

Relationships between total dry matter yield and height of dryland lucerne

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Photo: KM Pollock
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Introduction

- Destructive measures of yield are time consuming
- Non destructive methods must be reliable, repeatable & accurate
- Relationships between total yield and lucerne height evaluated for a dryland monoculture over six years

Pasture probe





Rising plate meter



Height stick

Materials & Methods

- 711 paired data points from 2009 to 2016
- Height and total yield from a 0.2 m² quadrat.
- Three quadrats from low, medium and high areas.
- ‘Stamina 6GT’ ~50% of samples
- 66% pre-graze samples from rotationally grazed area
- 101 samples post-graze residuals - analysed separately
- 142 samples from the SS and Semi SS treatments

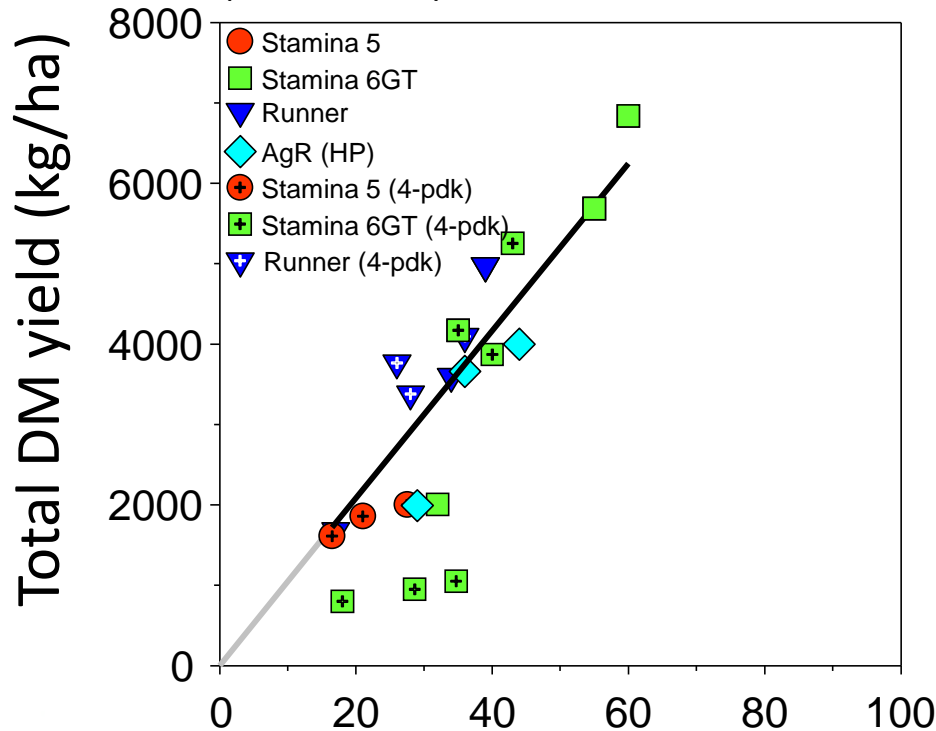
Results

- Average lucerne height (cm) explained 58% (adjusted R^2) of the observed variation in total DM yield ($n=468$)
- Inclusion of **Season** and **Year** as explanatory factors increased the adjusted R^2 to 0.78
- Data were recoded into 14 year/season combinations. The grouped linear regression had an R^2 of 0.84

