



Department of
Primary Industries and
Regional Development

Protect
Grow
Innovate

How soil amelioration affect pre-emergent herbicide efficacy?

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Grains Industry Day





To assess the effectiveness of pre-emergent herbicides, deemed less toxic to the wheat crop, in controlling three specific weeds in ameliorated conditions.

Aims

- Asses the efficacy of pre-emergent herbicide treatments following soil amelioration.
- Investigate the impact of dry sowing conditions on the efficacy of pre-emergent herbicides.
- Evaluate weed population reduction under the influence of strategic deep tillage methods.



Experimental design

Field trials 2023: Dry (Wongan Hills) and wet sown (Merredin)

Design: Strip-plot design with four replications.

Plot size: 8 x 2 m

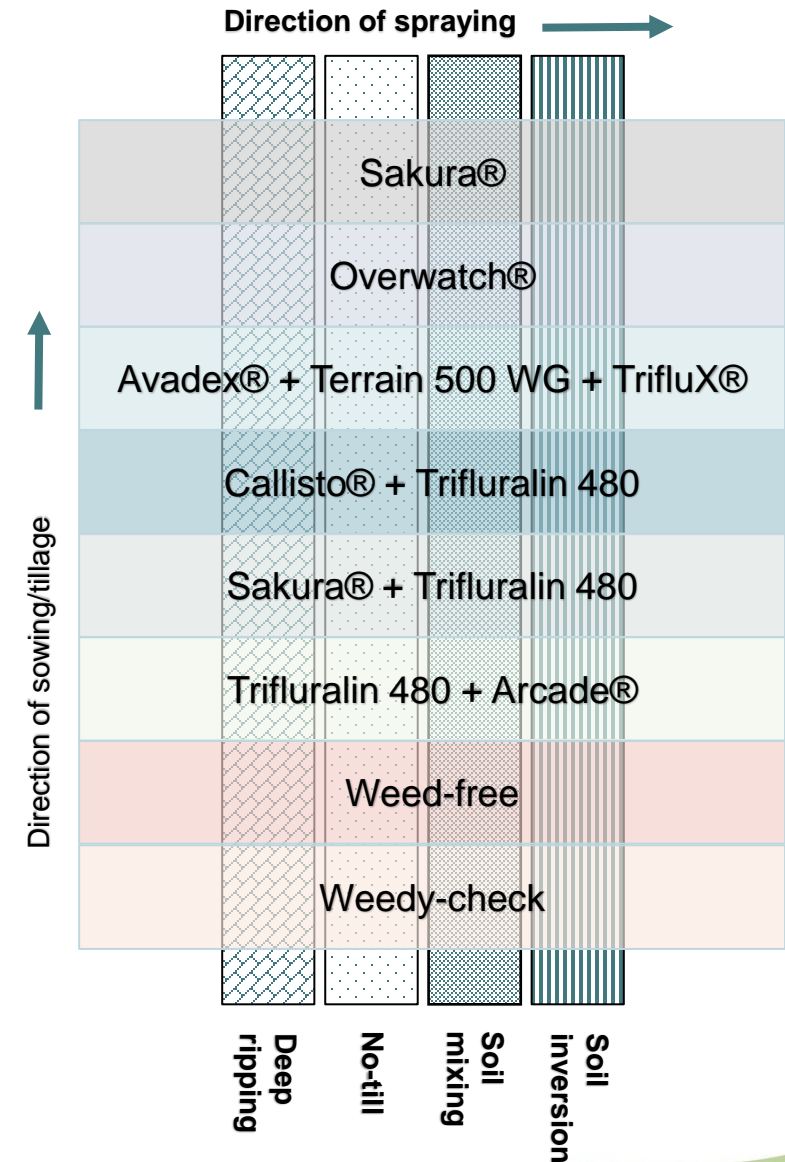
Wheat variety: Scepter

Deep tillage methods:

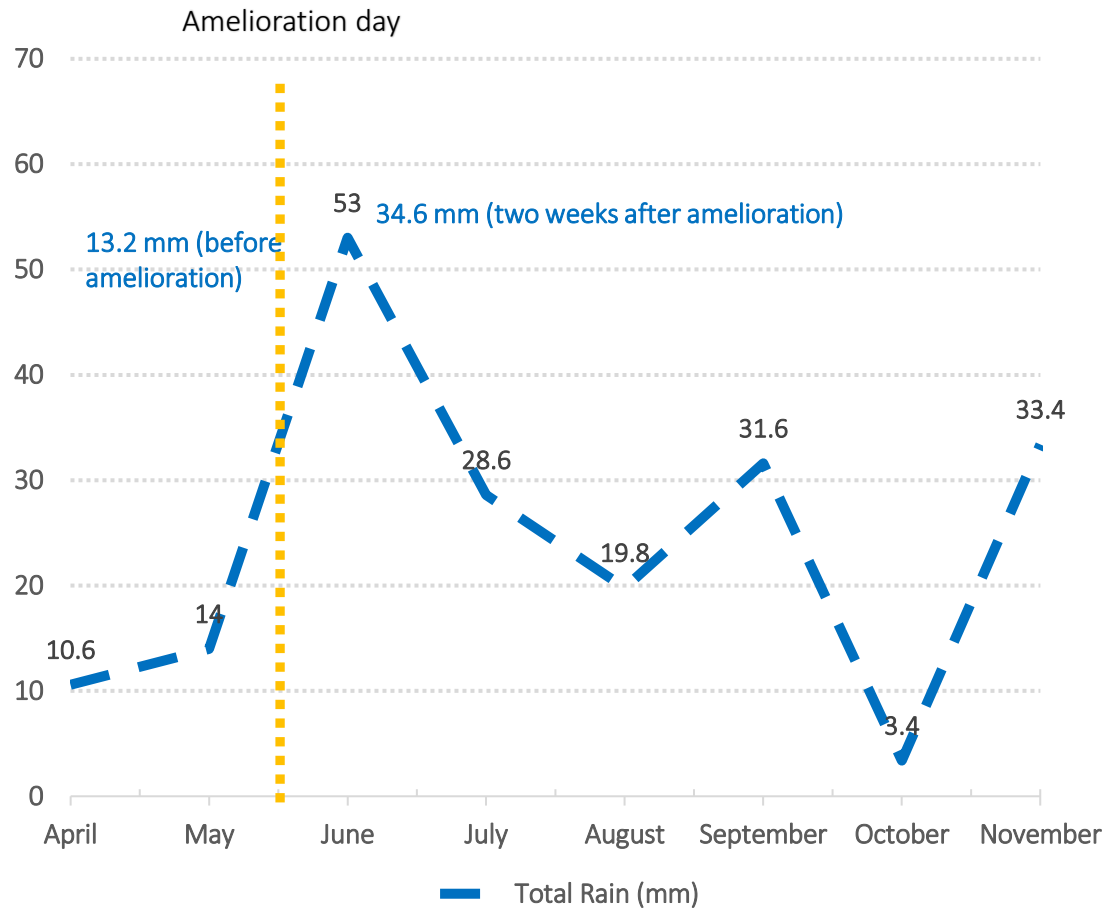
- Deep ripping
- Soil mixing
- Soil inversion
- No tillage

Herbicide treatment:

