

Harvest weed seed control

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Why HWSC works

Weed species	Retained seed* (%)
<i>Lolium rigidum</i>	88
<i>Raphanus raphanistrum</i>	99
<i>Bromus</i> spp.	73
<i>Avena</i> spp.	85

* Seed above harvester cutting height (15cm)

HWSC systems



Chaff lining



Harrington Seed Destructor



Chaff cart



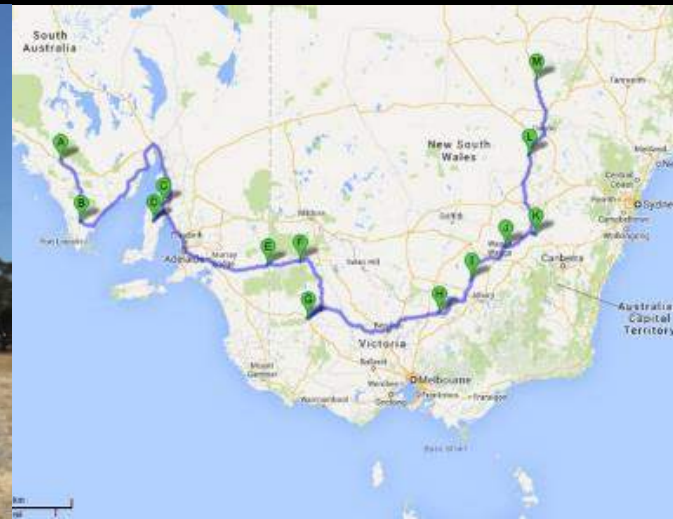
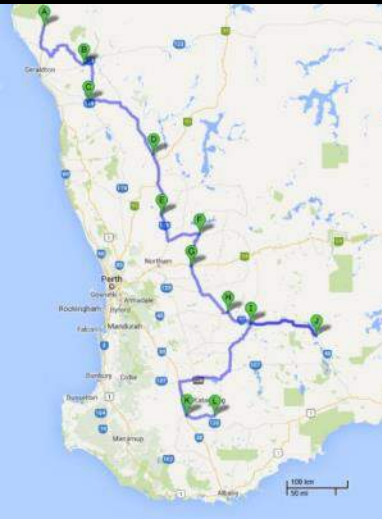
Bale Direct



Narrow windrow burning

Comparison of HWSC systems

Narrow Windrow Burning, Chaff Carts and HSD
at 25 sites across Australia



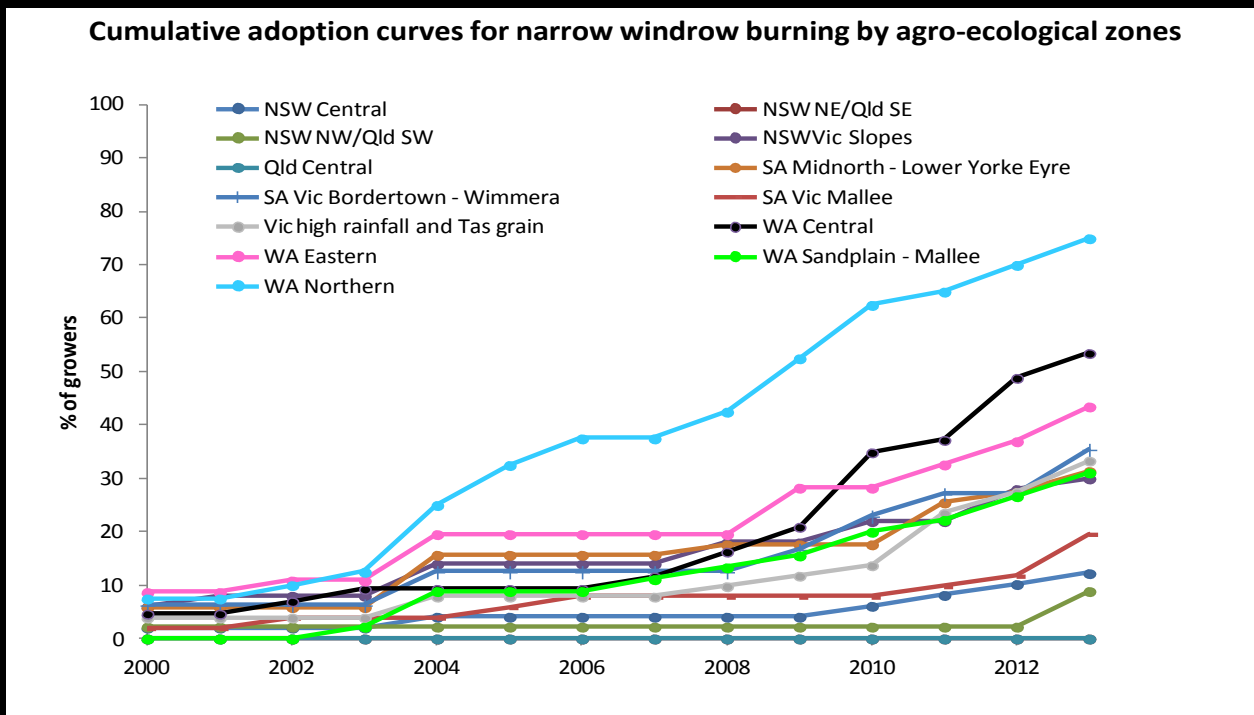
Lolium emergence in autumn

Treatment	Reduction in <i>Lolium</i> emergence (%)
HSD	57
Chaff cart	56
Narrow windrow burn	57
LSD (P=0.05)	9

