# Apical pruning to delay flowering and avoid frost in early sown wheat and barley

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# Enhancing frost tolerance and/or avoidance in wheat, barley and canola crops through in-season agronomic manipulation


**Project team**

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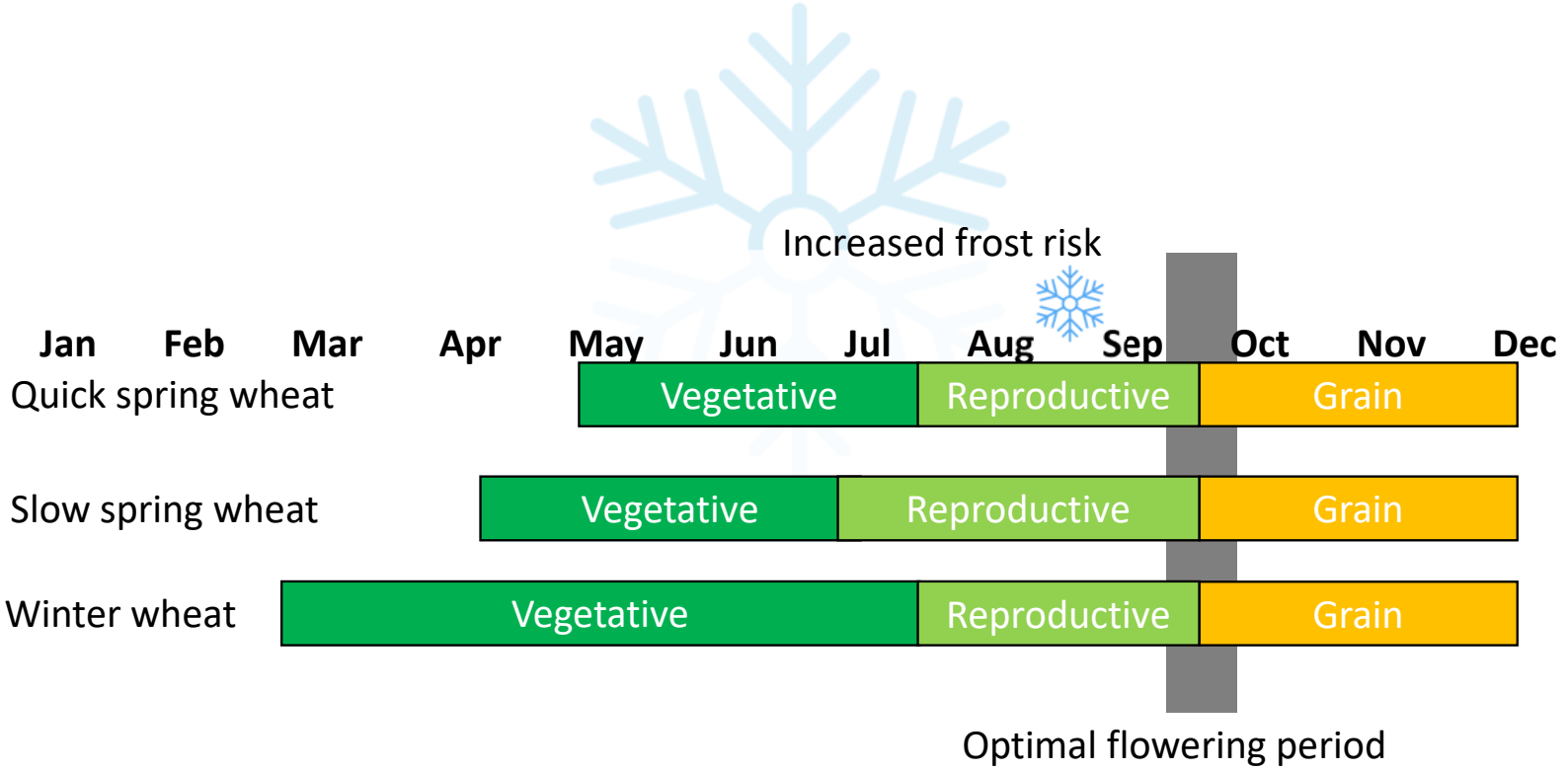
# Apical pruning concept