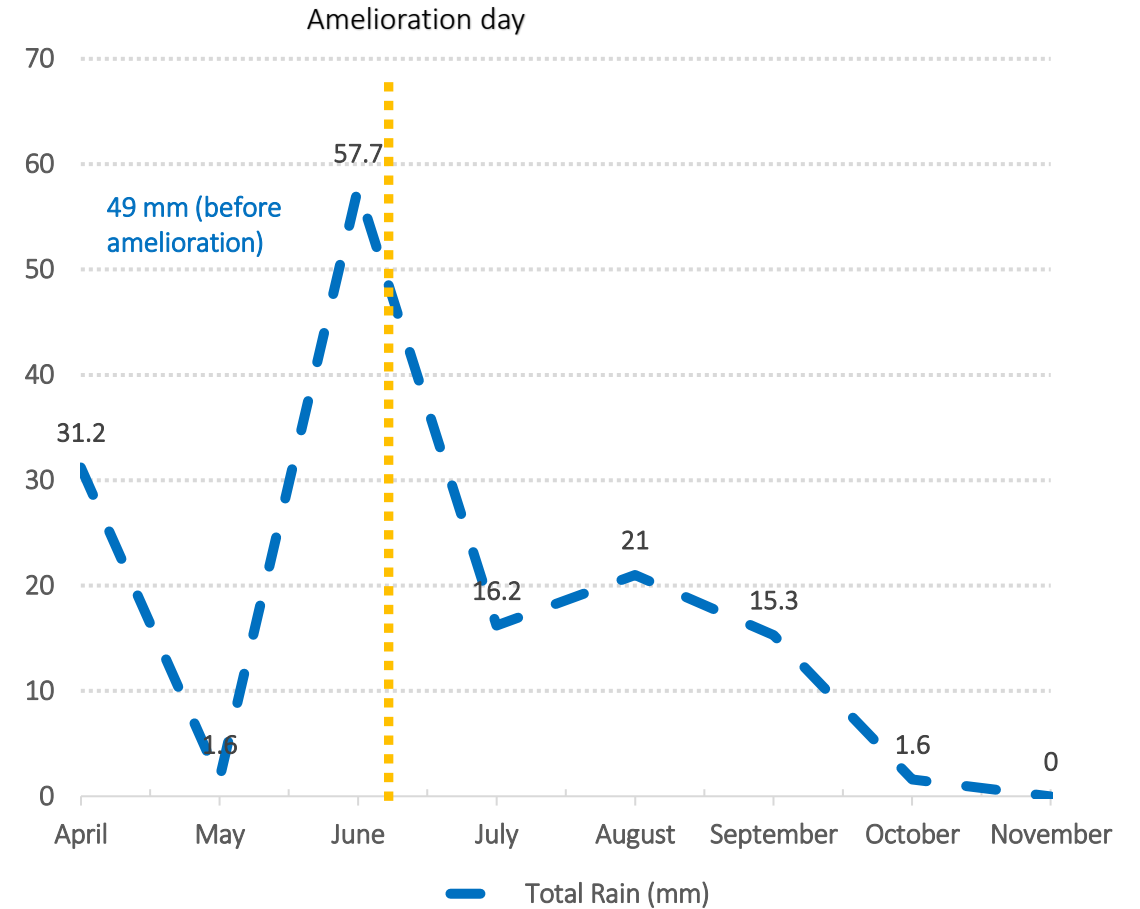
- Herbicide treatment: 6
- Weed-free
- Weedy-check



Pattern of rainfall (mm)



WONGAN HILLS



MERREDIN

Crop phytotoxicity [30 DAS]



