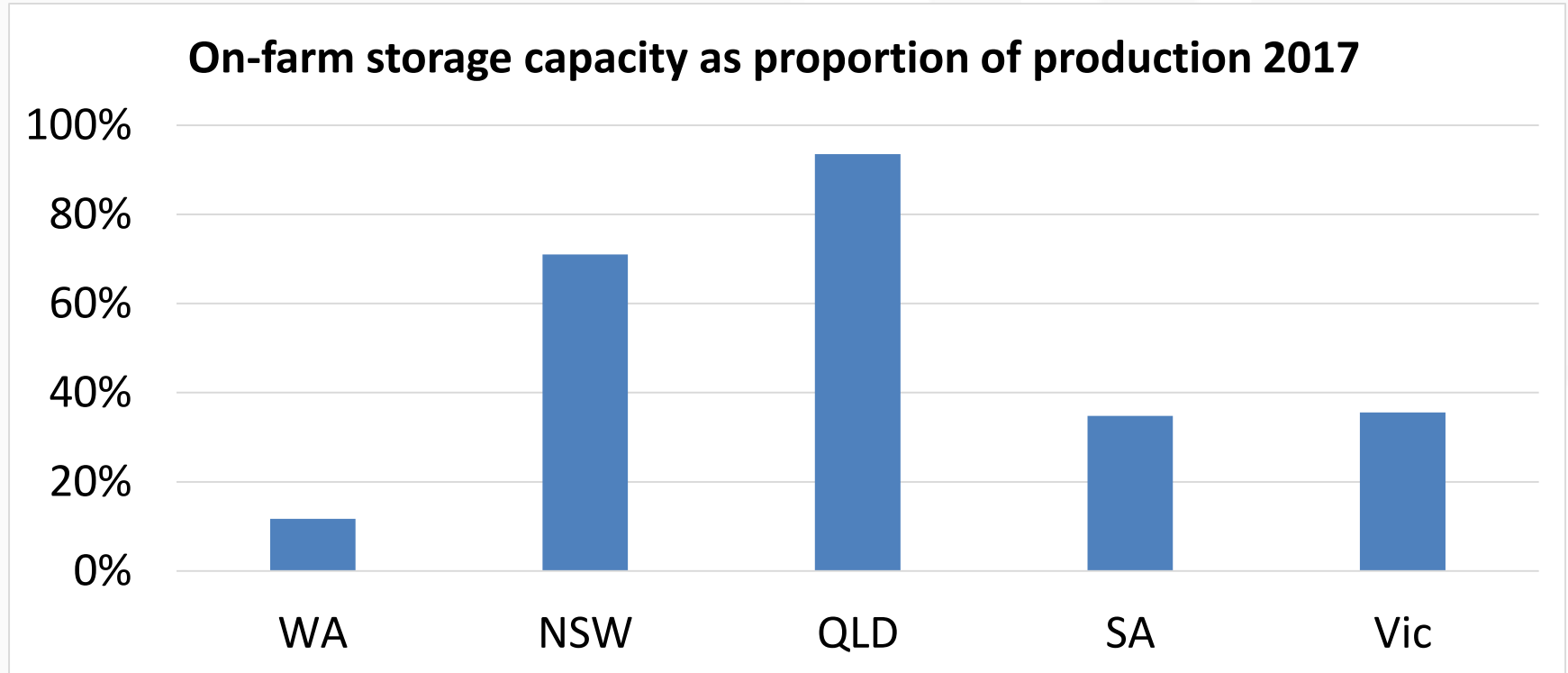


ON-FARM GRAIN STORAGE IN WESTERN AUSTRALIA  
CURRENT STATUS, CHALLENGES & SUPPORT  
BEN WHITE – GRDC GRAIN STORAGE EXTENSION - WA

