

Annual clovers in the Mackenzie Basin

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New Zealand's specialist land-based university

Omarama Station 'Red Flats'

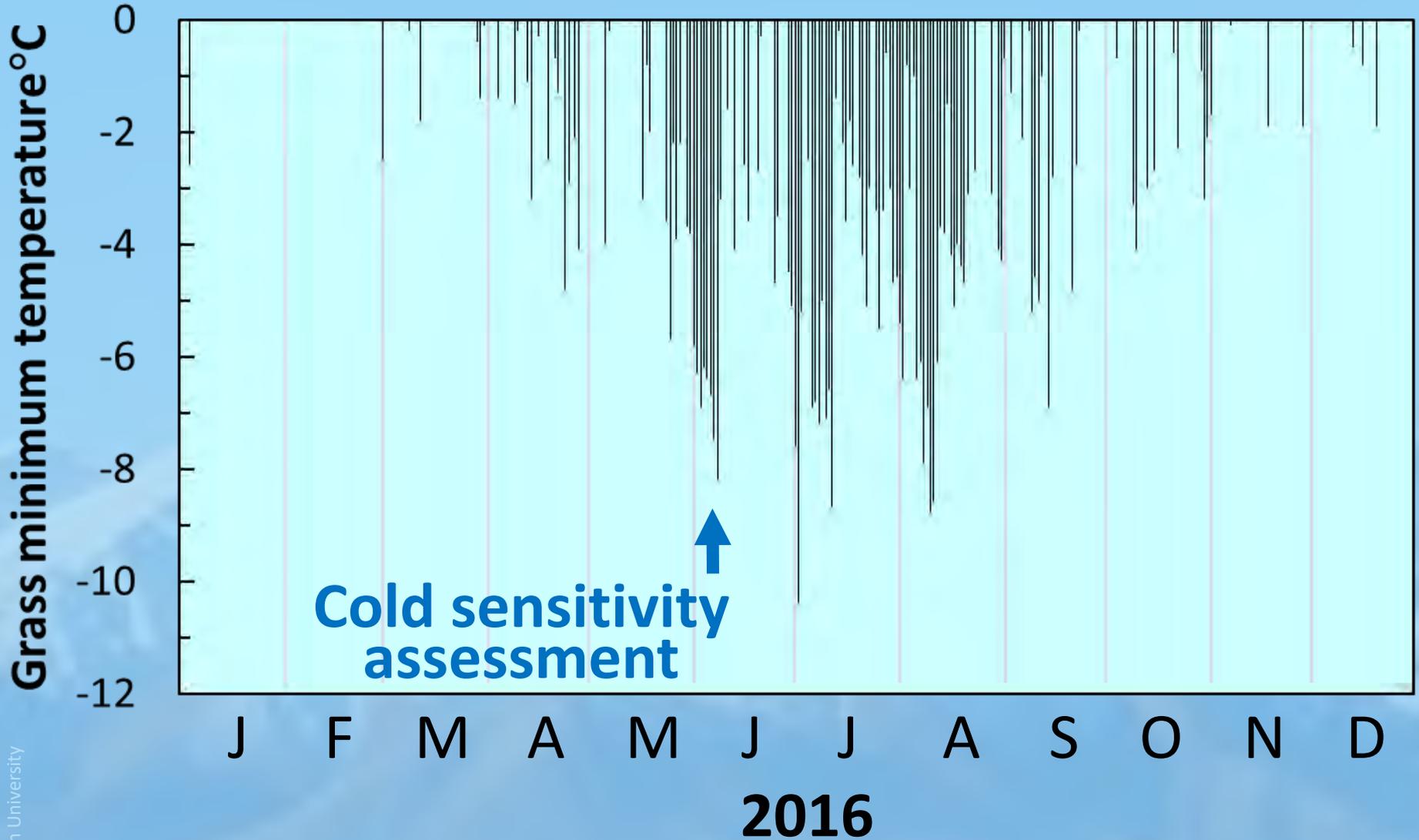
Question:

Will the annual clovers,
subterranean and balansa,
establish and survive?