Crop establishment

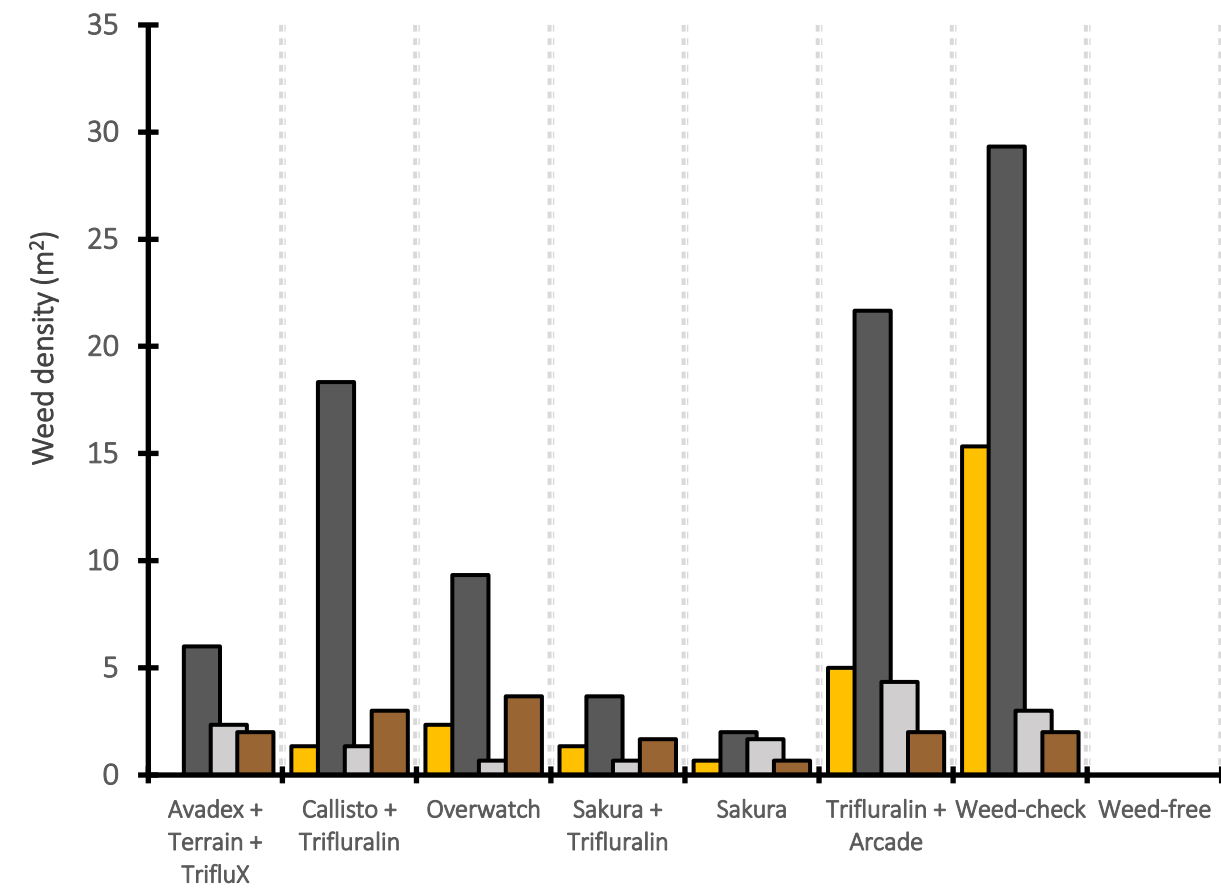
Deep ripping



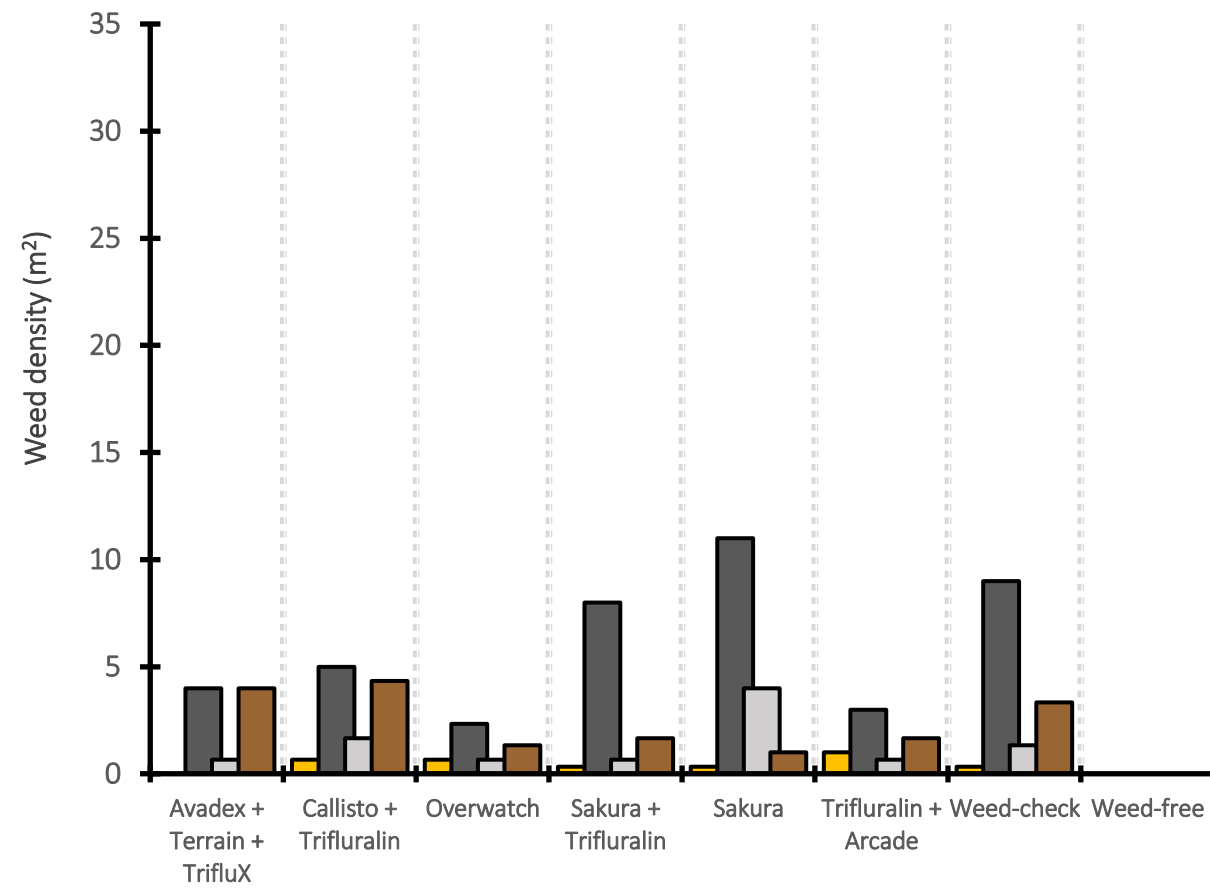
Soil inversion

Density of annual ryegrass [30 DAS]