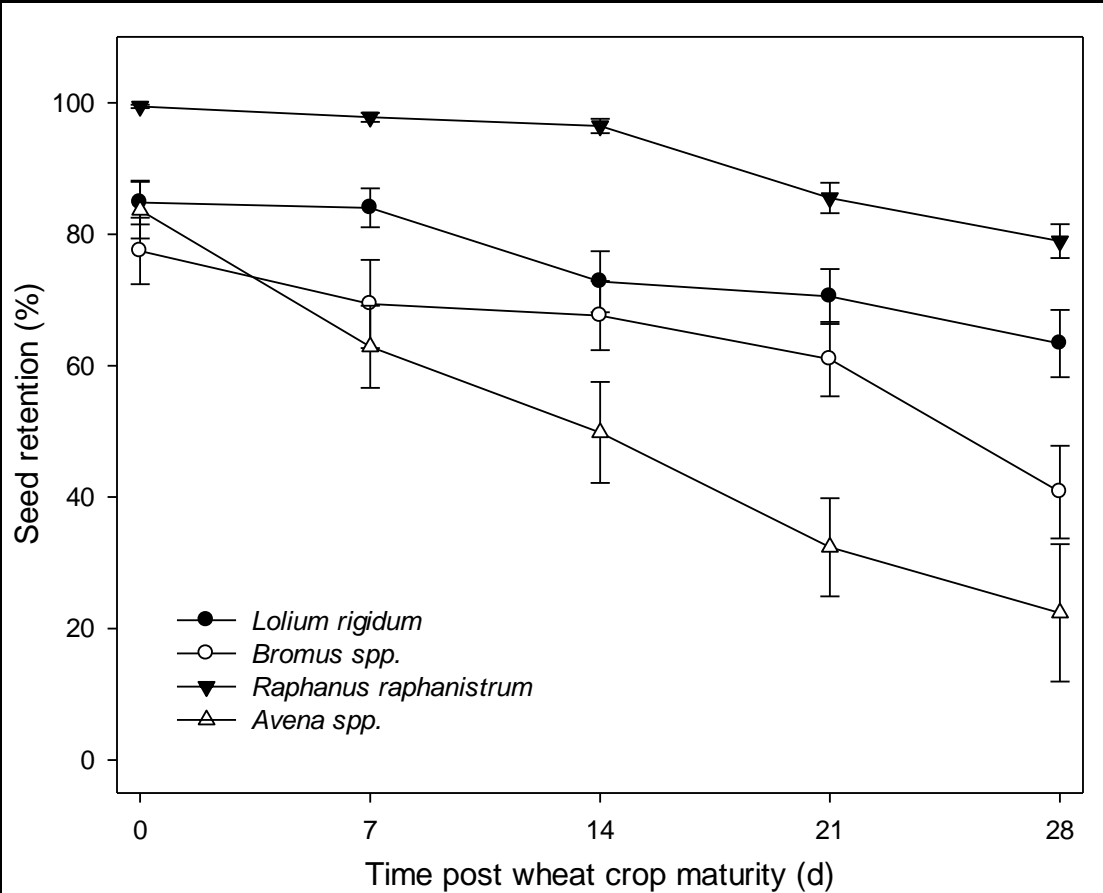
HWSC is an accepted practice

Adopted by approx. a third of crop producers

