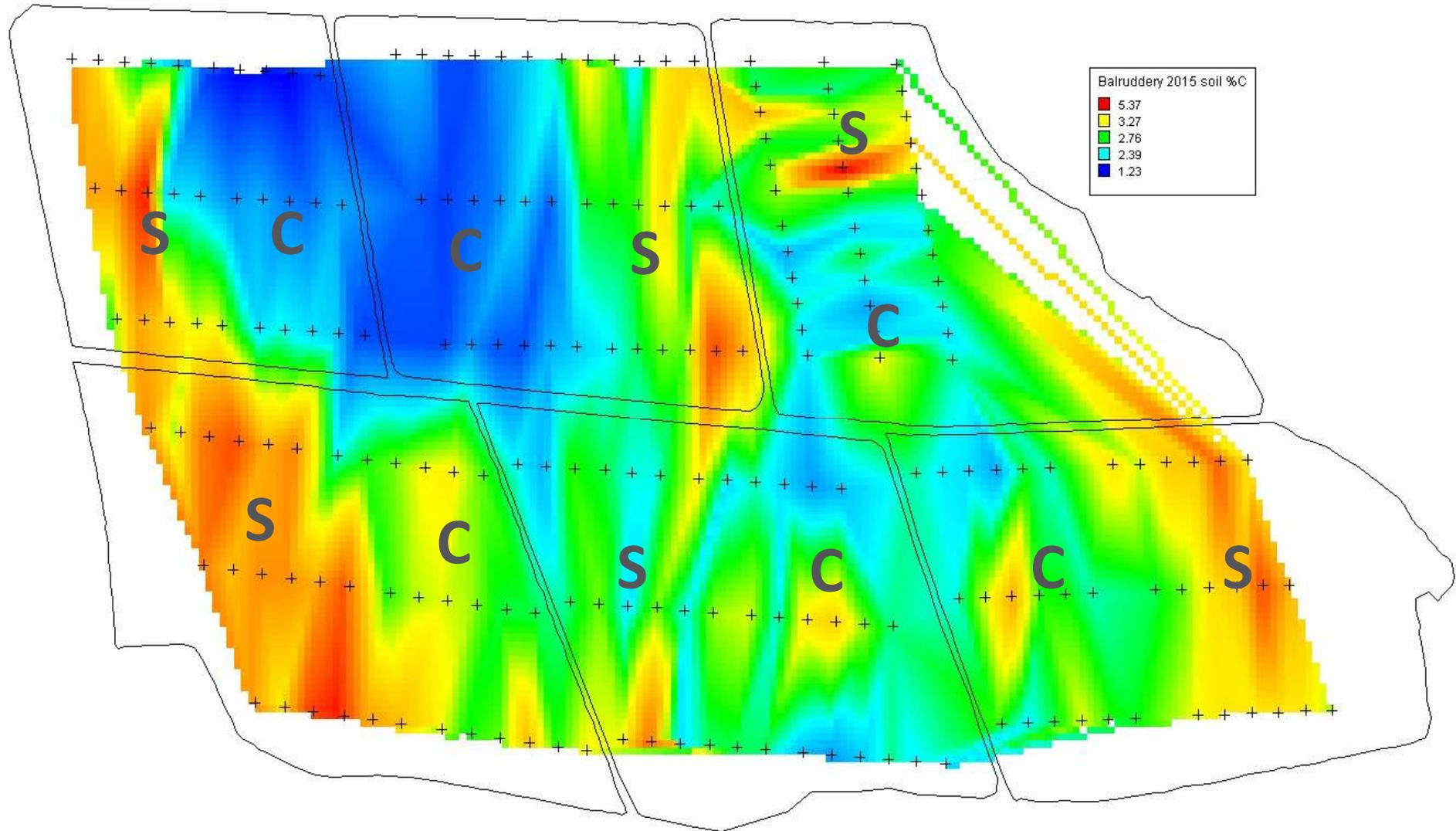
1. Lady Balfour
2. Mayan Gold
3. Vales Sovereign
4. Cabaret
5. Maris Piper