■ No-till ■ Deep ripping ■ Spading ■ Soil inversion

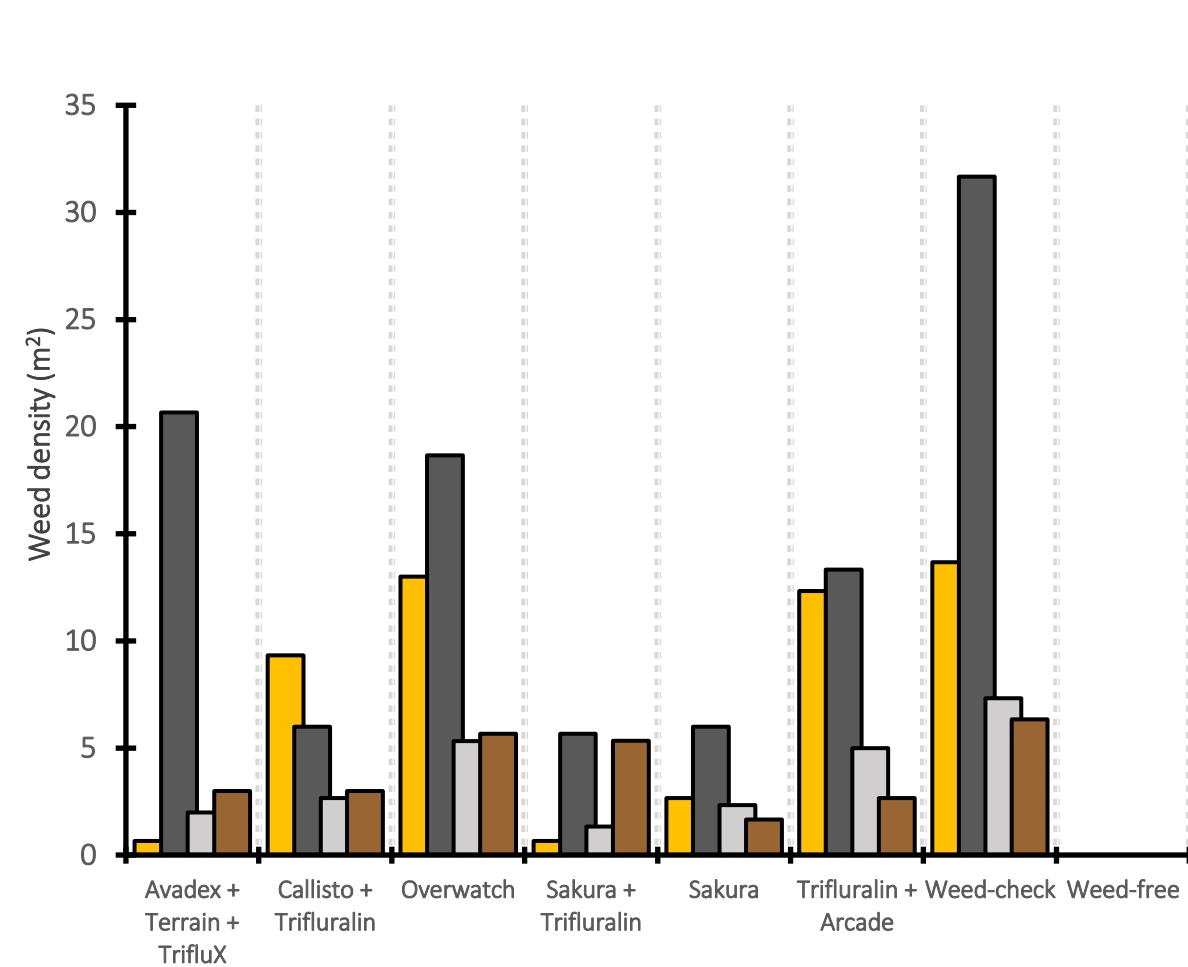


WONGAN HILLS

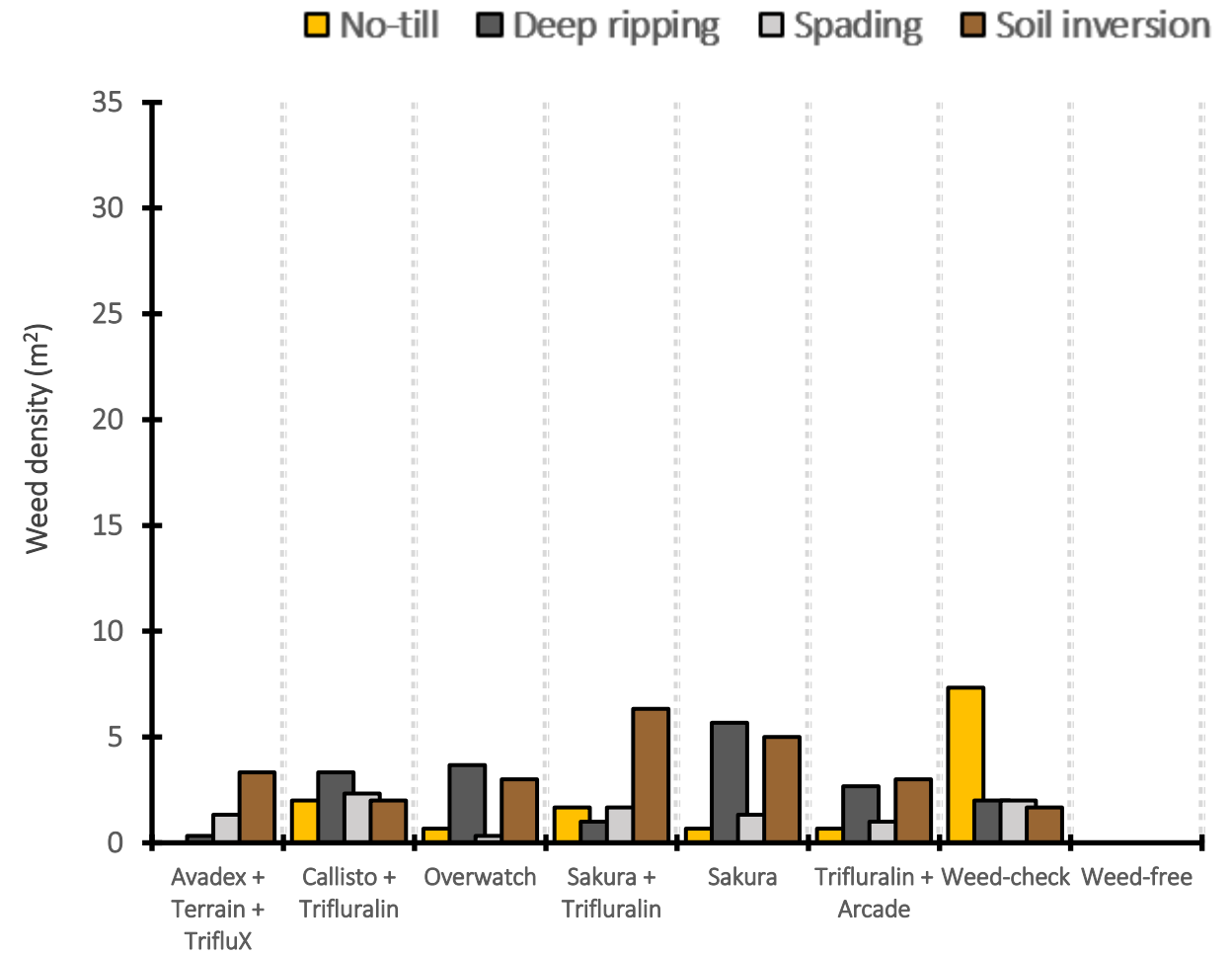


MERREDIN

Density of great brome [30 DAS]