Omarama Station 'Red Flats'

- ☀️ Flat dryland pasture site
- ☀️ Winter cold and summer dry
- ☀️ Tussock grassland with sorrel and hieracium
- ☀️ Mackenzie soils:
 - 🪨 low plant water
 - 🪨 nutrients in top 75 mm
 - 🪨 high Al below 75 mm
 - 🪨 inputs of S and P + lime

2016 winter cold: frosts



2016 cold sensitivity

7th June

Sub clover cold sensitivity scores

🍀 cultivar differences ($P < 0.001$) explained by sub species:

- *yanninicum* ssp. score = 1.9
- *subterraneum* ssp. = 0.4
- *brachycalycinum* ssp. = 0.0

2016 cold sensitivity

7th June



Brachycalycinum 'Antas' = 0



Yanninicum 'Napier' = 2.4

2016 cold sensitivity

7th June

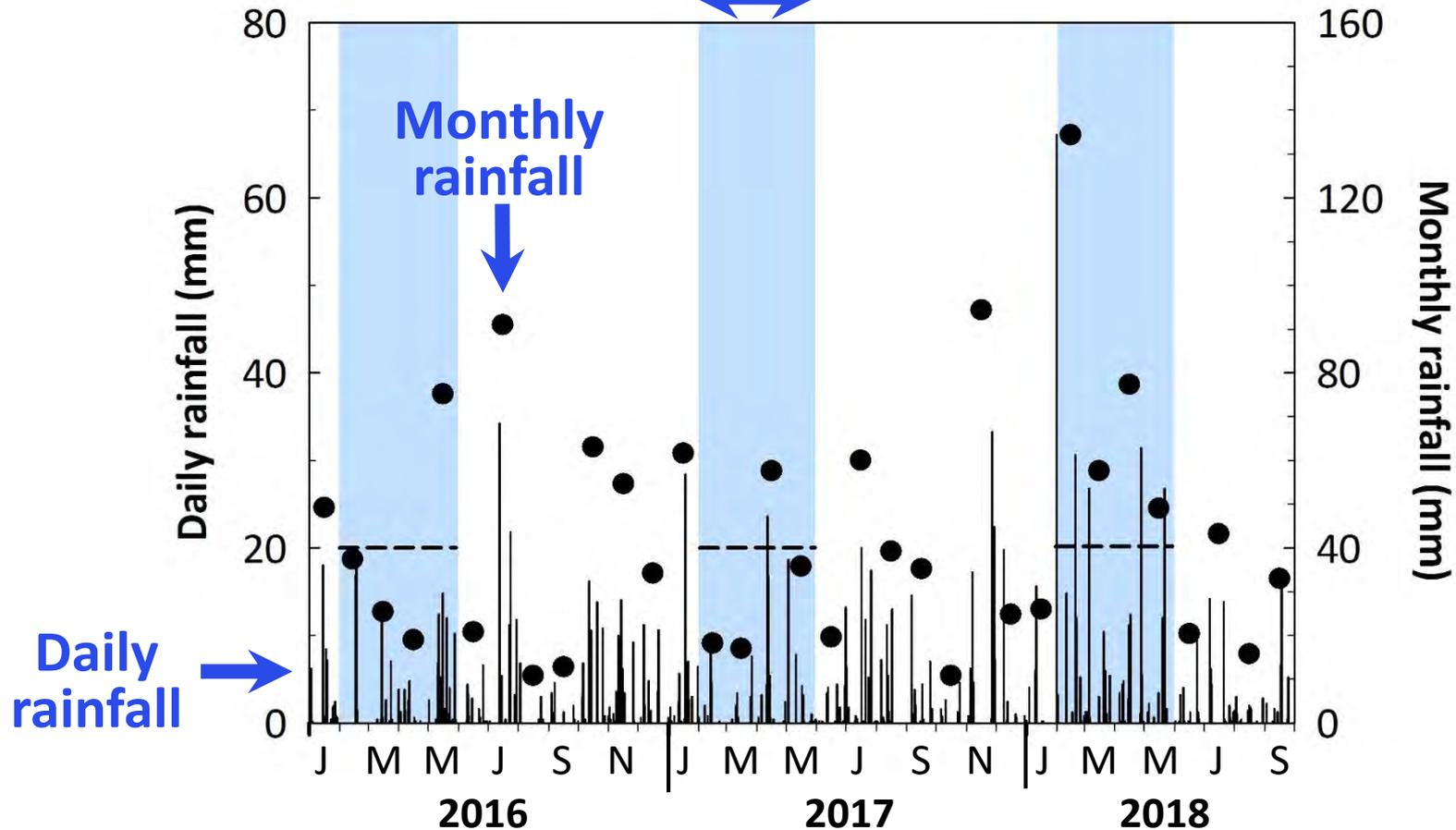
Sub clover cold sensitivity scores

🍀 no correlation with spring yield (3rd November)