## Sustainable treatments:-

- Addition of compost
- Reduced inorganic fertilizer
- Reduced herbicide application
- Reduced fungicide/pesticide application



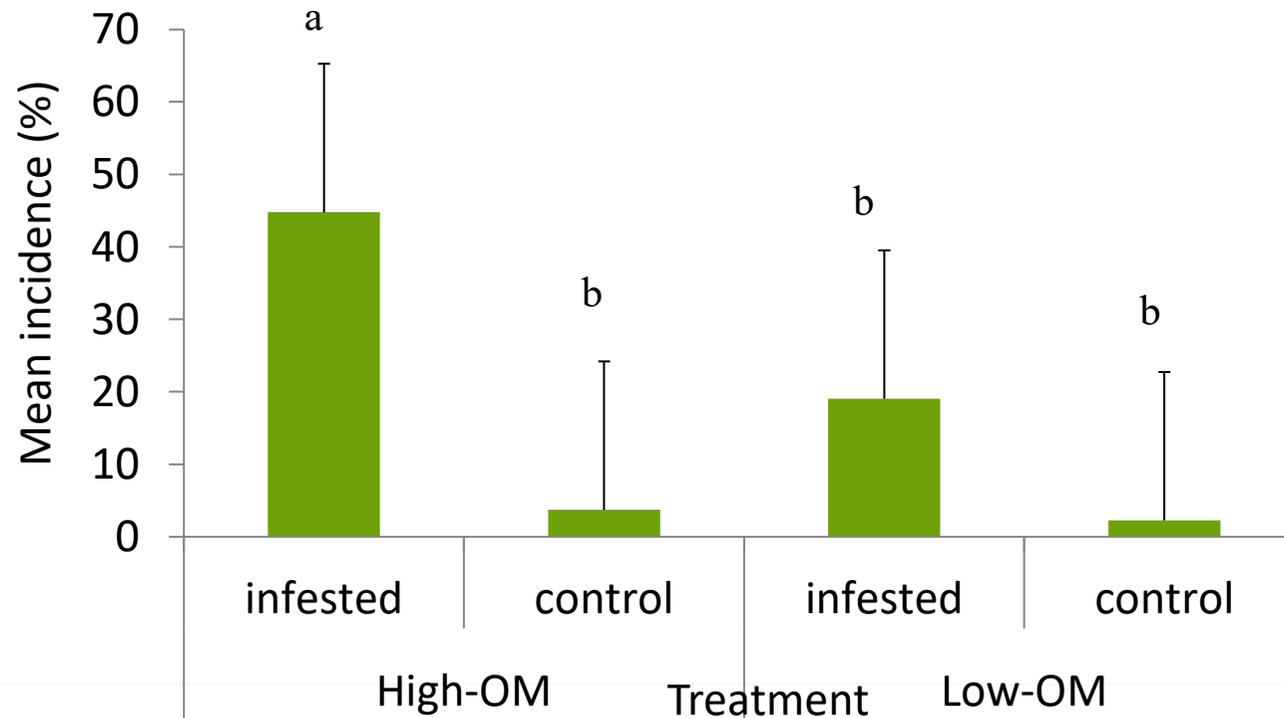
# Soil organic matter (2015)



# Black scurf on seed and progeny tubers

Black scurf (%) on seed stocks and progeny tubers grown in both conventional and sustainable treatments													
Cultivar	Agronomy	2011		2012		2013		2014		2015		2016	
		seed	progeny										
Cabaret	Conv.	28	46	0	0	0	0	0	0	8	0	13	0
	Sust.		13		0		0		0		13		0
Lady Balfour	Conv.	1	7	4	0	4	0	0	0	9	0	0	0
	Sust.		9		2		0		0		23		1
Maris Piper	Conv.	0	12	0	0	0	0	0	0	1	0	0	0
	Sust.		0		0		0		0		0		0
Mayan Gold	Conv.	0	0	0	0	0	0	0	0	9	0	12	0
	Sust.		0		0		0		0		22		2
Vales sovereign	Conv.	7	2	0	0	13	0	11	1	0	0	0	1
	Sust.		5		0		11		0		1		0