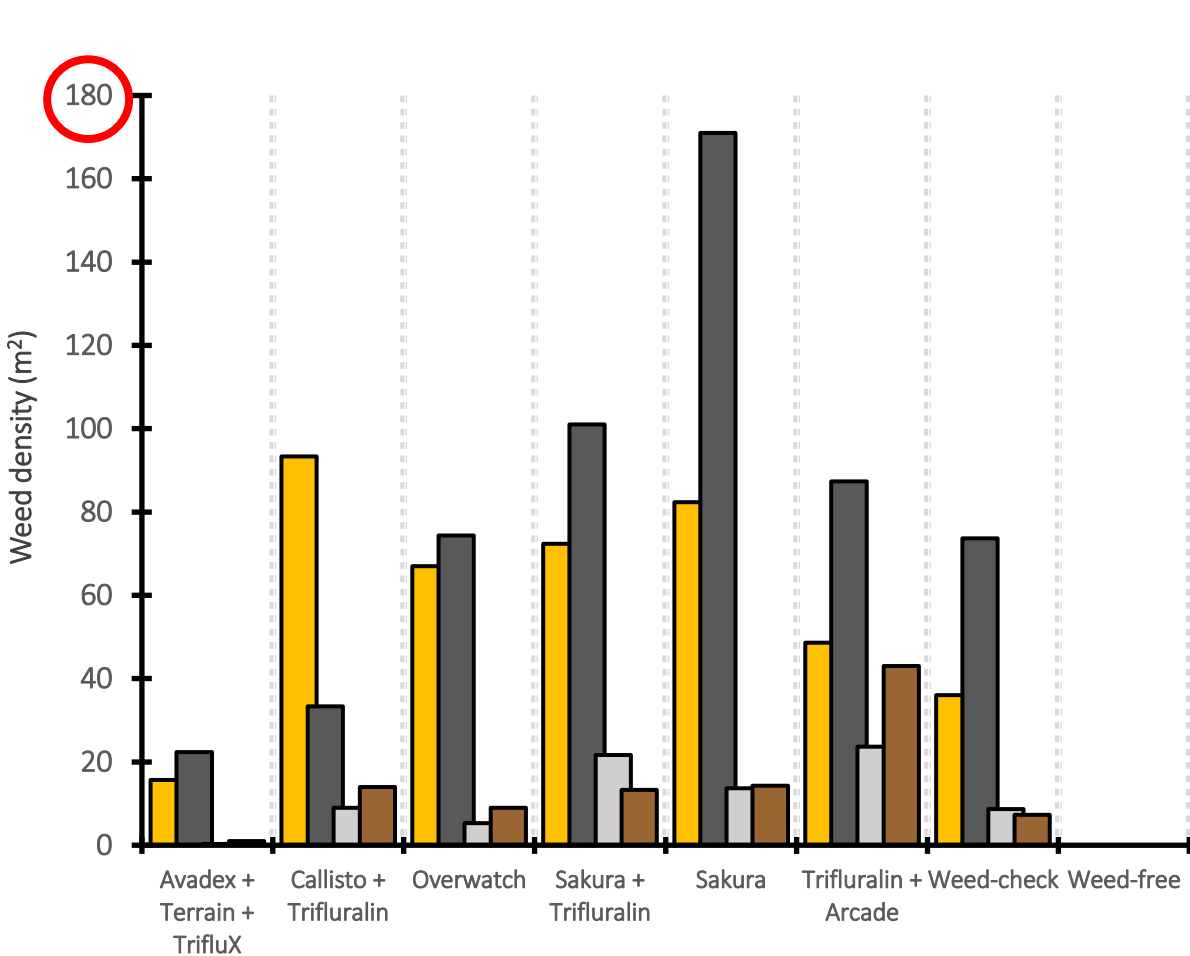


WONGAN HILLS

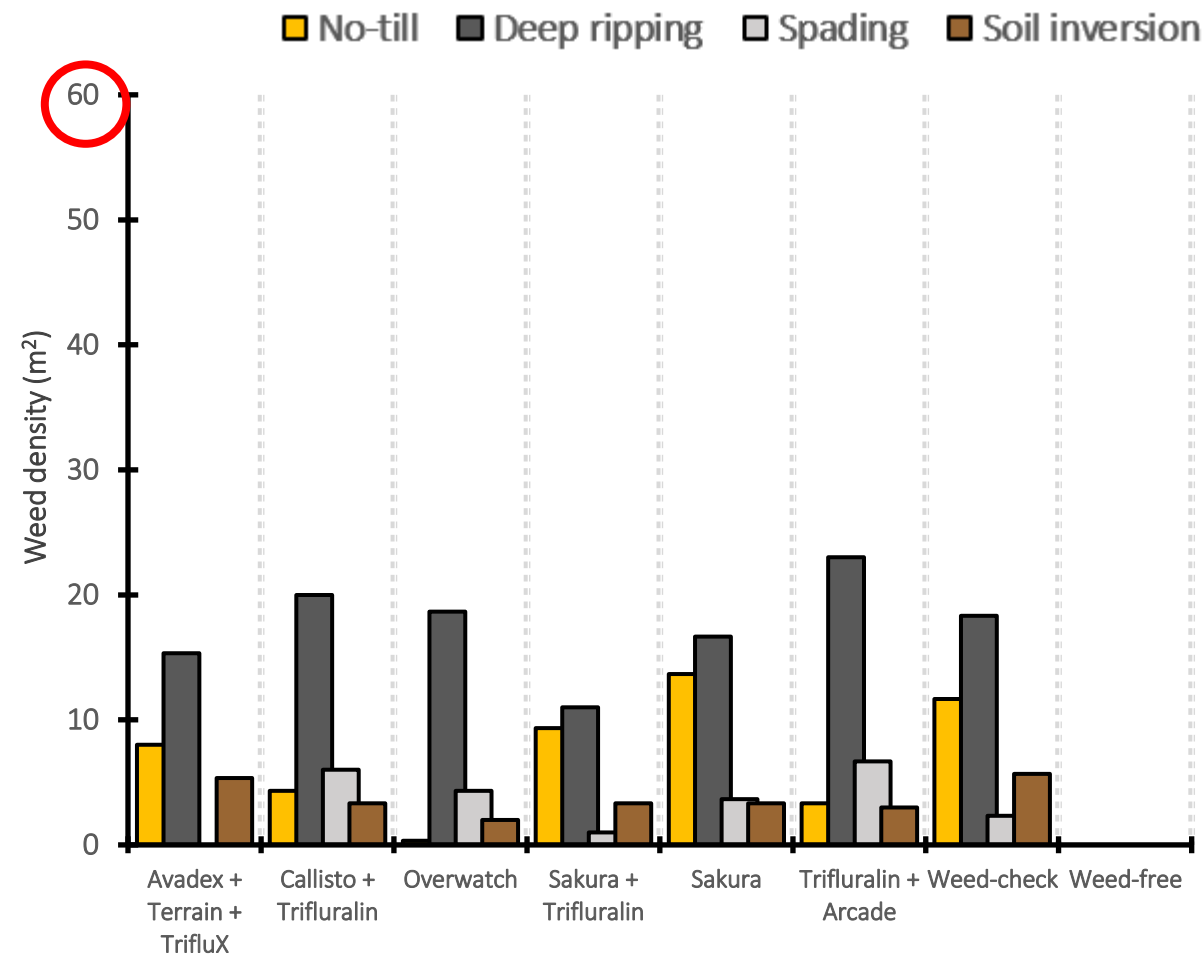


MERREDIN

Density of wild radish [30 DAS]