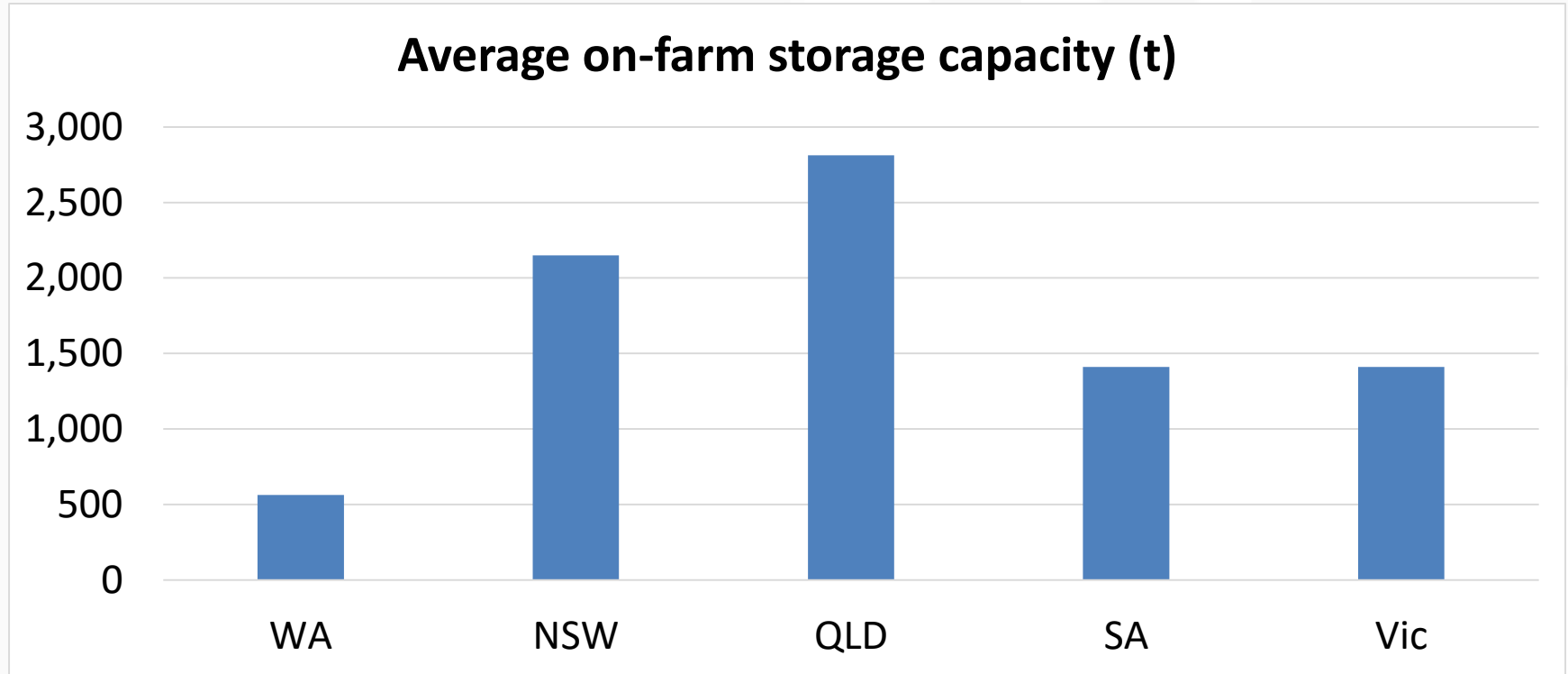


**GRDC**  
GRAINS RESEARCH  
& DEVELOPMENT  
CORPORATION

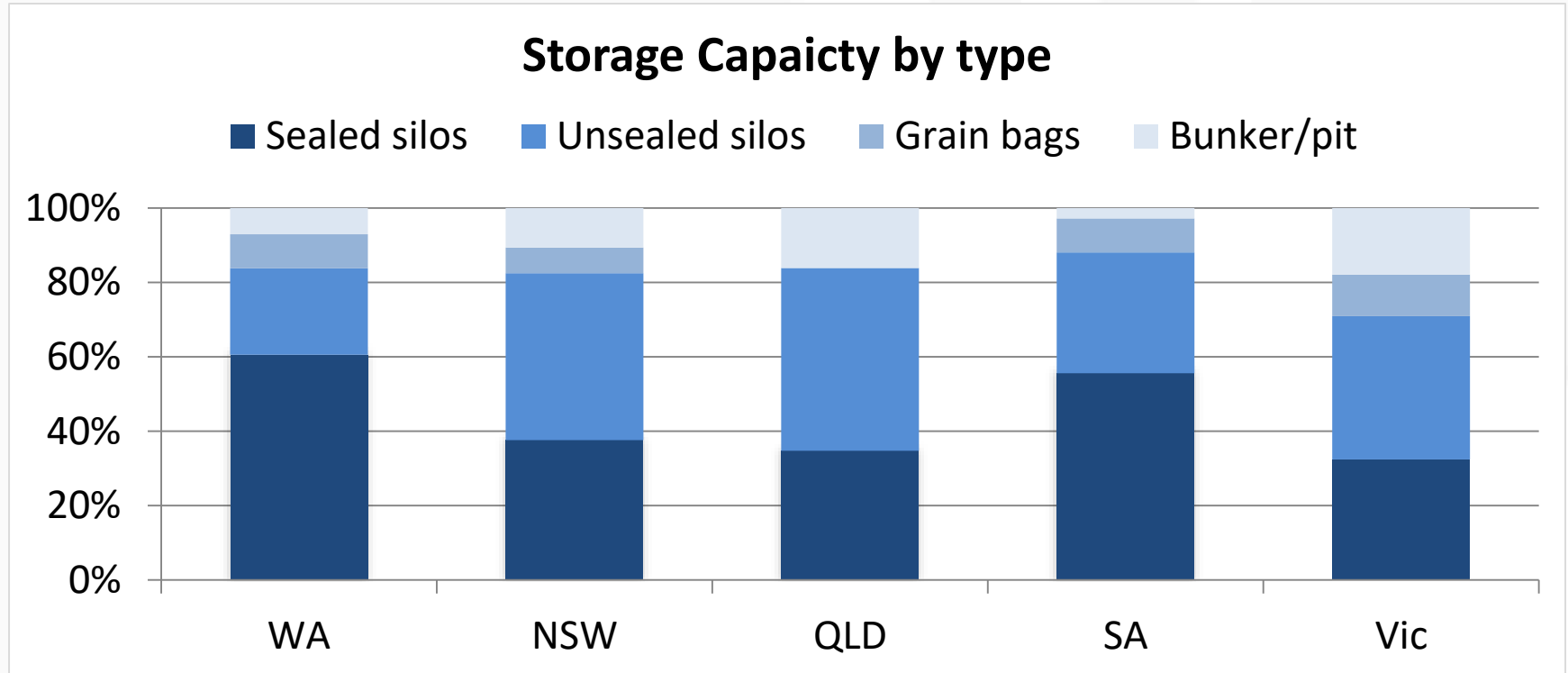
# ON-FARM STORAGE STATUS: WA



# ON-FARM STORAGE STATUS: WA



# ON-FARM STORAGE STATUS: WA



# Chemical treatments - resistance

cereal grains Northern & Southern grain regions – QLD, NSW, VIC, SA, TAS

TREATMENTS								
	WHP (days)	Lesser grain borer	Rust red flour beetle	Rice weevil	Saw-toothed grain beetle	Flat grain beetles	Psocids	Structural Treatments*
Phosphine e.g. Fumitoxin™ In gas tight / sealable storages	2	✓	✓	✓	✓	✓SR	✓	✓