# Effect of increased soil organic matter: field trial



- plant emergence was delayed
- stolon pruning increased
- yield decreased
- black scurf on progeny tubers increased

# Effect of increased soil organic matter: Potting mixes



Environment?  
Isolates?  
Variety?

Potting mixes comprised of varying ratios of field soil and either manure or municipal compost were inoculated with *R. solani* AG3 and planted with a single Maris Piper mini-tuber. Plants were grown to maturity, and disease on progeny tubers was assessed visually.

Field soil 100%

Field soil 75% - Manure 25%

Field soil 50% - Manure 50%

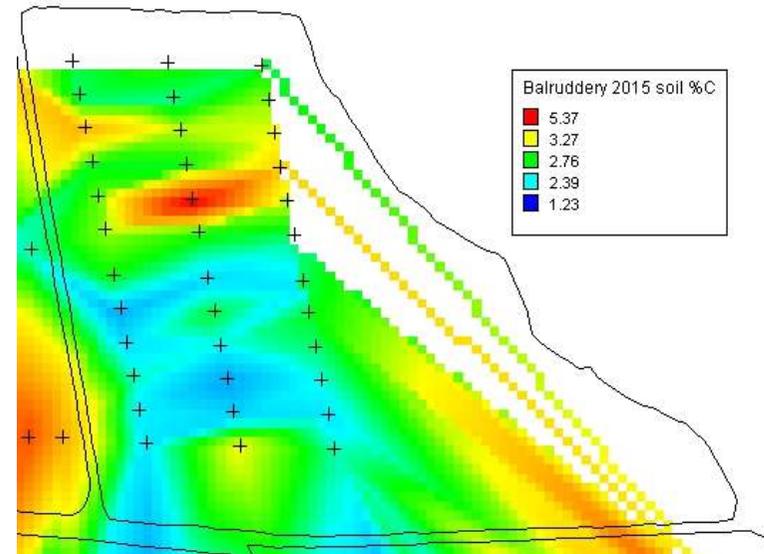
Field soil 25% - Manure 75%

Field soil 75% - Compost 25%

Field soil 50% - Compost 50%

Field soil 25% - Compost 75%

# Effect of increased soil organic matter: Comparing field soils



- 0 sclerotia added
- 0.01g sclerotia added per tuber
- 0.03g sclerotia added per tuber
- 0.06g sclerotia added per tuber

# Acknowledgements



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# Decision making

Site selection



Varietal selection



Crop management



Chemical control

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Crop protectants & Biopesticides



Biocontrol



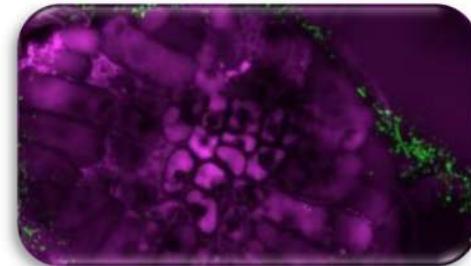
Biodiversity



Landscape Management



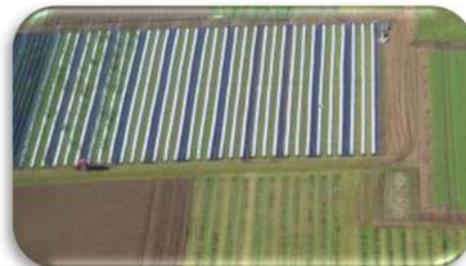
Pest & Disease Resistance



Detection & Monitoring



Pollinators



Rotations & Crop Diversity



Weed Management



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