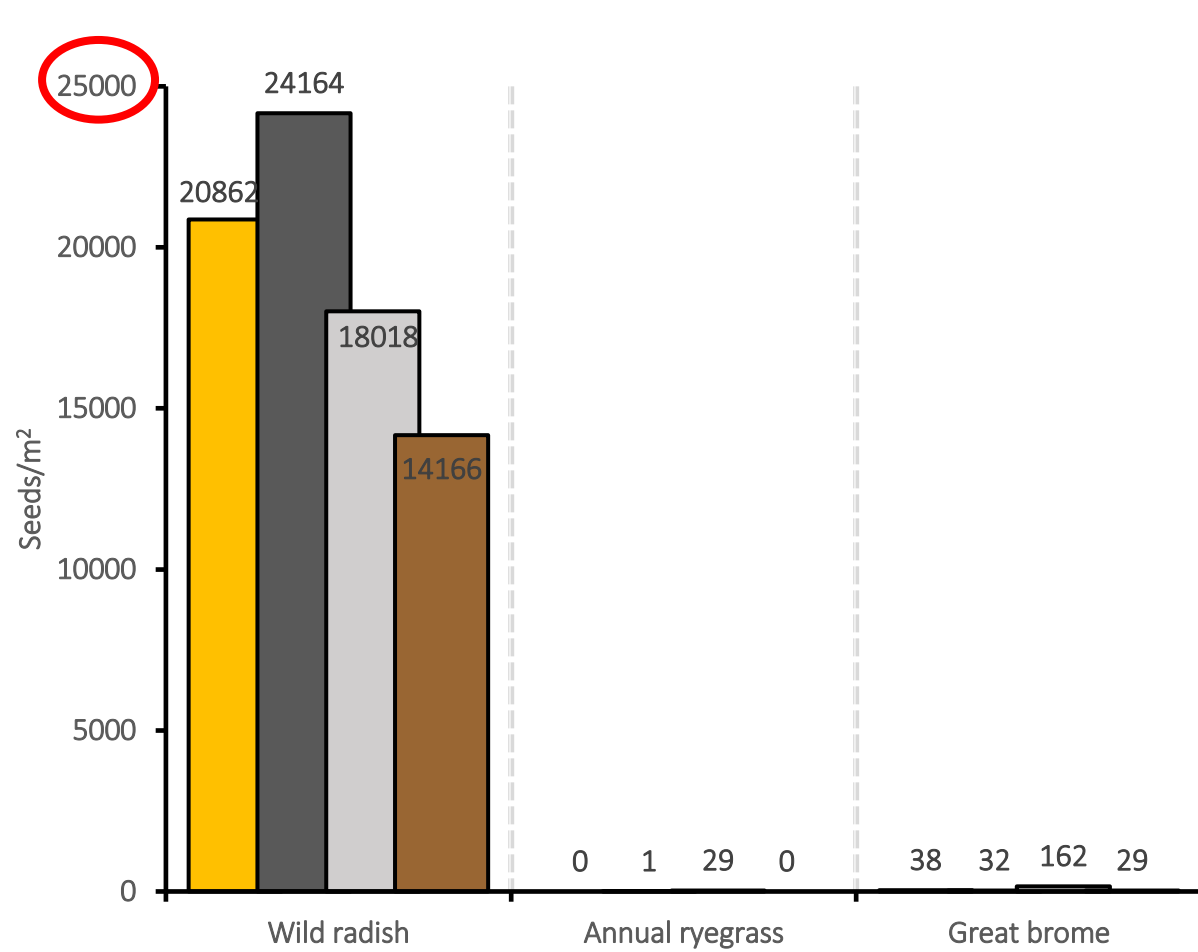


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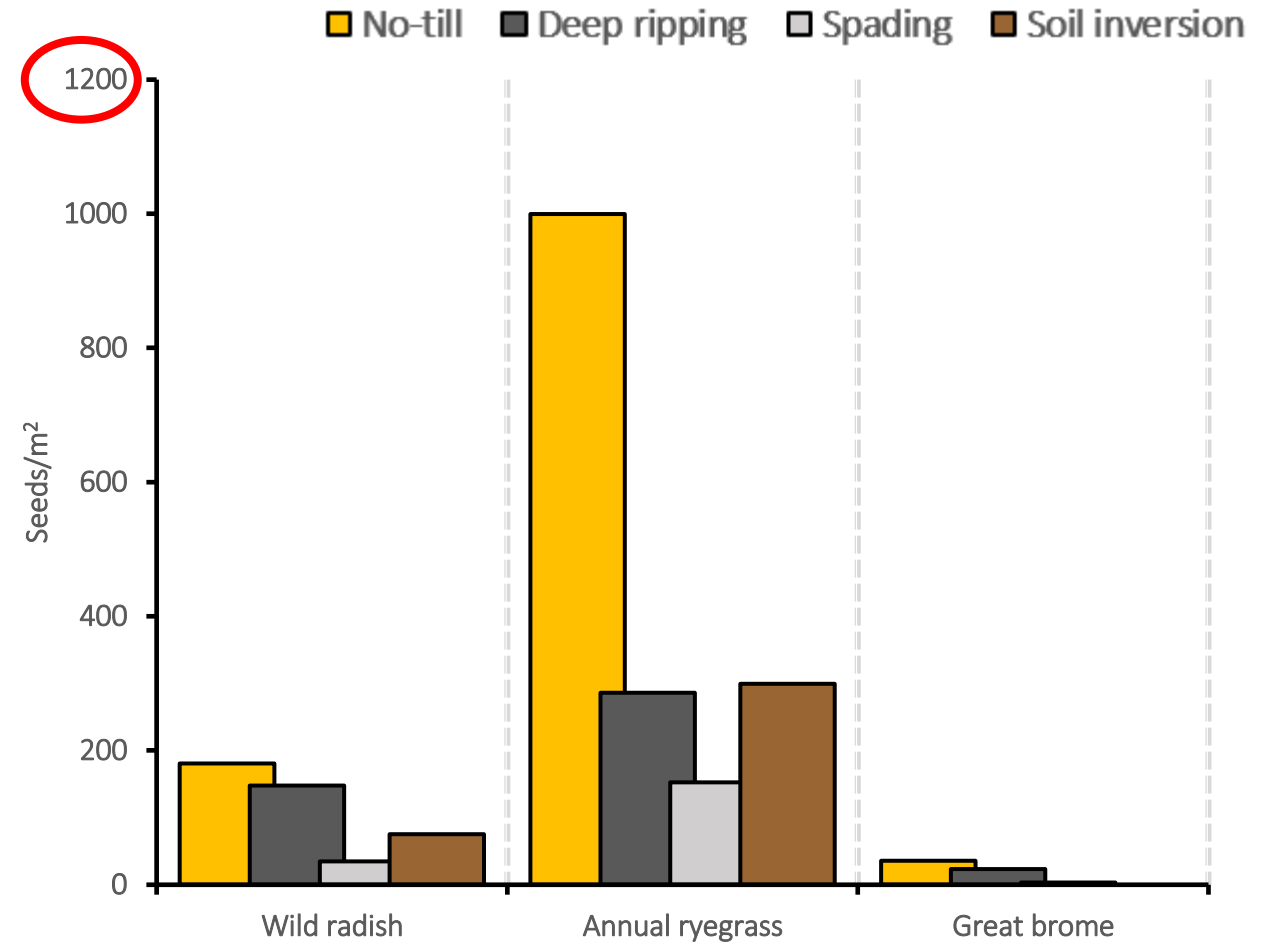


MERREDIN

Weed seed production [Harvest]