Sulfuryl Fluoride - Profume™ In gas tight / sealable storages #	1	✓	✓	✓	✓	✓	md	✓
Controlled atmosphere - CO <sub>2</sub> N <sub>2</sub>	nil	✓	✓	✓	✓	✓	✓	md
Ethyl formate + CO <sub>2</sub> e.g. Vapormate™ #	nil	✓	✓	X P	✓	✓	✓	✓
Pirimiphos-methyl e.g. Actellic™	nil	X	✓	✓	⊗	✓	X	*
Fenitrothion e.g. Fenitrothion 1000™	1 - 90	X	✓	✓	⊗	✓	X	*
Chlorpyrifos-methyl e.g. Reldan™	nil	X	✓	✓	⊗	✓	X	*
Methoprene e.g. IGR™ or Rizacon™	nil	⊗	✓	X	✓	✓	X	NR
Chlorpyrifos-methyl + S-methoprene e.g. Reldan pluS™	nil	⊗	✓	✓	✓	✓	X	*
Deltamethrin + Piperonyl Butoxide + OP e.g. K-Obiol™ + (Reldan or Fenitrothion)	nil	✓®	✓	✓	✓	✓	X	NR
Spinosad + S-methoprene + OP e.g. Conserve Plus™ + (Reldan or Fenitrothion)	nil	✓	✓	✓	✓	✓	✓	NR
Diatomaceous earth – (DE) Amorphous silica e.g. Dryacide™	nil	✓	✓	✓	✓	✓	md	✓

✓ Effective control - resistance never or rarely detected

⊗ Resistance widespread - unlikely to be effective

X Not effective

\* Resistant species likely to survive this structural treatment

NR Not registered for this use

md more data - Australian research required

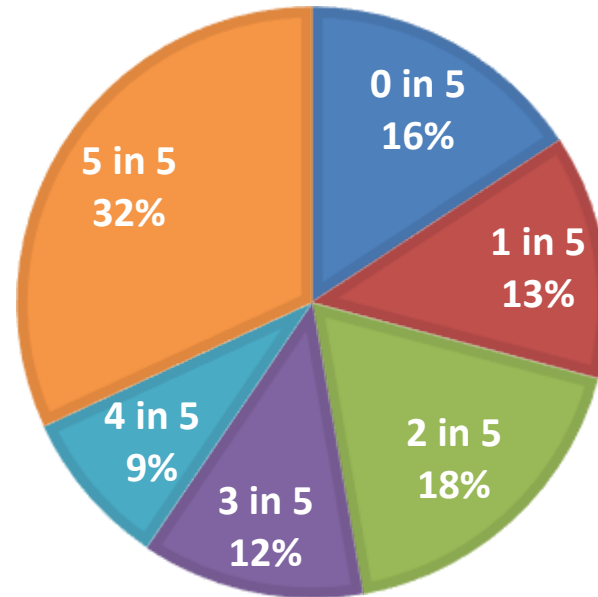
SR some Strong phosphine resistant strains of Rusty grain beetle *Cryptolestes ferrugineus*, also known as Flat grain beetles.