Pre graze Results – Spring

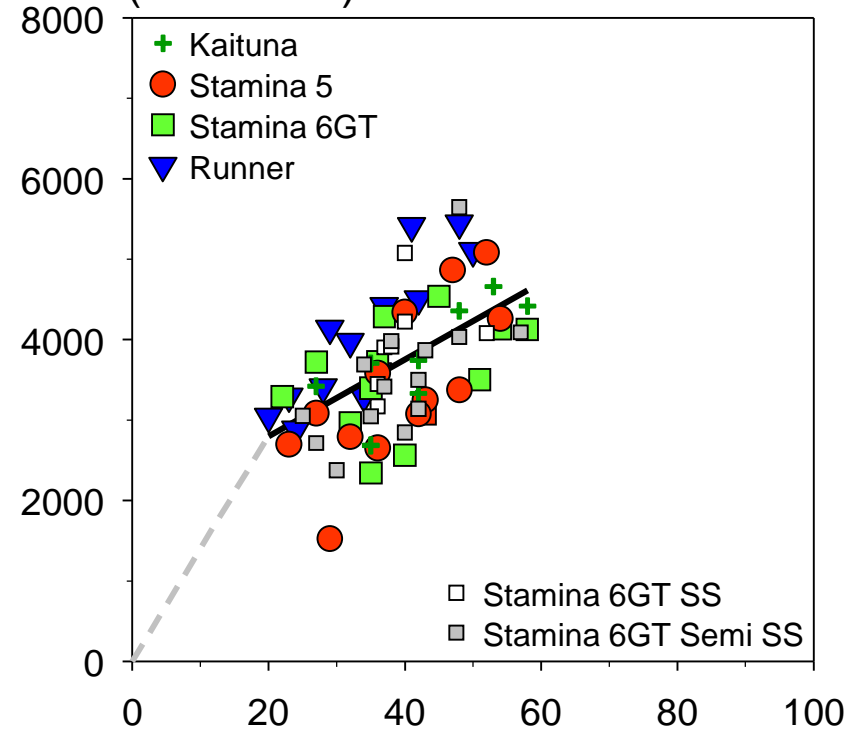
2009/10

Yield = 104x
(R² = 0.71)