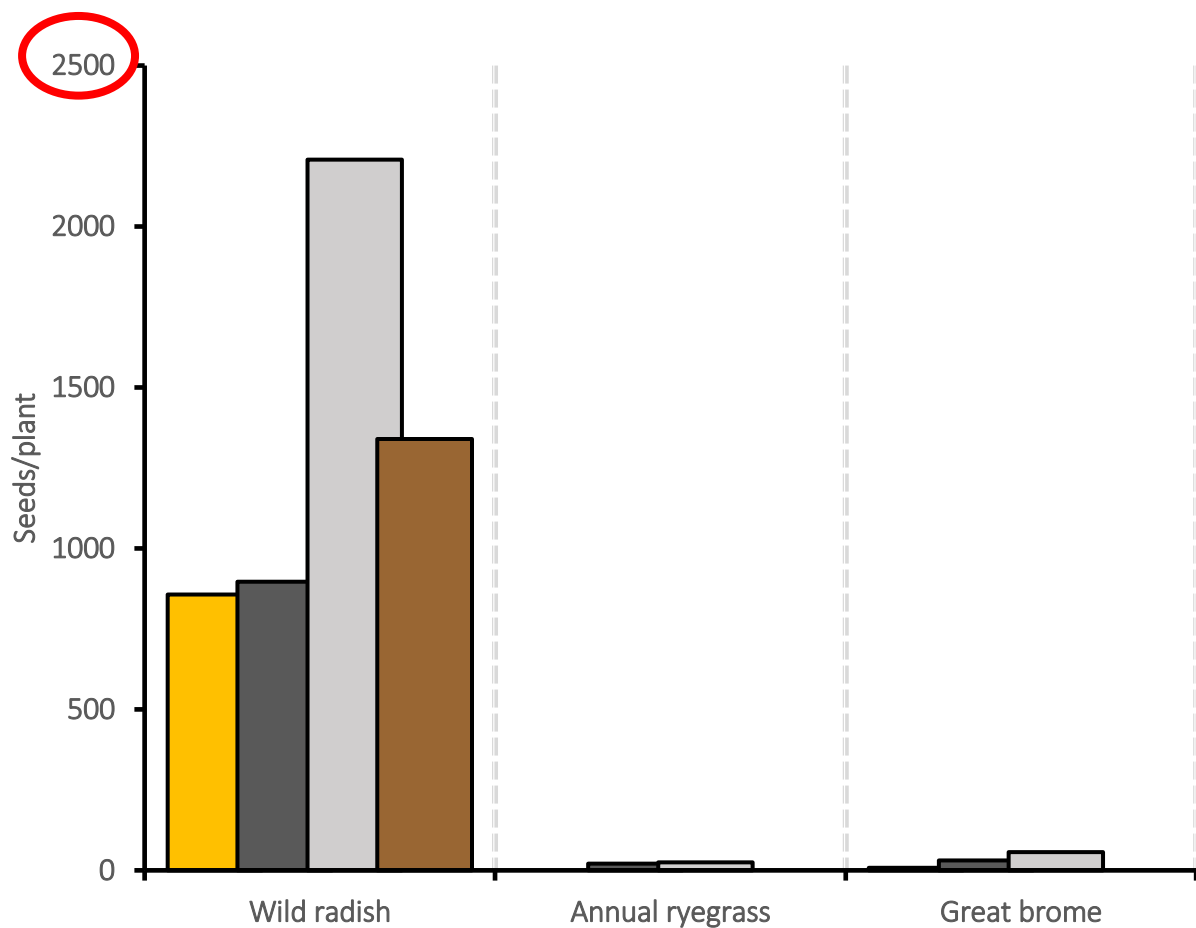


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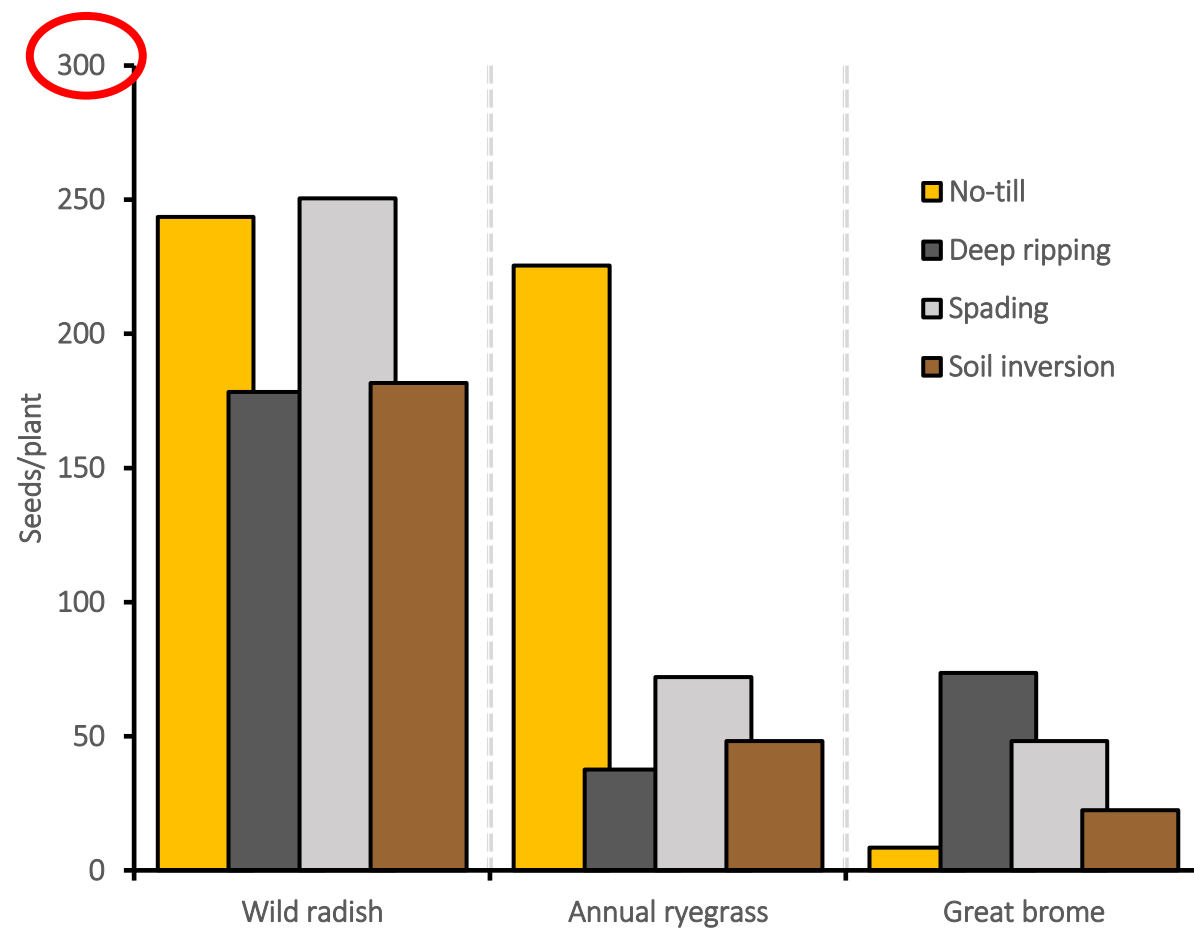


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Weed seed production [Harvest]