® Resistance detected

# ON-FARM STORAGE STATUS/CHALLENGES

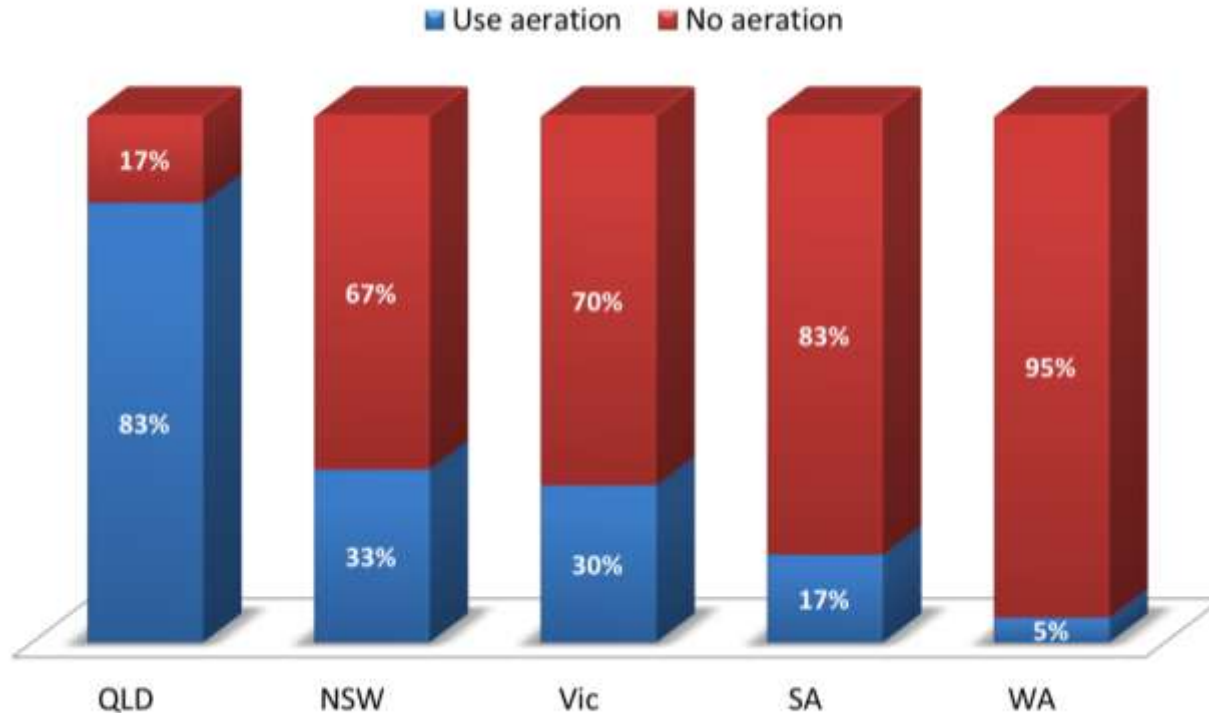


PHOSPHINE USE OVER THE PAST FIVE YEARS: NUMBER OF YEARS USED



# ON-FARM STORAGE STATUS/CHALLENGES

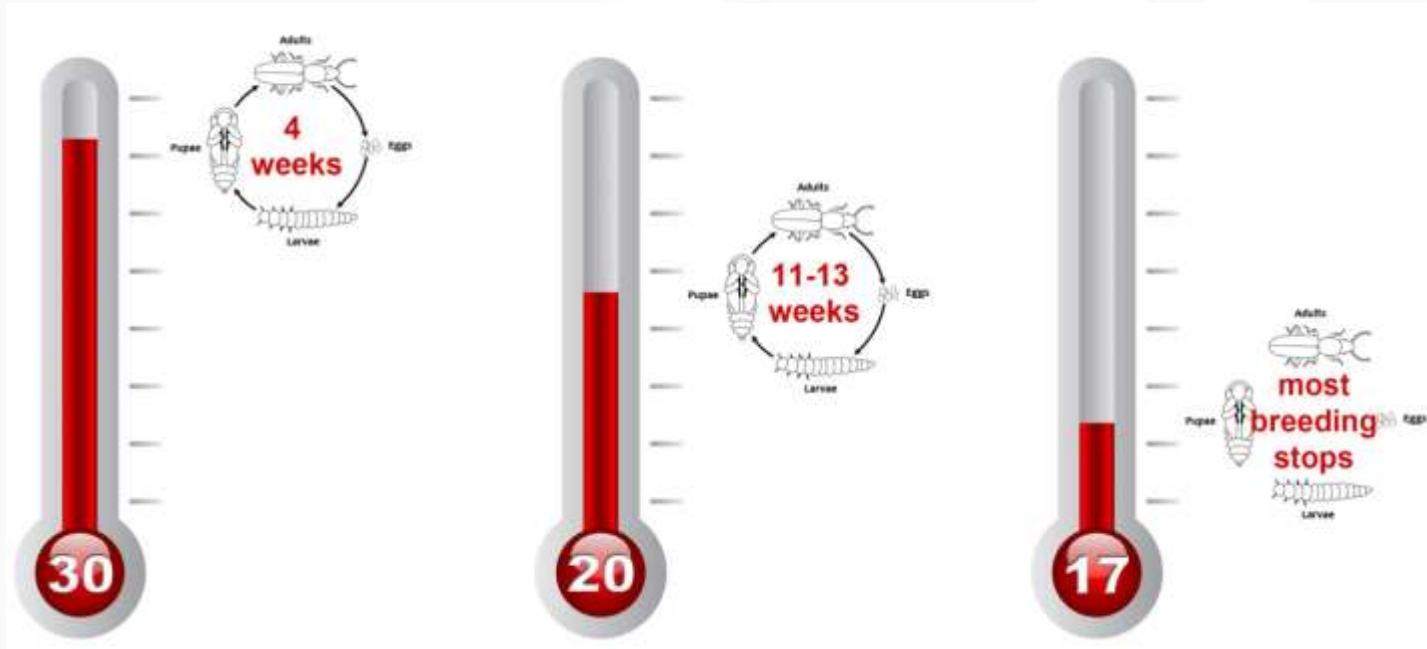
Proportion of growers with on-farm storage using aeration