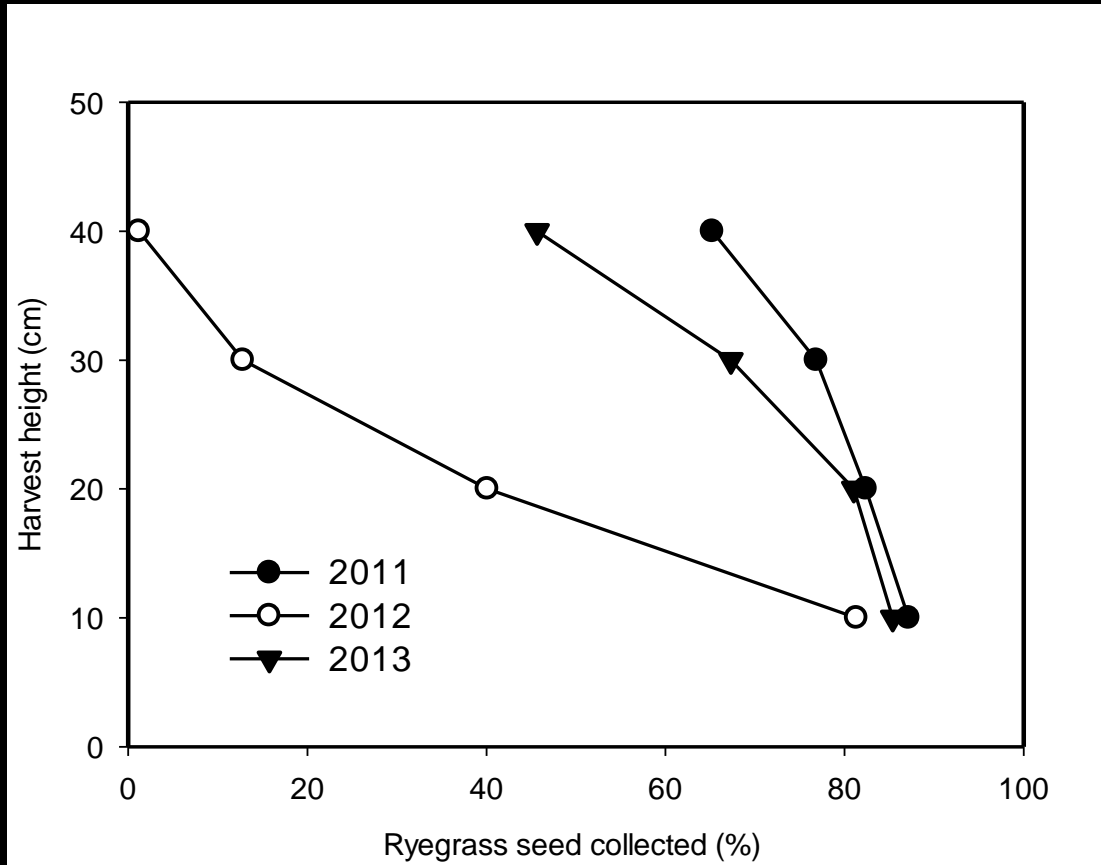
An Australian innovation



More to be done yet

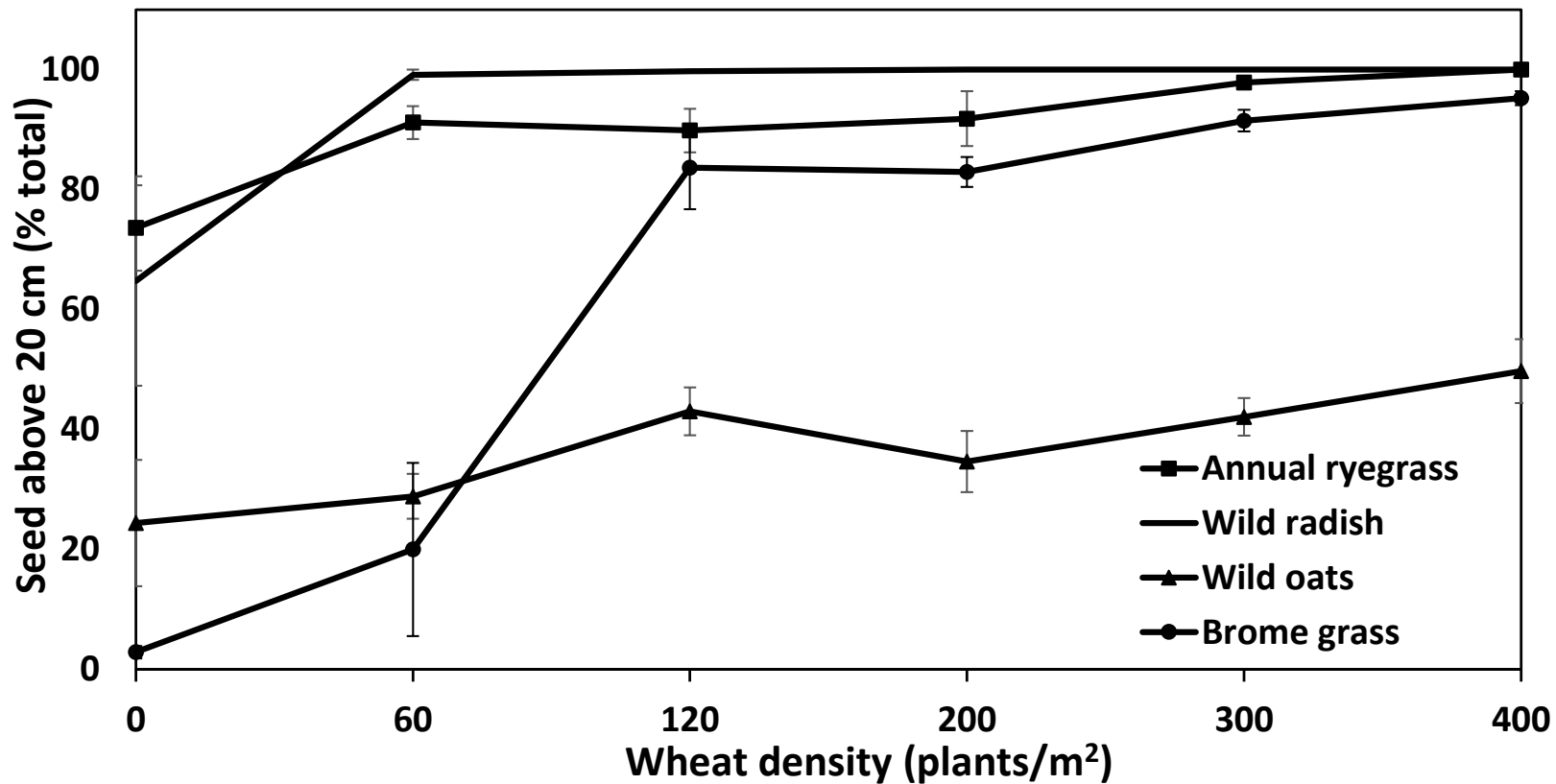