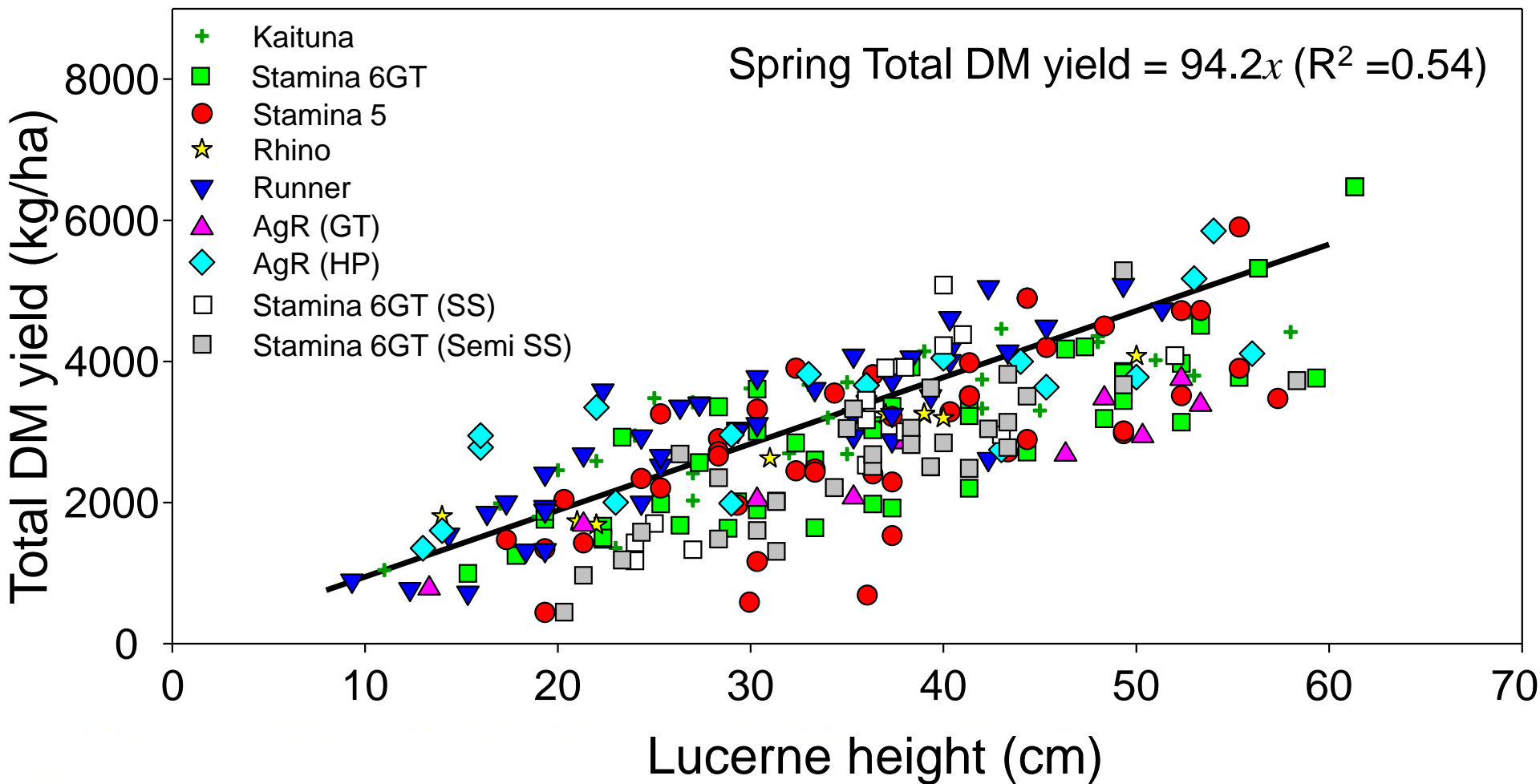
2013/14

Height >20 cm Yield = 1849 + 48x
(R² = 0.31)

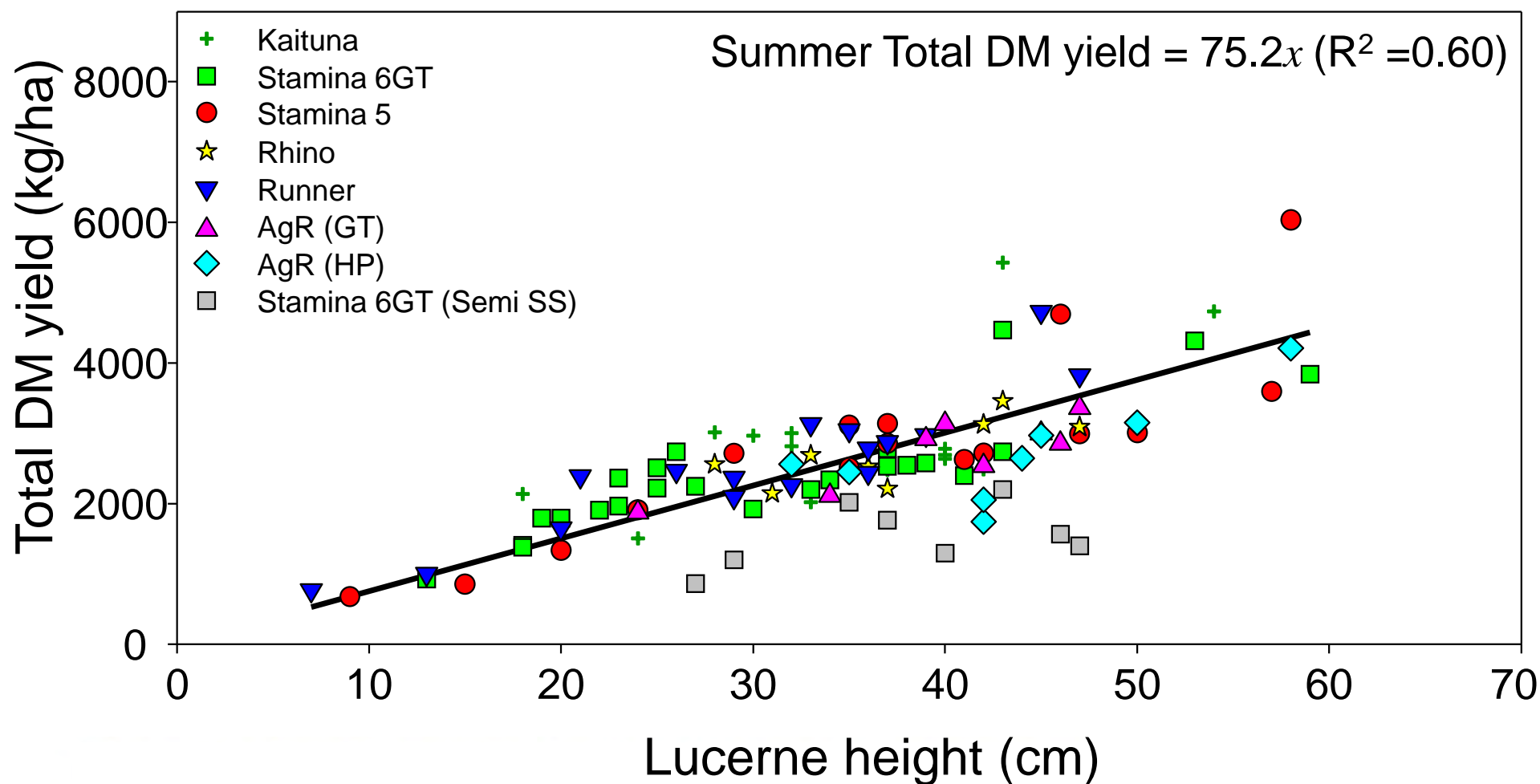


Lucerne height (cm)