# ON-FARM STORAGE STATUS/CHALLENGES

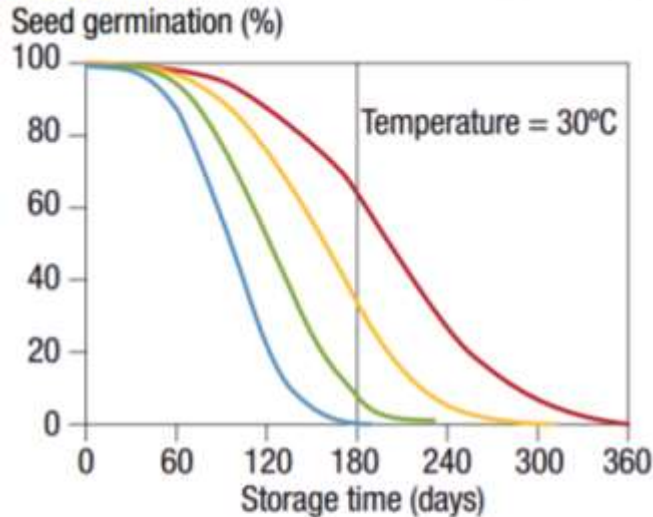
- Aeration cooling may not eliminate the need for chemical insect control, but it will dramatically slow insect development.



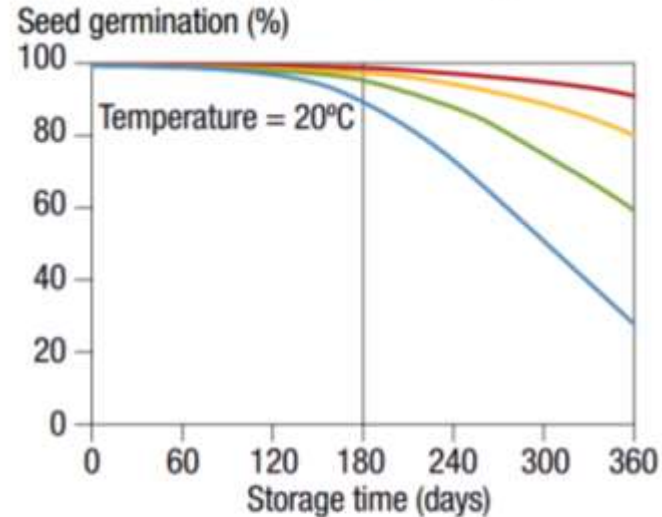


# ON-FARM STORAGE STATUS/CHALLENGES

**FIGURE 1** Influence of storage temperature and moisture on seed vigour



- 12% moisture content
- 13% moisture content
- 14% moisture content
- 15% moisture content