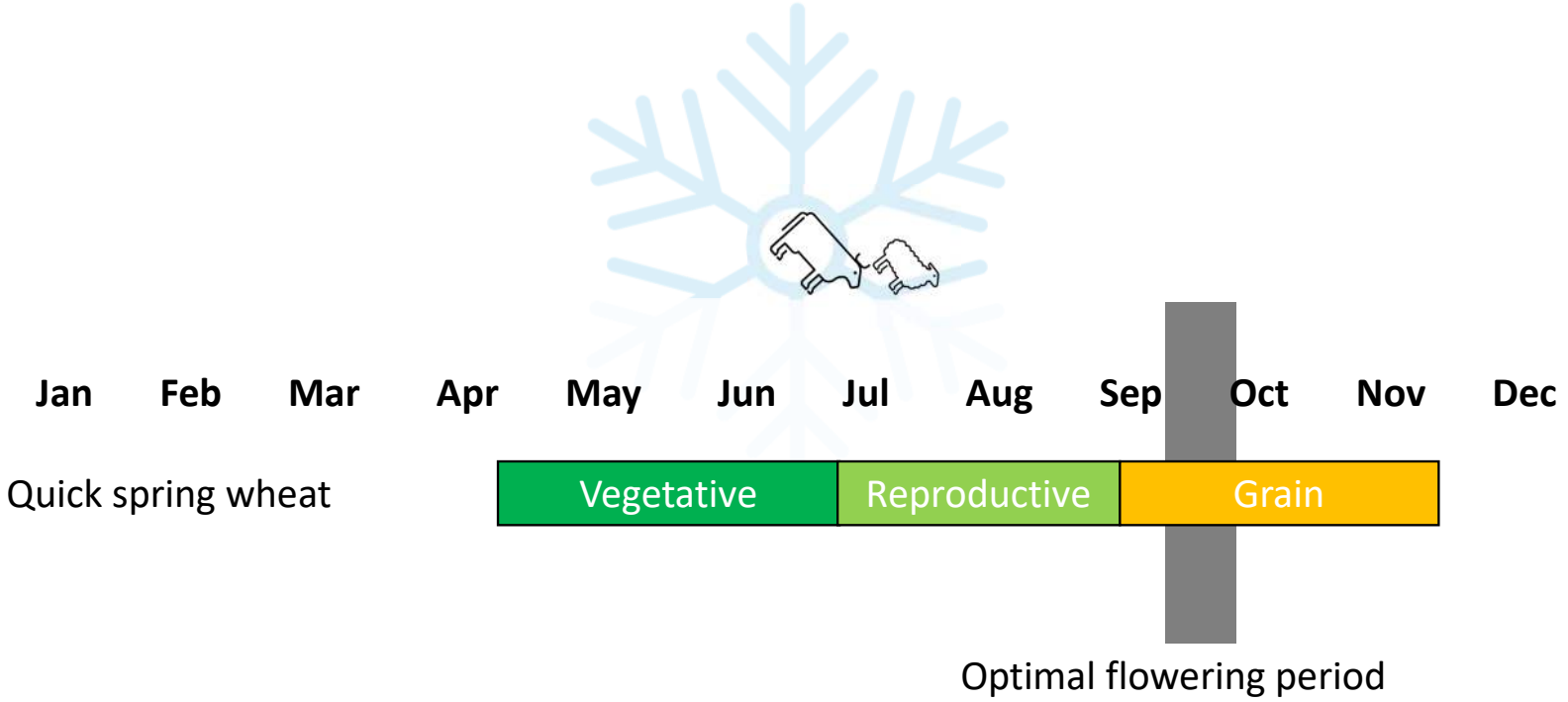
- Spread risk within sowing program of a single cultivar
- Horticulture and viticulture practice apical pruning in perennial crops
- In mixed farms, annual crops are grazed before transition to reproductive phase
- What happens when grazing/defoliation occurs later (early stem elongation)?
- Porker et al 2022 demonstrated the concept in SA environments

