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Yield, nutritional value and condensed tannin level changes in *Lespedeza cuneata* under different defoliation frequencies and intensities

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INTRODUCTION

A need exists for low cost pastures in the livestock industry

Lespedeza cuneata

- **Perennial legume, dry land**
- **Summer grazing, hay**
- **High tolerance – low pH and P in soils
– sandy soils?**

Low cost pasture/hay
Anthelmintic properties!

But lack of local information!





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OBJECTIVE

To determine the yield, nutritional value and condensed tannin level changes in *Lespedeza cuneata* under different defoliation frequencies and intensities

to develop management strategies for grazing, haymaking and exploitation of anthelmintic properties



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MATERIAL AND METHODS

Site: Dundee Research Station, KZN

Soil type : Hutton, 900mm, 20% clay.
Marginal potential – dry land cropping

Climate: Summer temp. 12.4°C - 26.1°C
Harsh cold winters with frost

Summer rainfall
LTA rainfall 783 mm a⁻¹



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Establishment:

Planted in February 2011, AU Lotan

Fine seedbed, Seeding rate: 15 kg ha⁻¹

Cut hay 2011/2012 season

Treatments:

6, 8 and 12 week defoliation frequencies
with cutting heights 5 and 15 cm.

Randomized block design

3 replications





Data collected for three years:

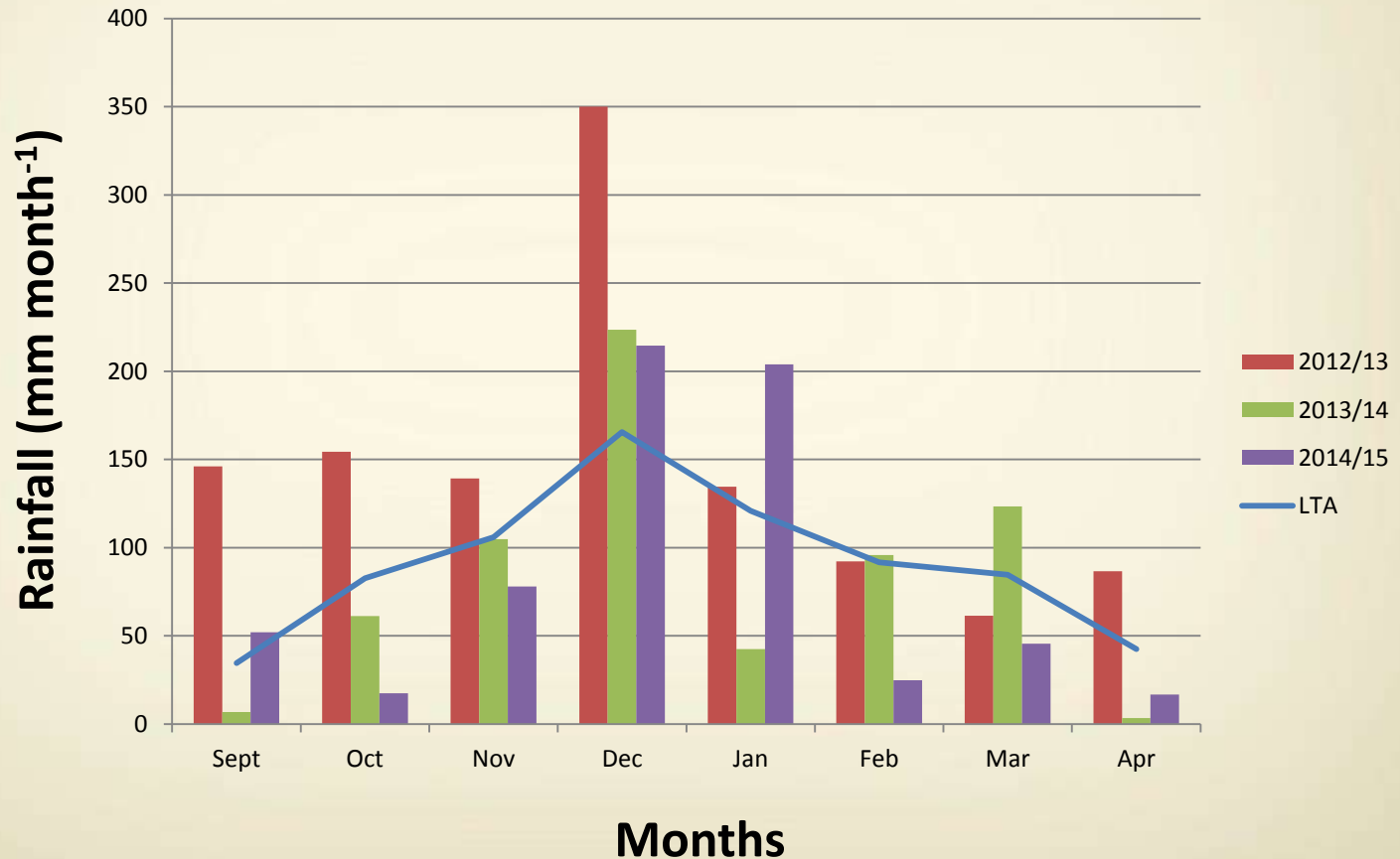
- Dry matter yield
- Feed Quality analysis
Full feed chemical analysis according to methods described by De Figueirero and Thurtell (1998)
- Condensed Tannins
Reed *et al.* (1982) and Waterman and Mole (1994)
-butanol-HCl
Samples were air dried (imitate haymaking conditions)