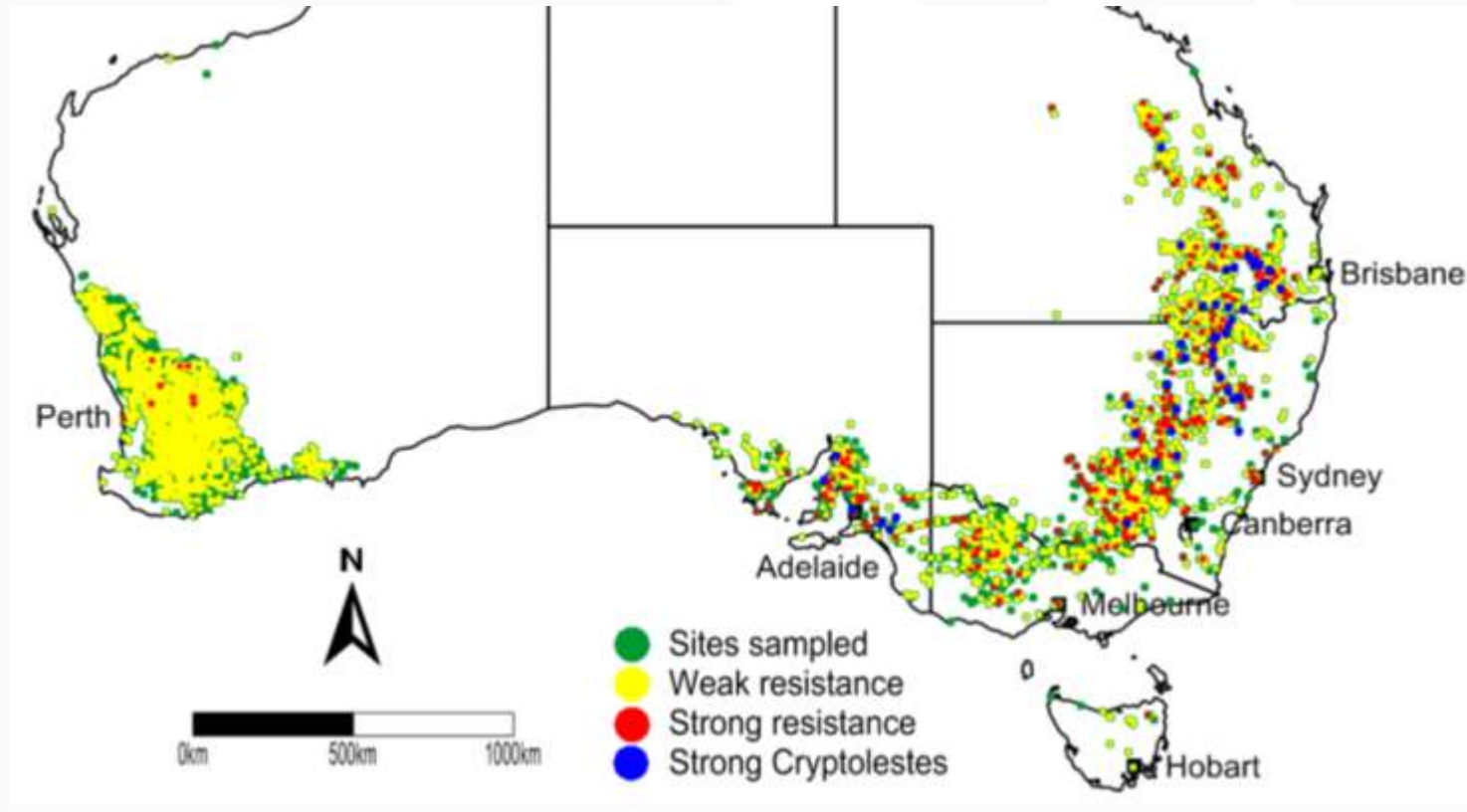


- 12% moisture content
- 13% moisture content
- 14% moisture content
- 15% moisture content