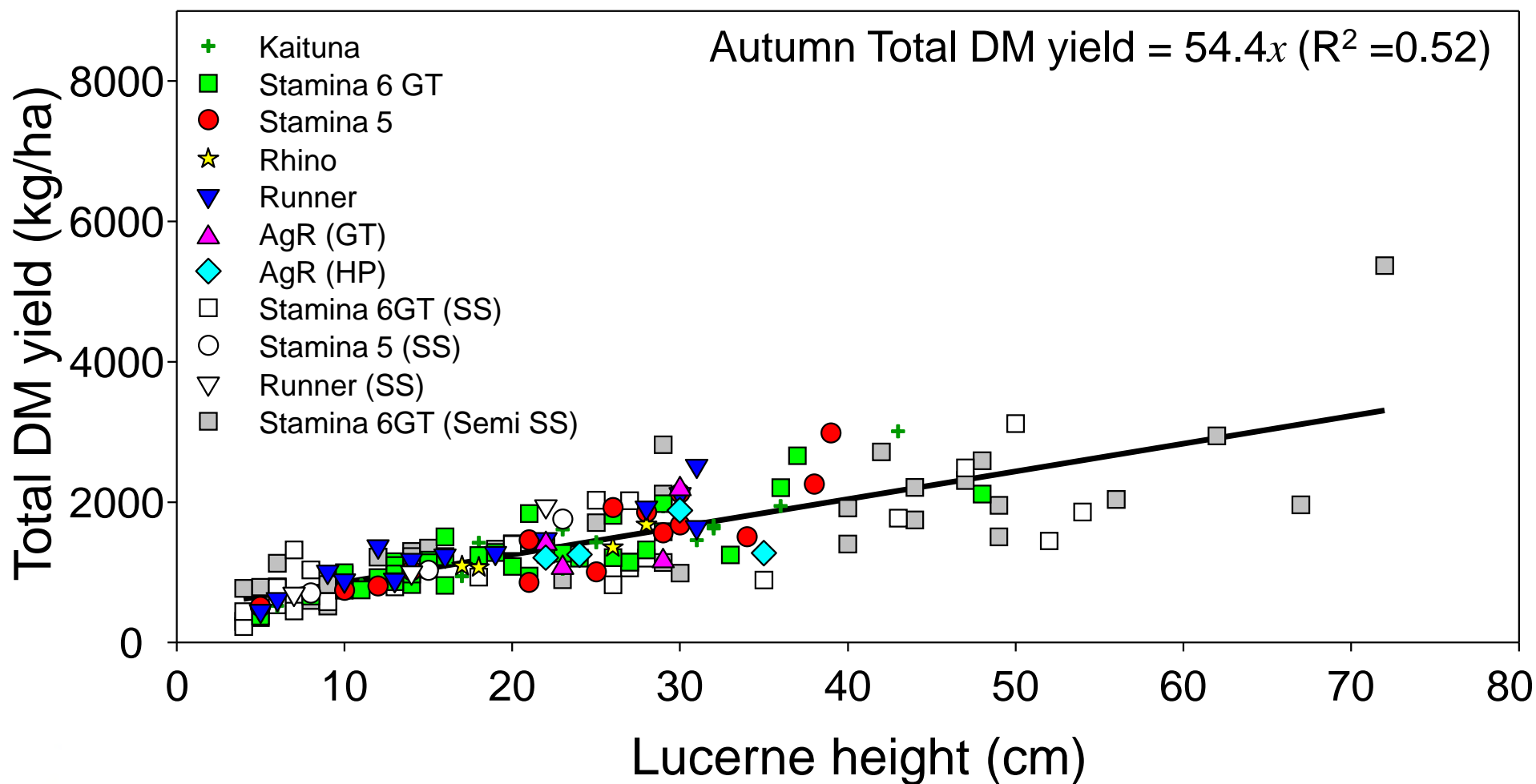
Spring



Summer



Autumn



Conclusions

- Incorporation of Year and Season into the model increased the overall amount of variation accounted for from 58% to 84%.
- For on-farm application lucerne yield can be estimated at
 - 95 kg DM/cm in spring,
 - 75 kg DM/cm in summer and
 - 55 kg DM/cm in autumn
 - there was considerable variation around these values.



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