Increasing seed retention



Year	Yield (t/ha)
2011	4.0
2012	0.6
2013	3.0

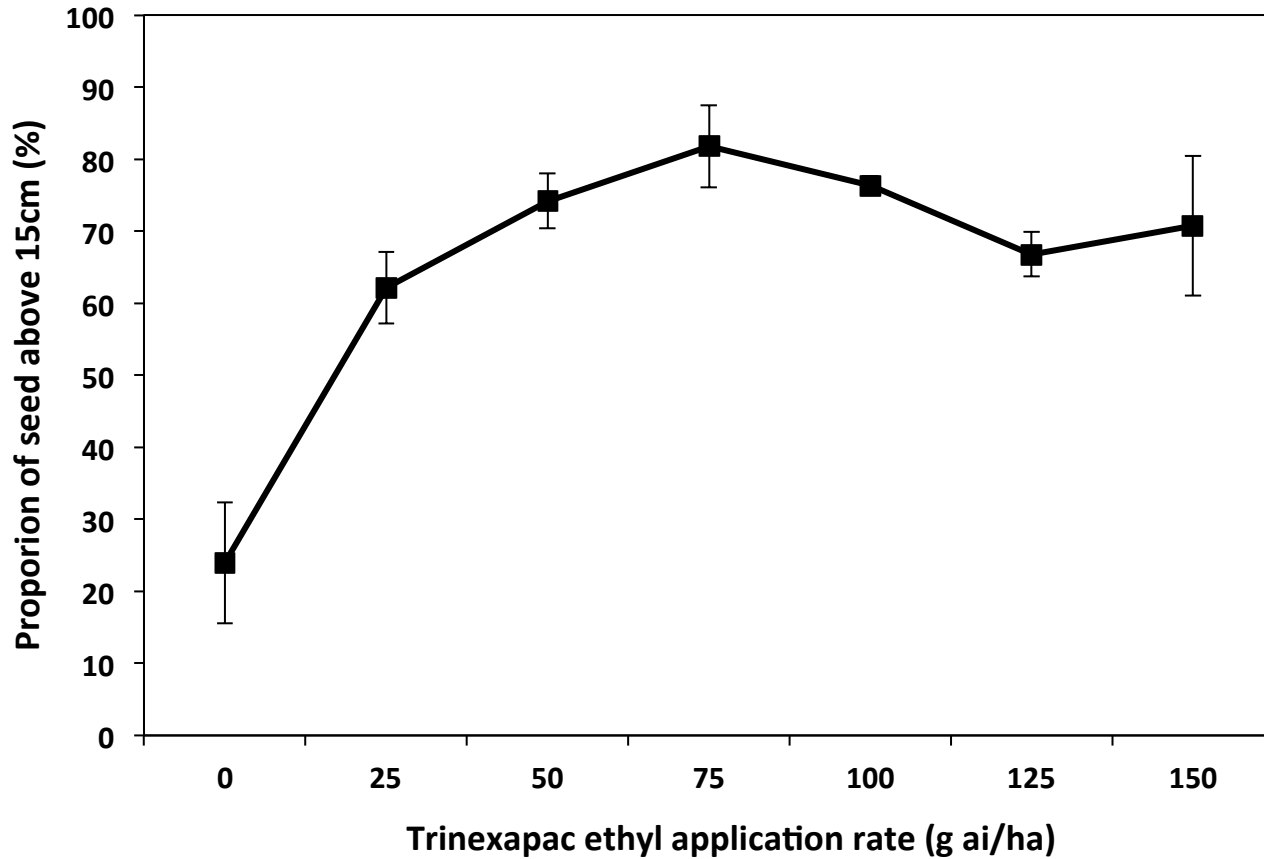
Increasing seed retention