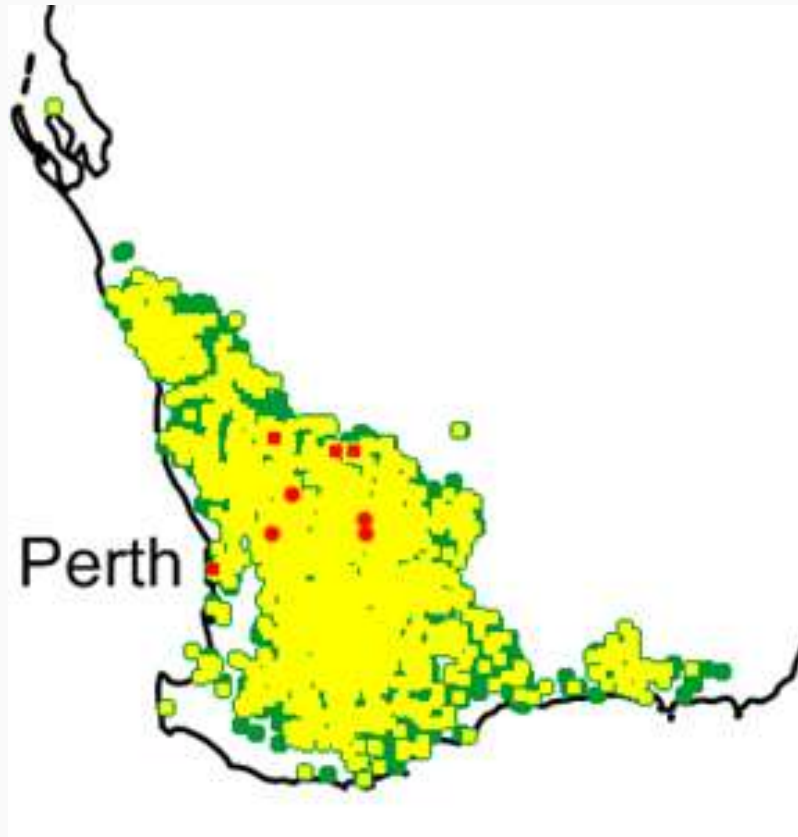
NB: The figure on the left shows the influence of moisture content on germination of wheat stored at 30°C and the figure on the right shows the influence of moisture content on germination of wheat stored at 20°C

SOURCE: CSIRO Stored Grain Research Laboratory

# ON-FARM STORAGE STATUS: CHALLENGES



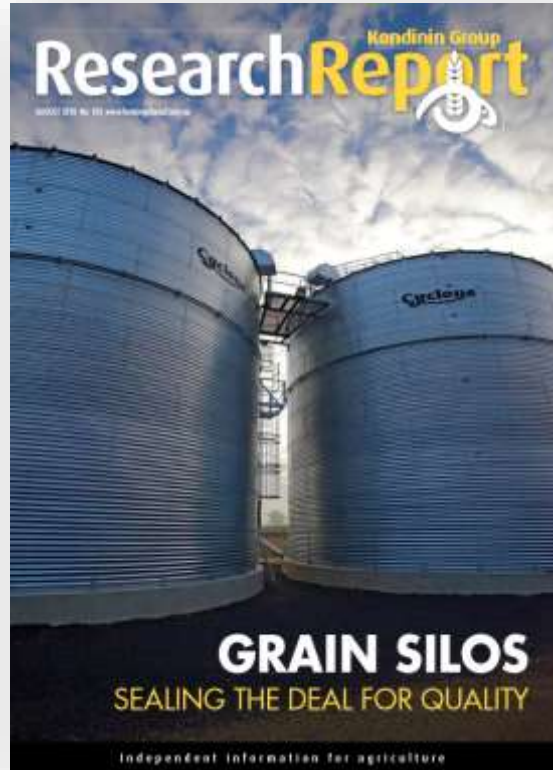
# ON-FARM STORAGE STATUS: CHALLENGES



- We are at risk of more strong phosphine resistance in WA
- 12% of WA phosphine users don't have *any* sealed storages
- 60% of these use phosphine every year  
(2017 Kondinin Group NAS)

# ON-FARM STORAGE STATUS: CHALLENGES

- Not all silos are created equal - \$/t means nothing if it doesn't work as required!



**“fair enough we didn't pass sealed test.  
I can assure you they did when built...  
...do not ever include us in your bull\$#\*t  
surveys again”**

*Silo manufacturer*

*One season after \$300k silo was constructed*

# ON-FARM STORAGE STATUS: SUPPORT

- Grain storage workshops and assistance around WA





# ON-FARM STORAGE STATUS: SUPPORT


- Grain storage workshops and assistance around WA – Part of a national GRDC investment

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