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Results and discussions

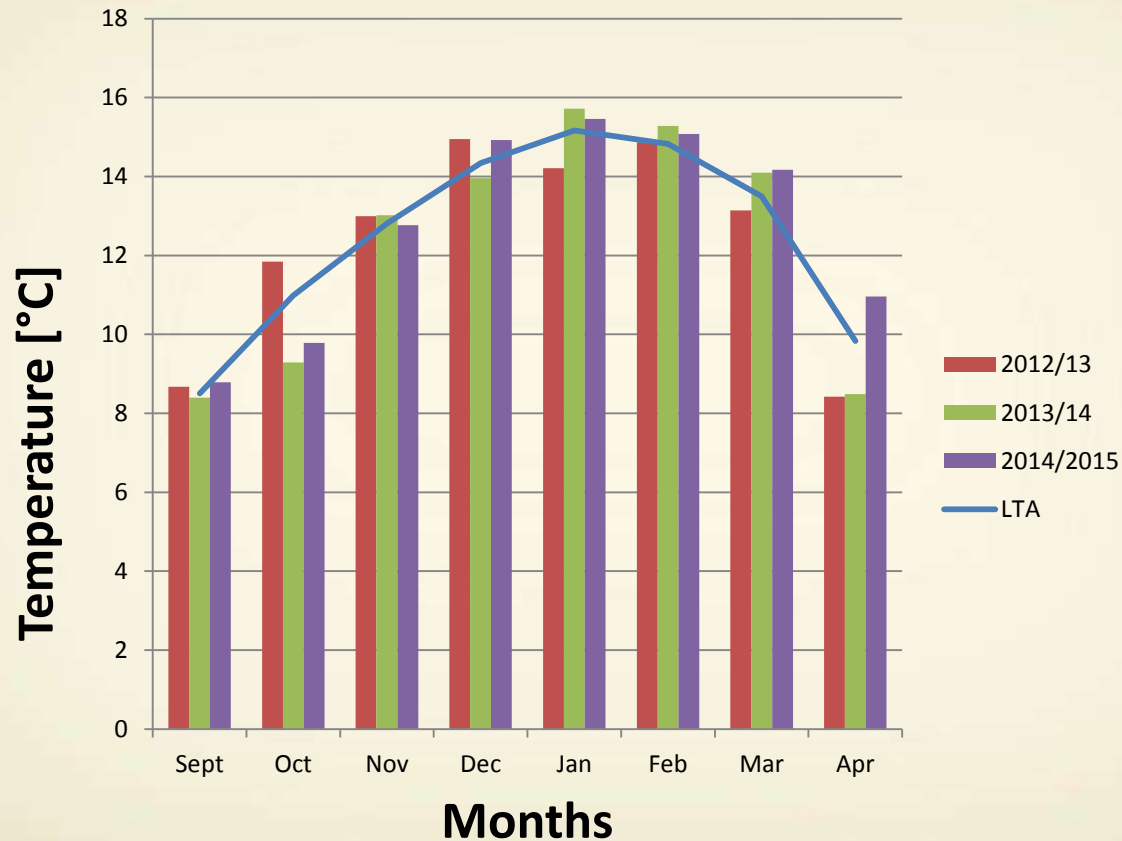


Monthly rainfall (mm month⁻¹) for Dundee Research Station