Increasing seed retention



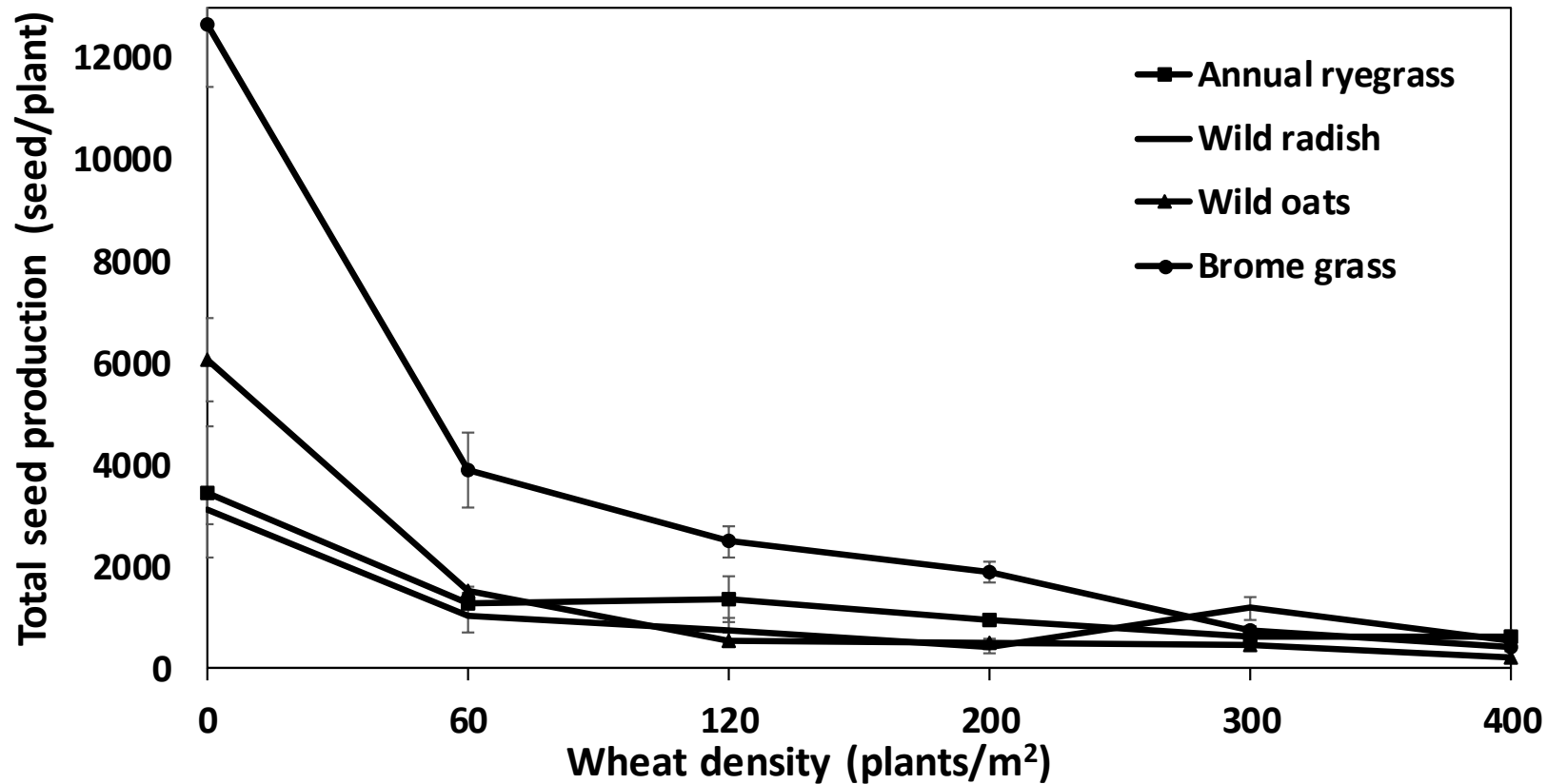
Growth regulator effects on brome grass seed retention