Omarama rainfall

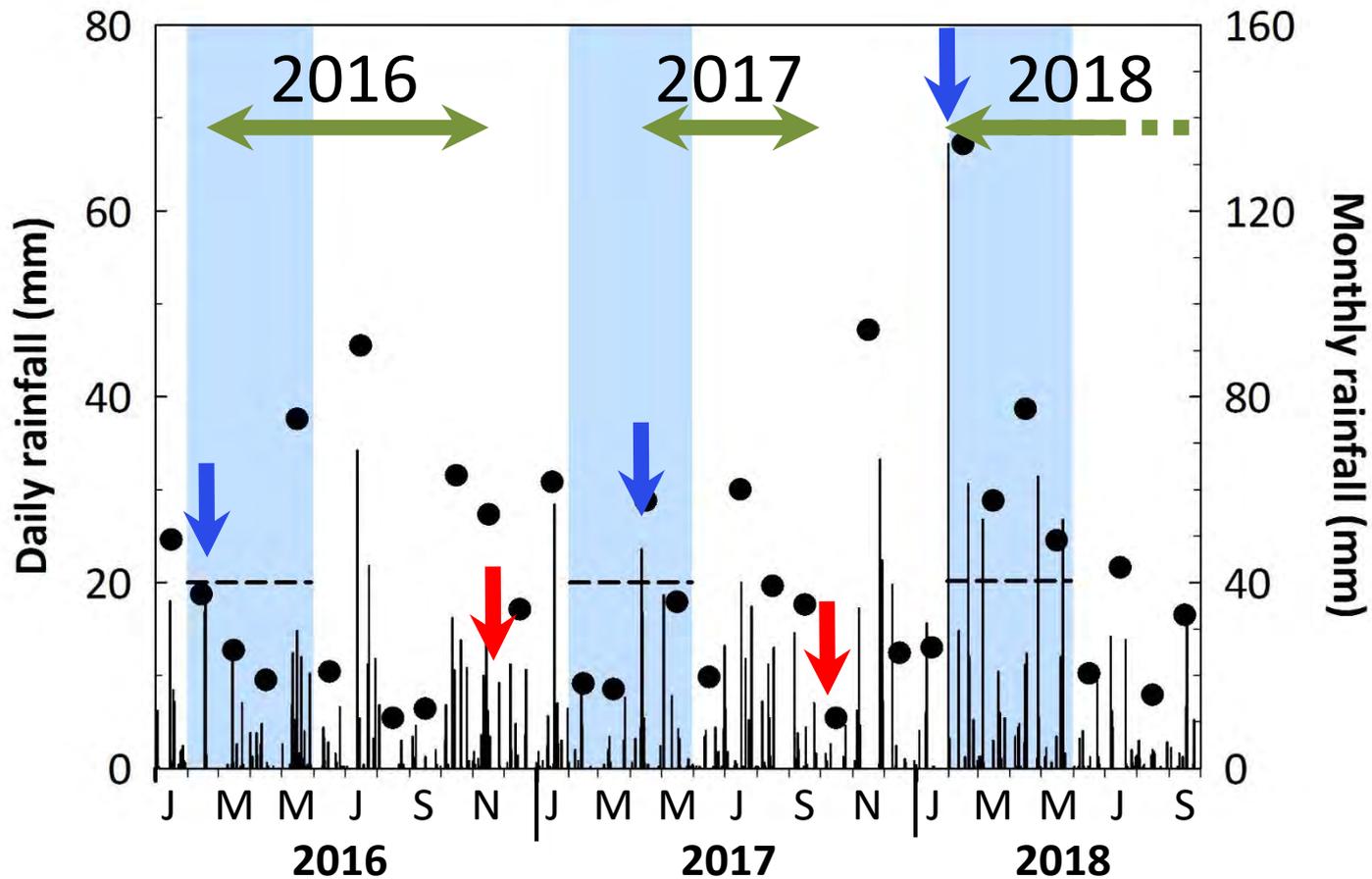
Rain \sim 500 mm/yr PET \sim 1000 mm/yr

Germination period



Omarama rainfall