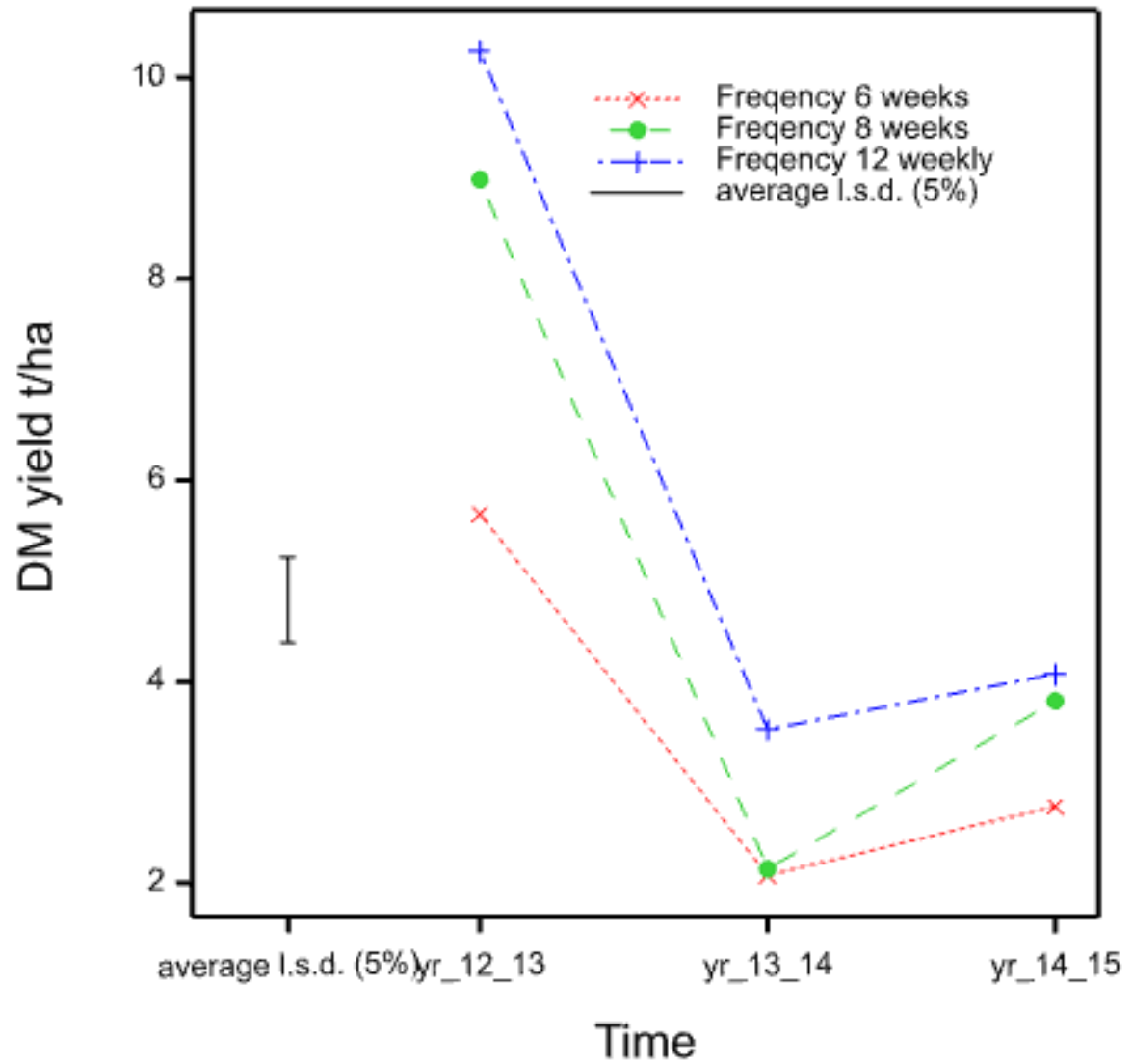


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Long-term monthly mean daily minimum temperature (°C) for Dundee Research Station