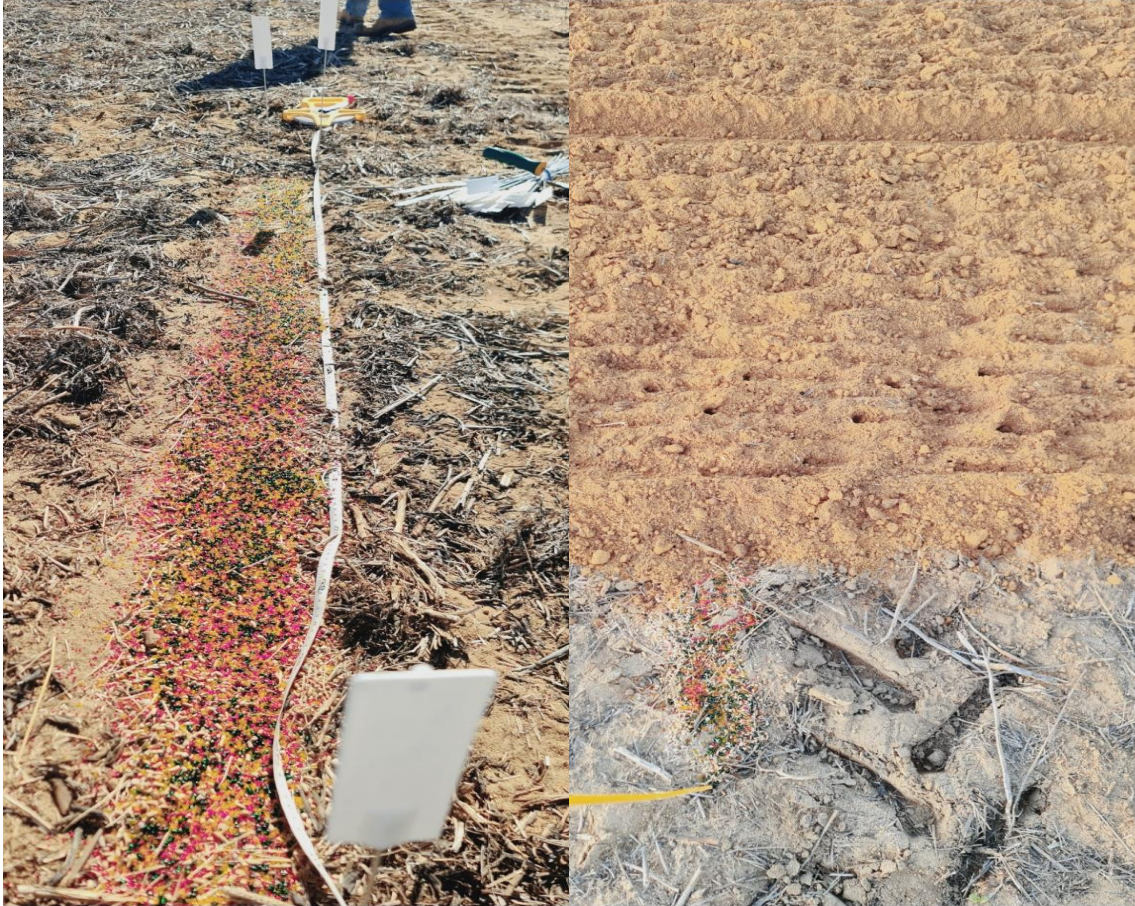


WONGAN HILLS

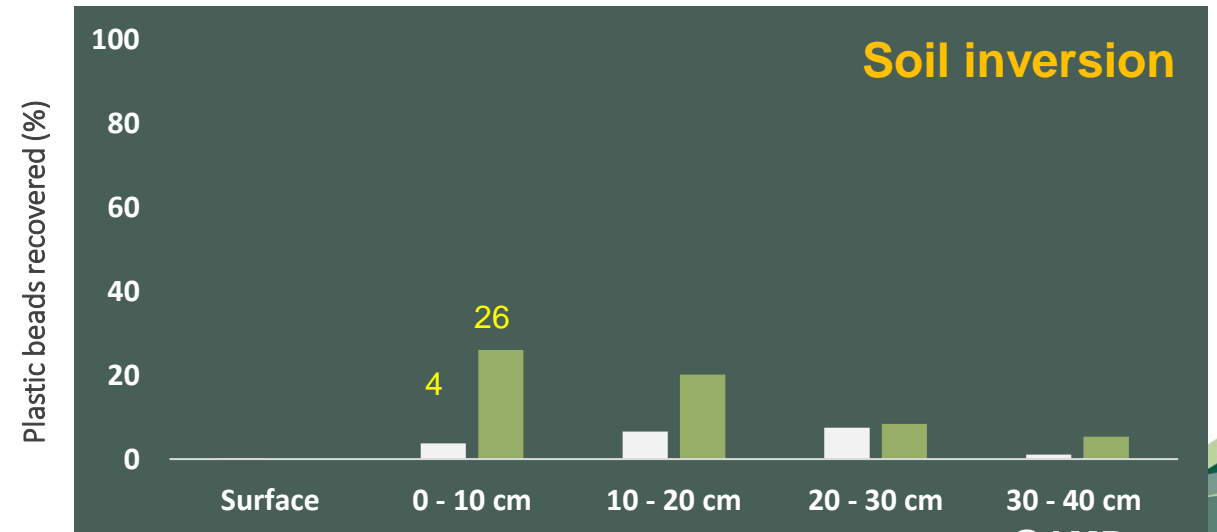
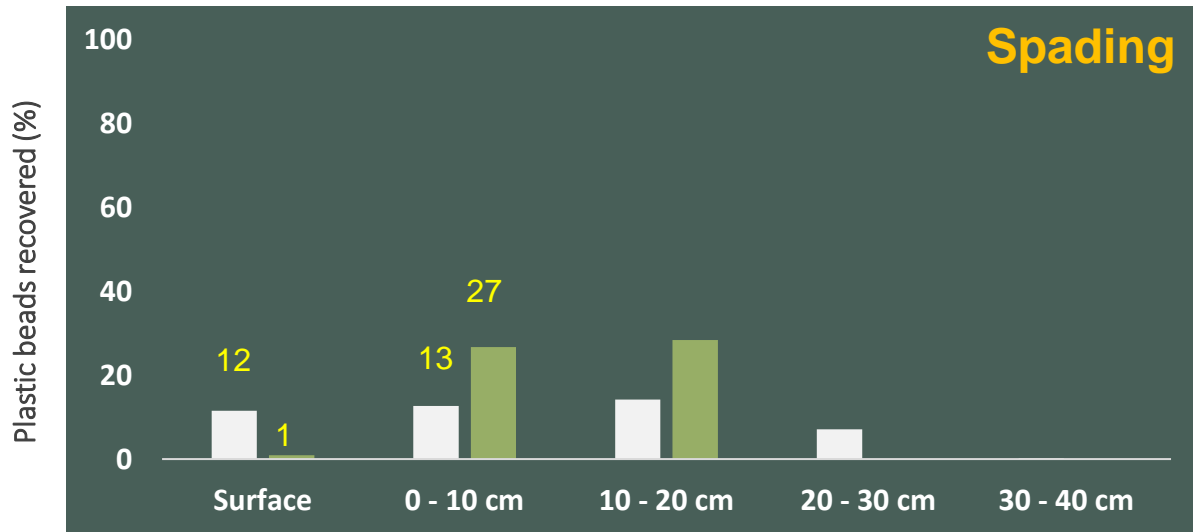
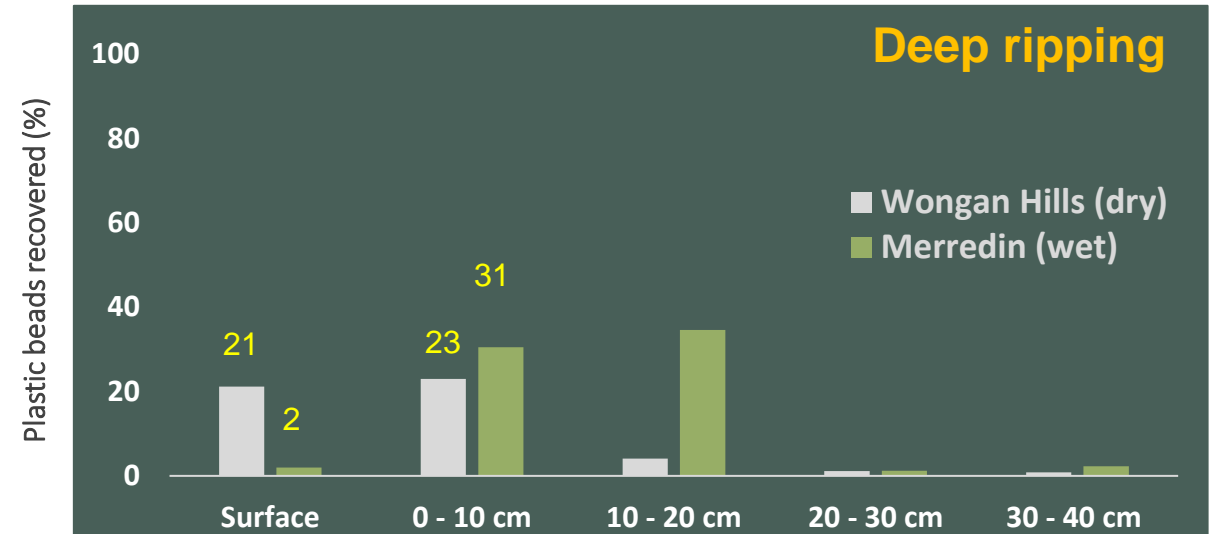
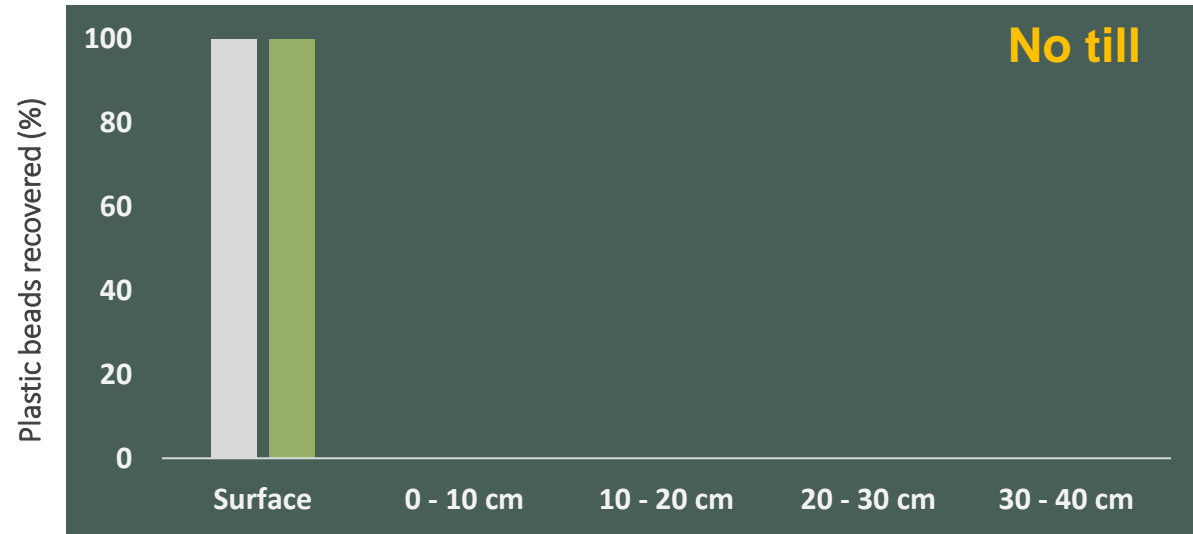


MERREDIN

Plastic beads recovery (%)



Plastic beads recovery (%)



Summary

- Weed population reduction following strategic deep tillage methods is field-specific.
- Dry sowing conditions and/or heavy rainfall event post amelioration can possibly compromise herbicide efficacy.
- Soil inversion and soil mixing can present challenges for crop establishment.
- Pre-emergent herbicide treatments did not suppress weed populations as expected.



Project: DAW1901_006RTX Increasing farming system profitability and longevity of benefits following soil amelioration



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Thank you

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