Feb to May: >20 mm rain = sub germination



2016 establishment

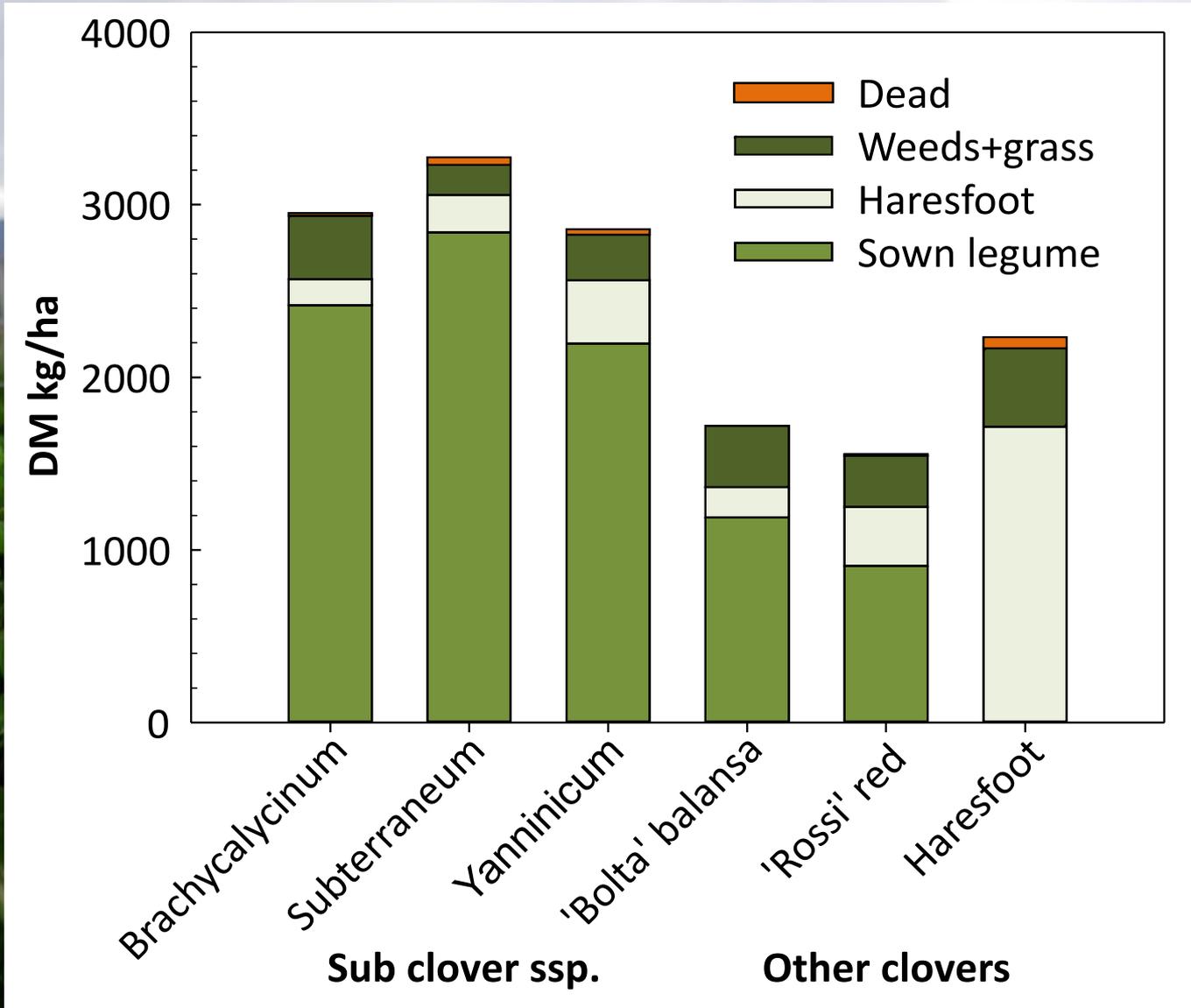
31st Mar



Sub clover 'Campeda'