Increasing seed retention



Influence of crop competition on seed production



Increasing seed retention

Annual ryegrass seed retention

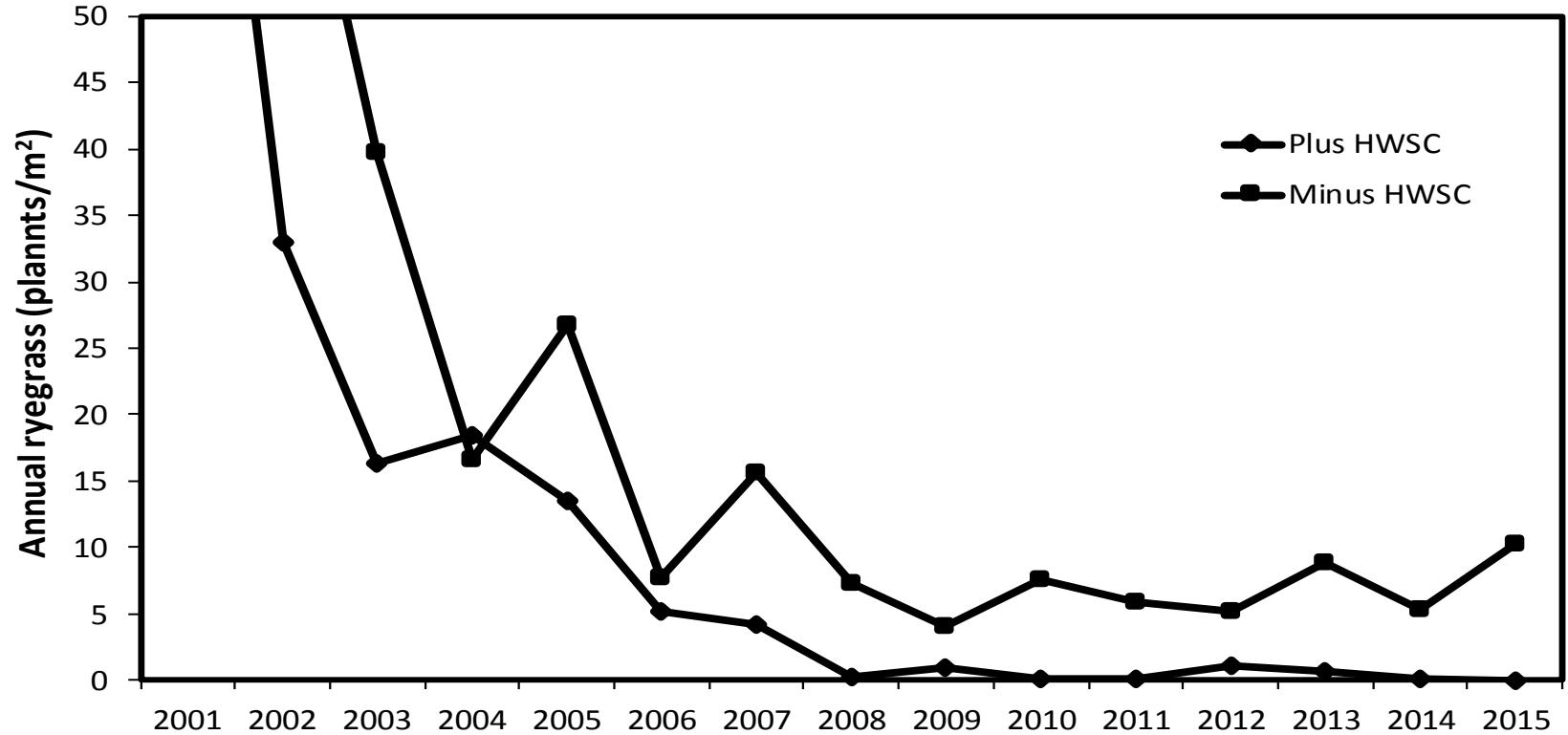
Barley 3 weeks after swathing

95% in swath

62% on standing plants

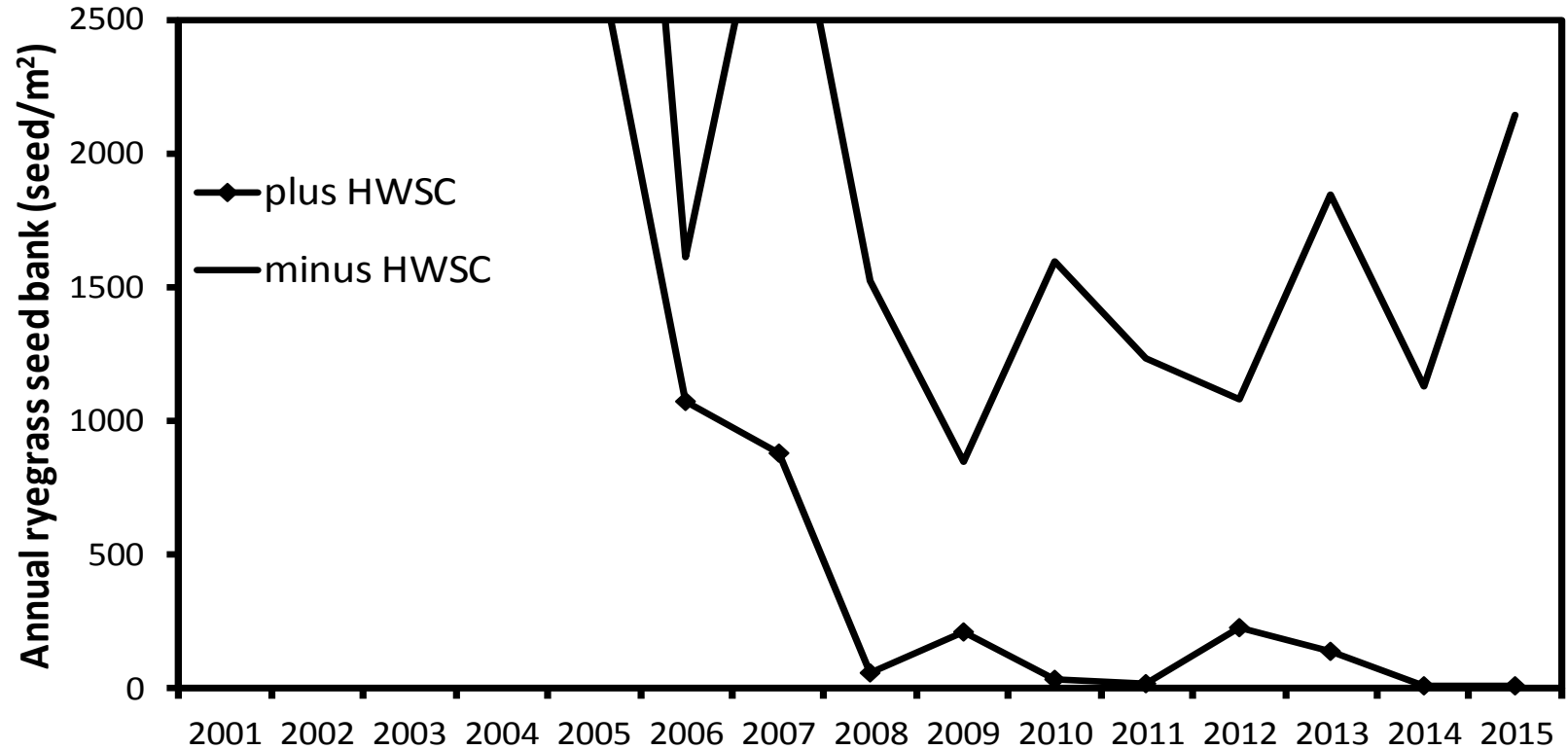
The value of HWSC

Focus paddocks - surviving ryegrass in spring



The value of HWSC

Focus paddocks - Estimated ryegrass seed set



Value of very low weed numbers

- Low cost weed control