# Cereal phenology



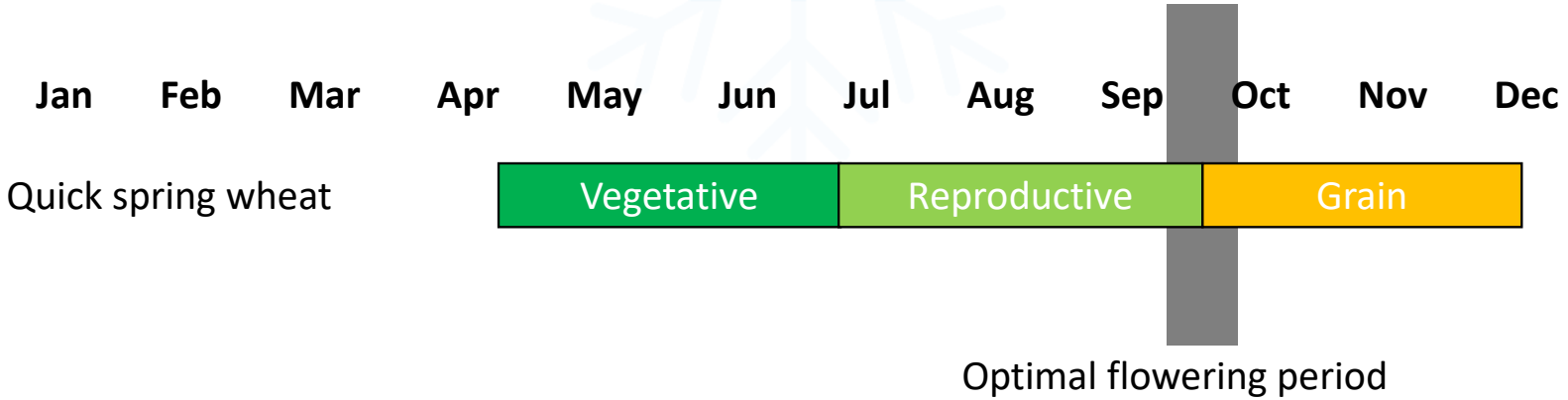

Adapted from Hunt 2017

# Apical pruning on quick cultivars




Adapted from Hunt 2017

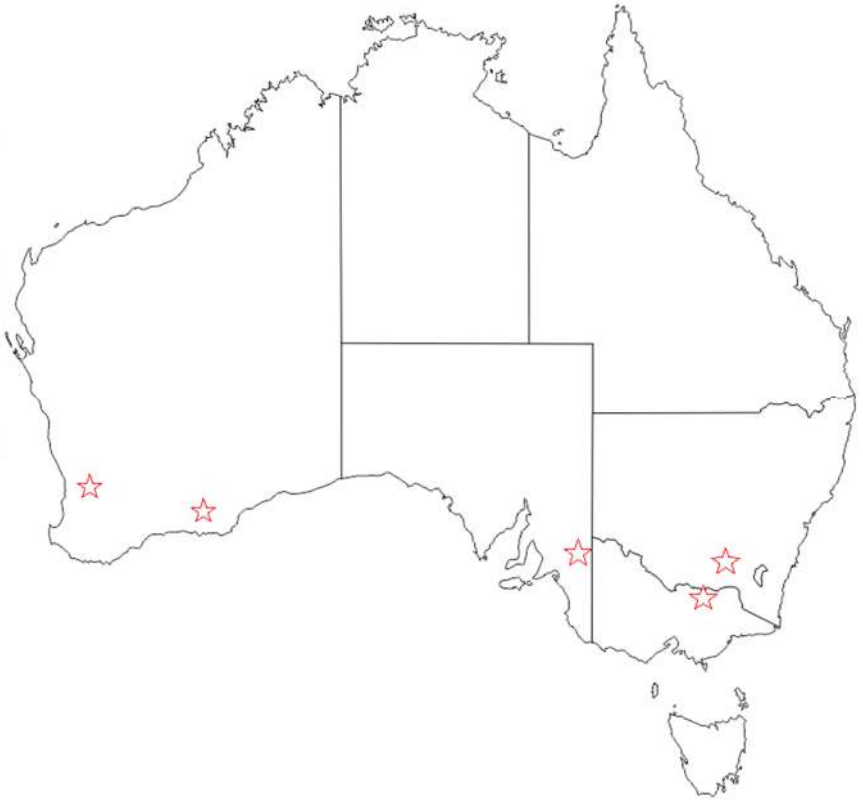
# Apical pruning on quick cultivars




Adapted from Hunt 2017

# 2023 field experiments

- Five sites – Dale, Salmon Gums (WA), Loxton (SA), Wagga (NSW), Yarrawonga (VIC)
- 3 TOS – early, standard, late
- 6 wheat, 3 barley* cultivars
- Two defoliation treatments in quick wheat and barley cultivars in TOS 1 and TOS2
- Defoliation intensities guided by pre-experimental APSIM modelling