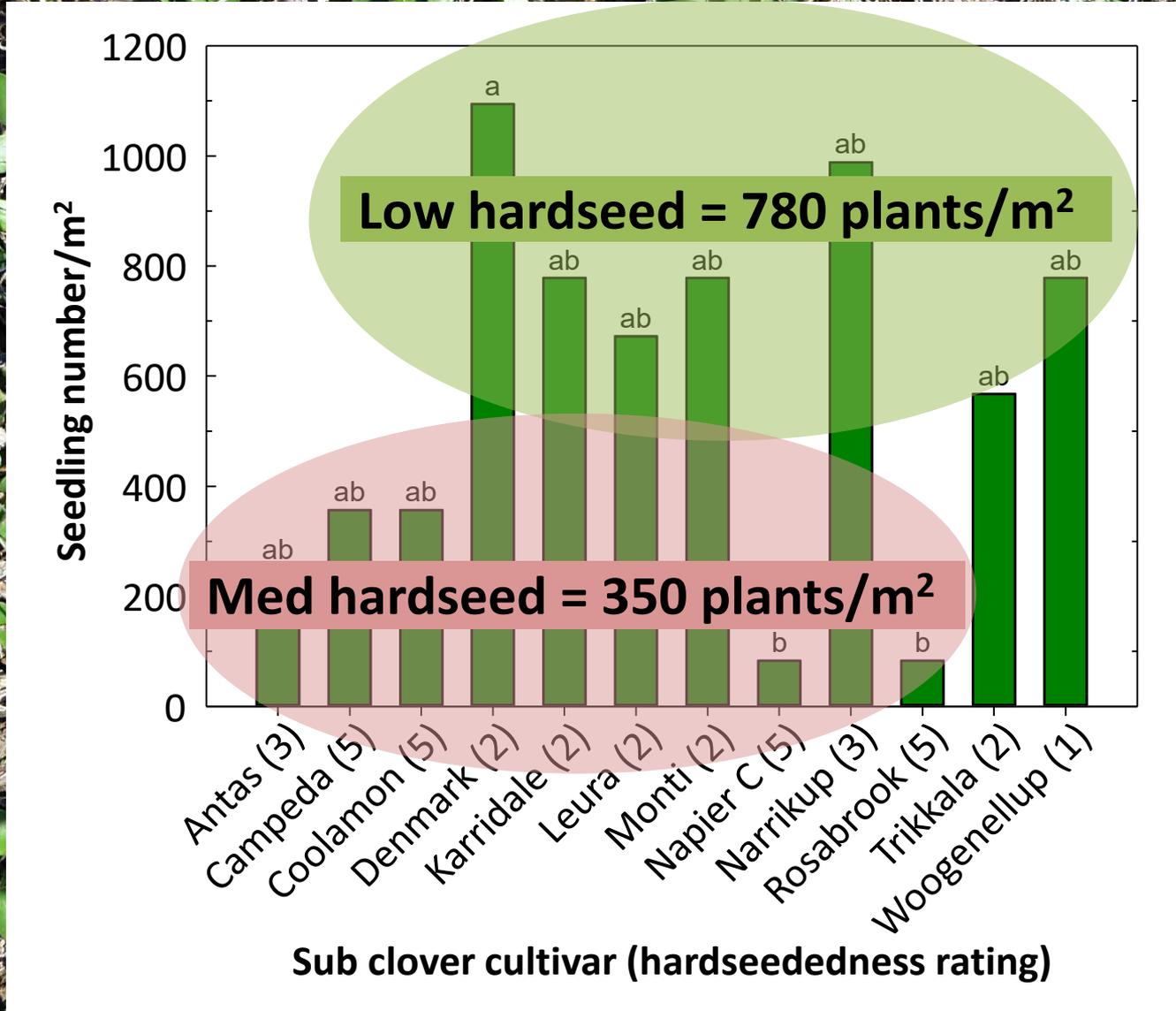
2016 spring yield

3rd Nov



2017 re-establishment

25th May



2017 dry matter yield

20th Oct



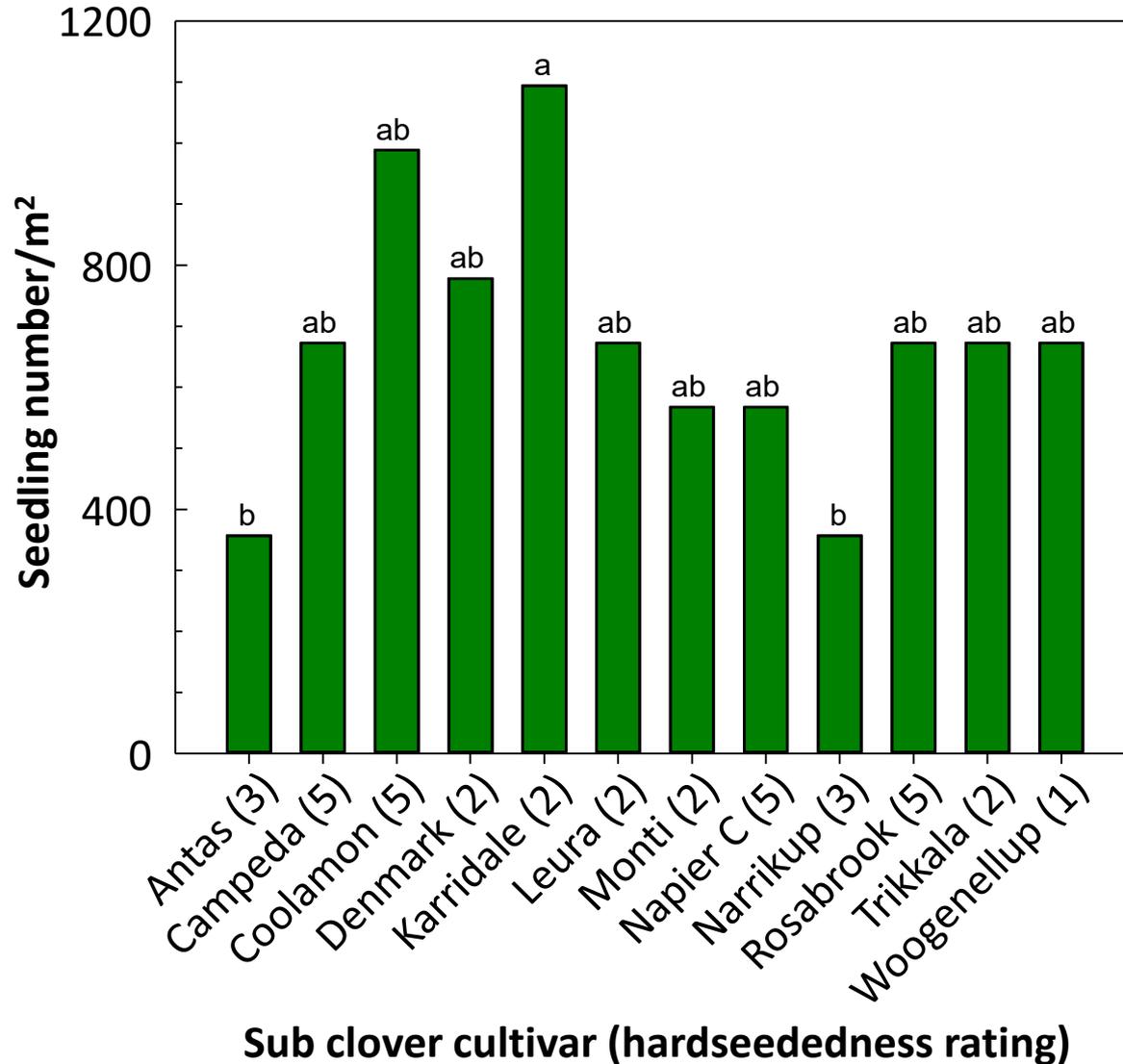
2017 dry matter yield

20th Oct

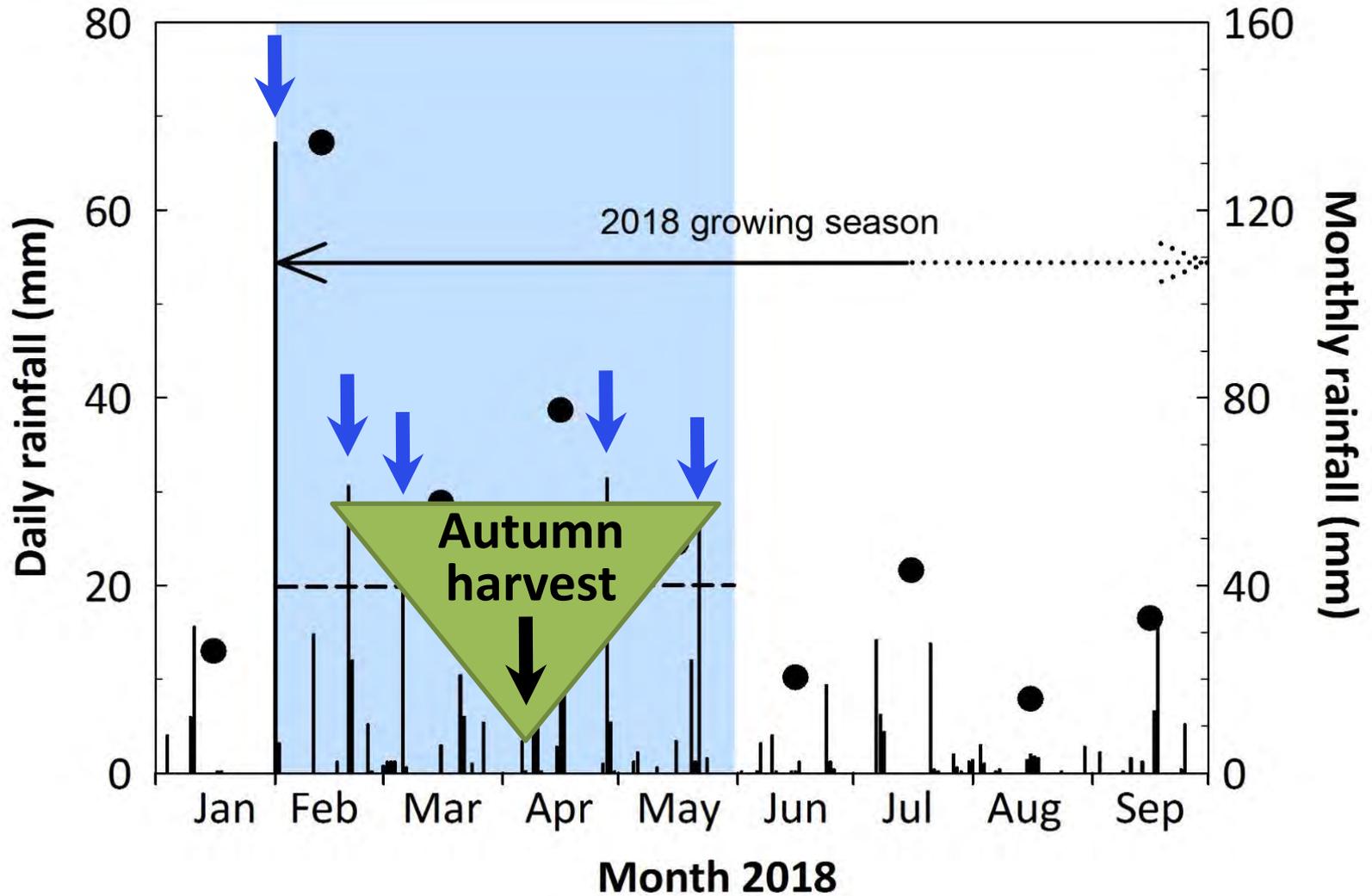