- Reduced potential for resistance
- Flexibility in crops and cropping systems
- Timeliness of operations
- Conservation of nutrients and moisture etc.



Targeted Tillage



Targeted Tillage

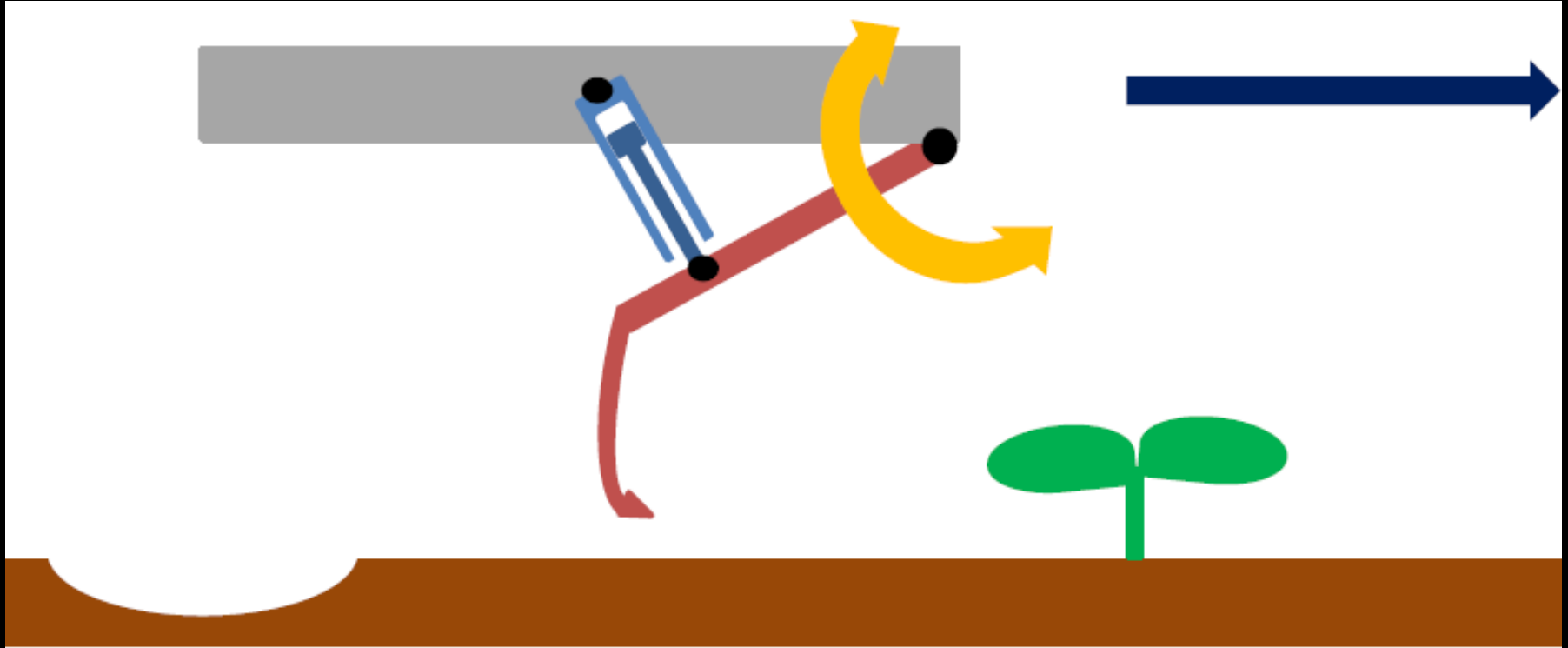
AHRI, QDAF, UQ

- Hydraulically activated tyne system that responds to information on mapped and identified weeds
 - Targeting low density weed populations
- Collaboration between UWA, UQ and QDAF
 - Farmer and industry advisory group