*barley at 3 of 5 sites

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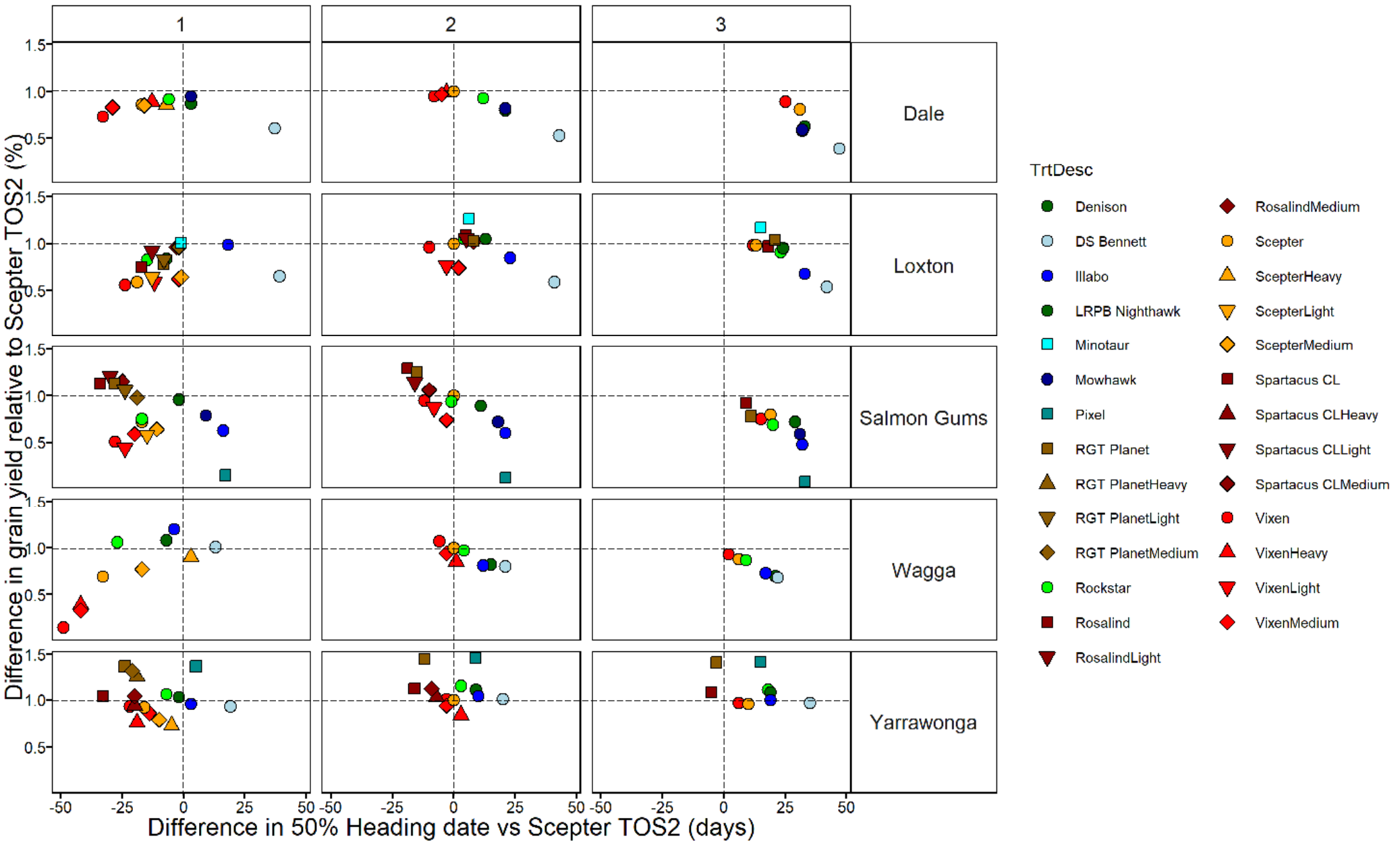
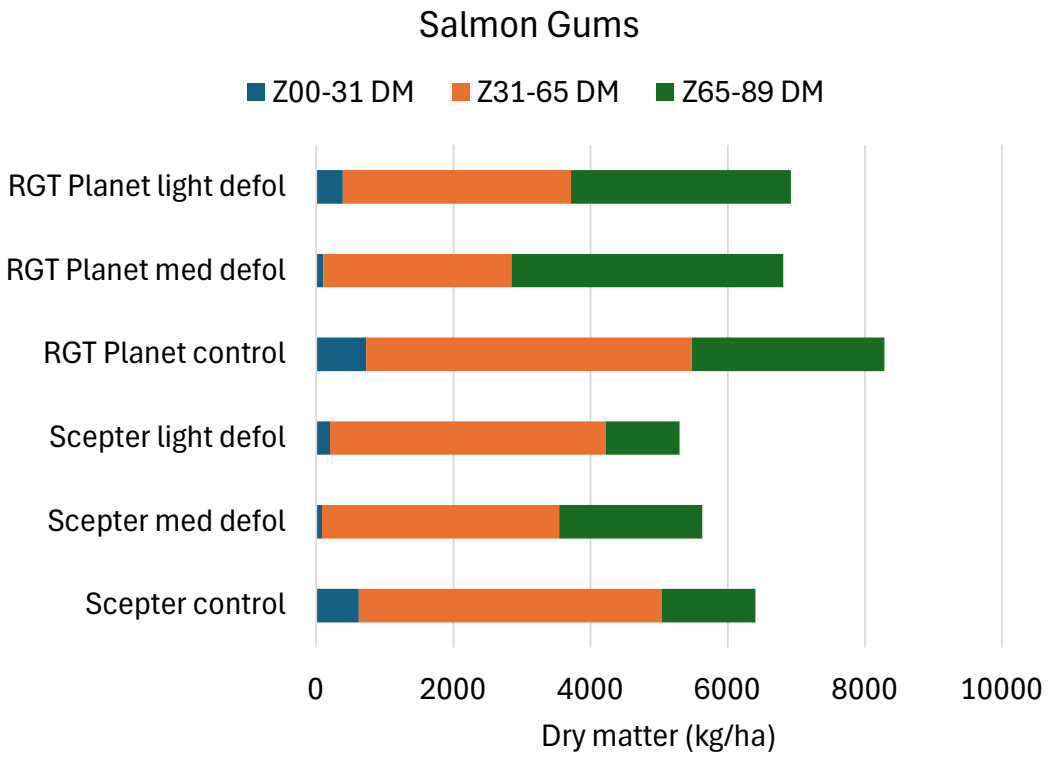
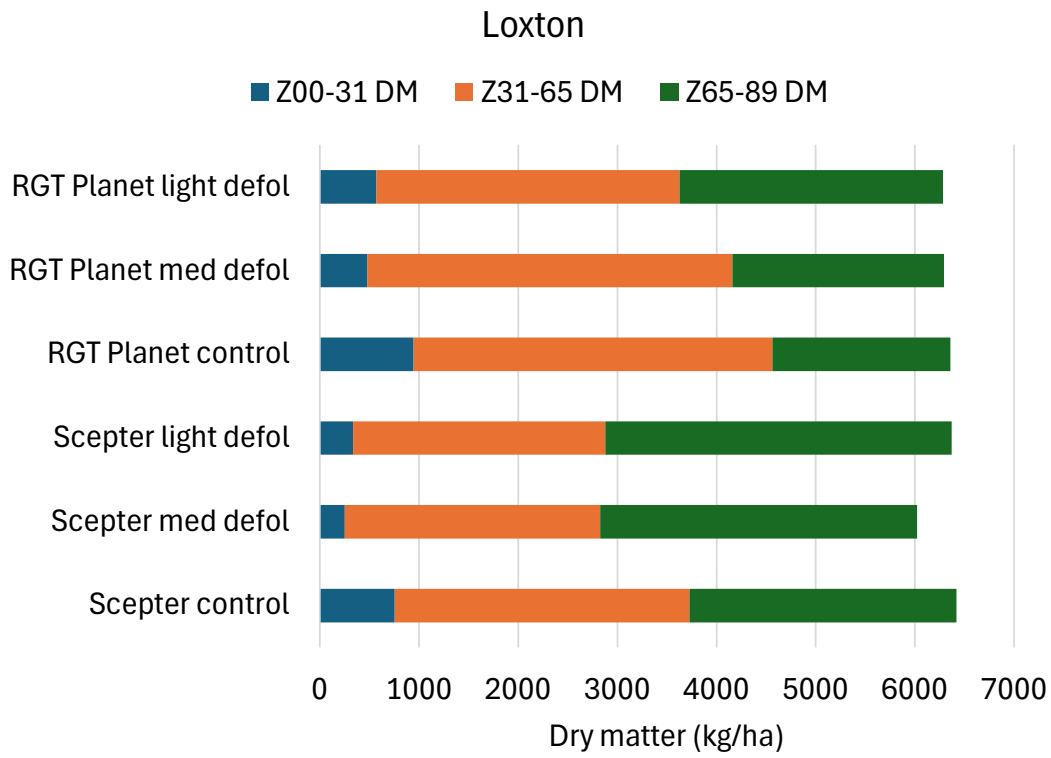
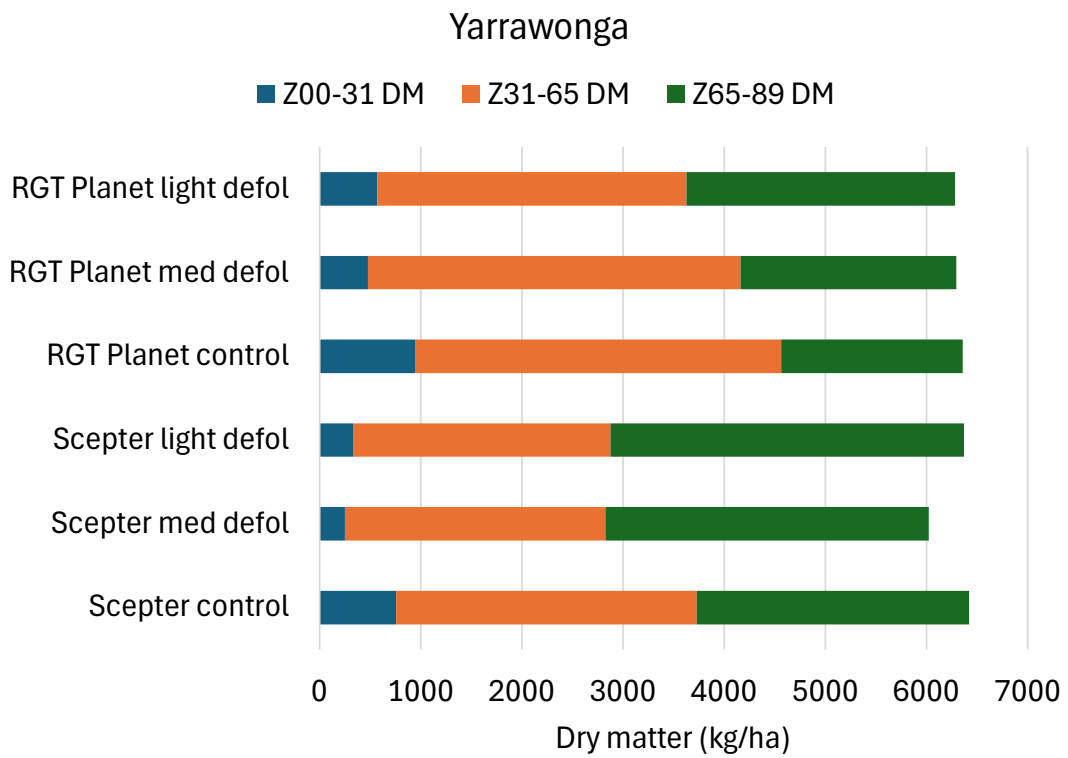

1
2
3
Dale
Loxton
Salmon Gums
Wagga
Yarrawonga
Difference in grain yield relative to Scepter TOS2 (%)
Difference in 50% Heading date vs Scepter TOS2 (days)
1.5
1.0
0.5
-50
-25
0
25
50
TrtDesc
Denison
DS Bennett
Illabo
LRPB Nighthawk
Minotaur
Mowhawk
Pixel
RGT Planet
RGT PlanetHeavy
RGT PlanetLight
RGT PlanetMedium
Rockstar
Rosalind
RosalindLight
RosalindMedium
Scepter
ScepterHeavy
ScepterLight
ScepterMedium
Spartacus CL
Spartacus CLHeavy
Spartacus CLLight
Spartacus CLMedium
Vixen
VixenHeavy
VixenLight
VixenMedium

# Wheat vs barley



# Wheat vs barley



# Conclusions (and more questions…)

- Pruning in TOS1 generally maintained or improved grain yield despite relatively frost-free conditions
- Slower phenology cultivars or later sowing were better options than apical pruning quick cultivars
- Downside risk of late established winter wheat also a consideration
- Is early established barley a better alternative to slower wheat?
- Where could this fit in the farming system?

# Thank you

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