2018 re-establishment

23rd Feb

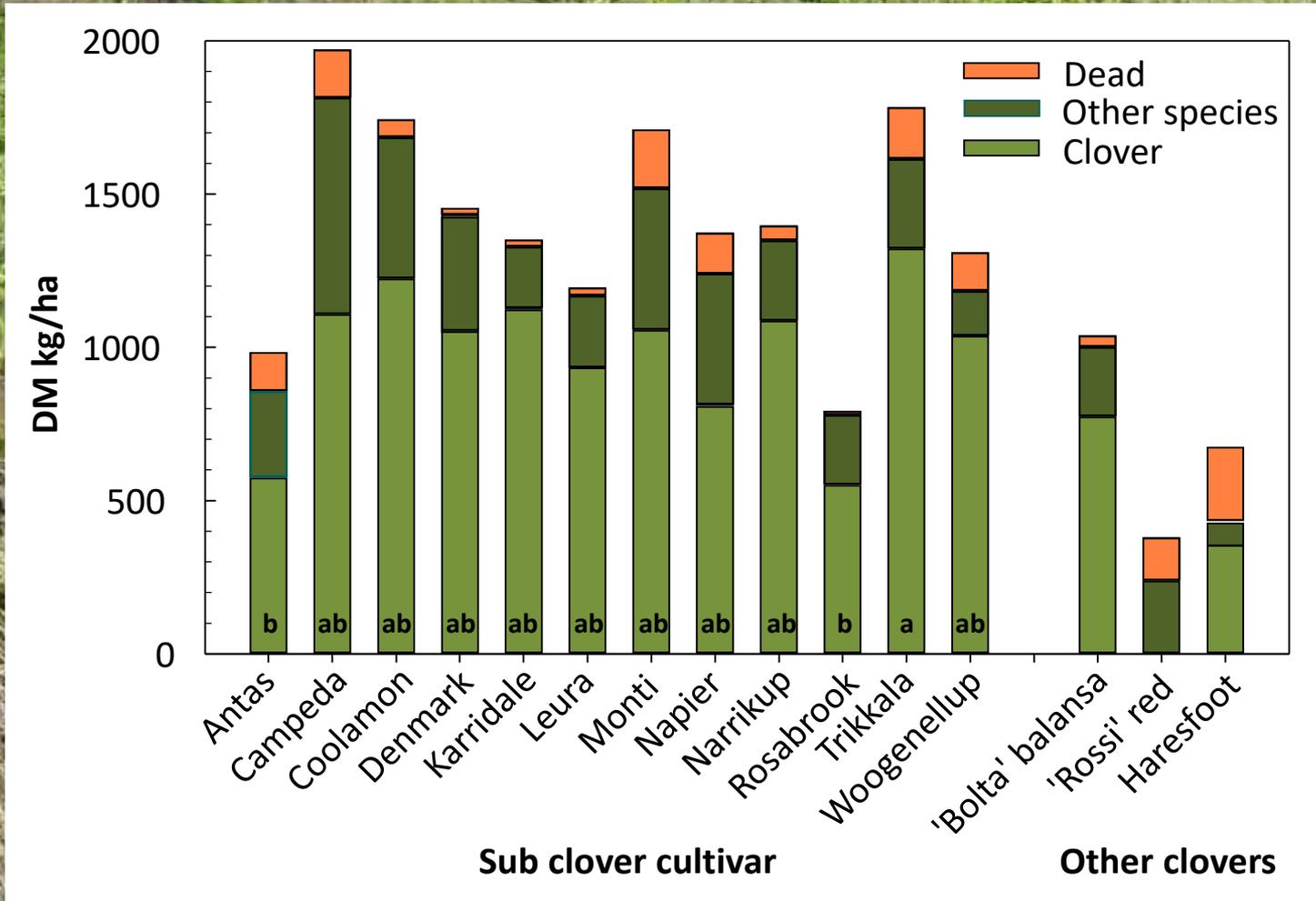


2018 rainfall: > 20+ mm events



2018 autumn clover yield

8th Apr



Conclusions

- ✿ Sub and balansa clovers were successful
- ✿ Winter leaf reddening did not affect spring yield
- ✿ Rainfall drives productivity
- ✿ Sub clover cultivars from *subterraneum* spp. performed best
- ✿ Mix of sub clover cultivars recommended



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It is associated with the following publication:

- **Olykan, S.T.**, Lucas, R.J., Teixeira, C.S., Subtil, R.A. and Moot, D.J. 2018. [Establishment, production and regeneration of subterranean clovers in the Mackenzie Basin, New Zealand.](#) *Journal of New Zealand Grasslands* **80**, 97-106.