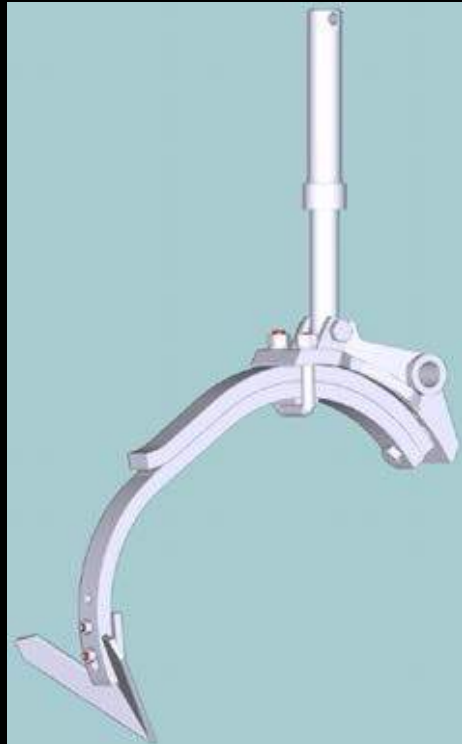


Shearer
trash worker
retrofit

Targeted Tillage



Targeted Tillage



Agricultural Engineering

Andrew Guzzomi, Carlo Peressini
Faculty of Engineering, Computing and Mathematics

Research

- Targeted tillage project

Honours student research projects

- Swarm farming
- Electrocuting of weeds
- Chaff refinement to reduce processing volume
- Static electricity for weed seed separation

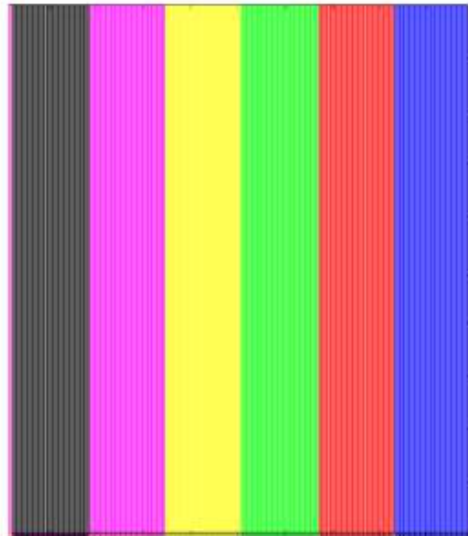
Teaching

- Masters in Agricultural Engineering

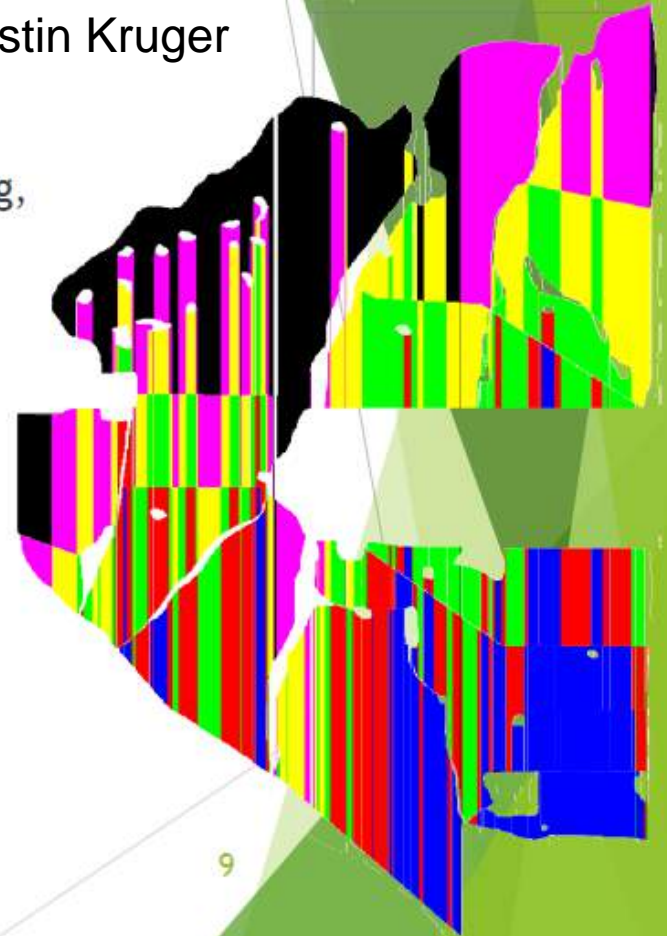
Simulation (2): Path Planning

Justin Kruger

- ▶ Generate paths, dividing working distance equally
- ▶ Simulate job: turns, weed recognition/removal, refuelling, etc., with resulting statistics



- Vehicle 1
- Vehicle 2
- Vehicle 3
- Vehicle 4
- Vehicle 5
- Vehicle 6



Weed electrocution

Faraz Ahmed