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Cutting height

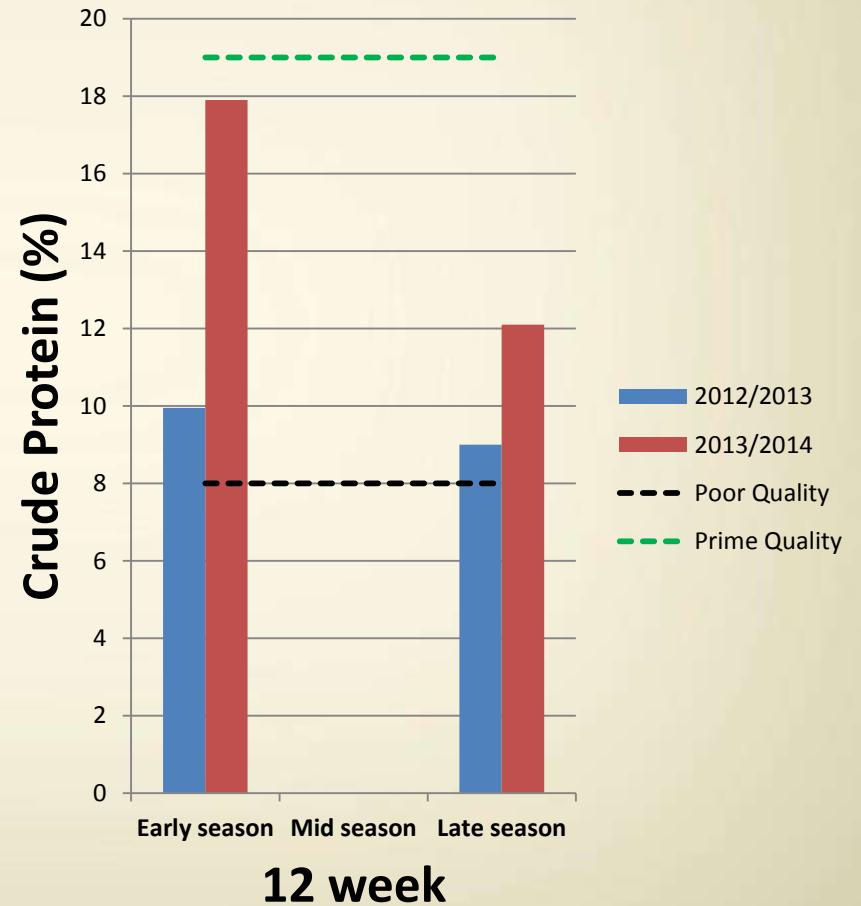
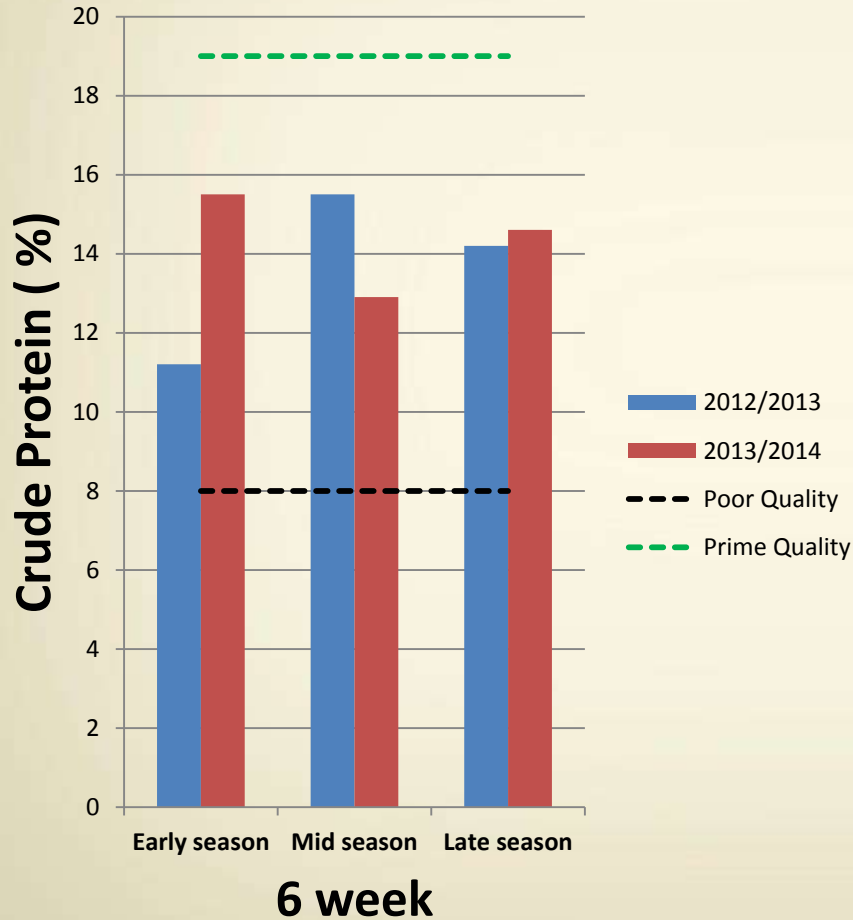
	Yields: 15 cm yield as % of 5 cm yield			
Cutting Frequency	2012/13	2013/14	2014/15	Accumulative total yield
6 Weeks	75.5	82.4	74.68	77.42
8 Weeks	66.5	59.8	76.4	72.3
12 Weeks	74.3	93	73.4	77.5



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Feed Quality CP%

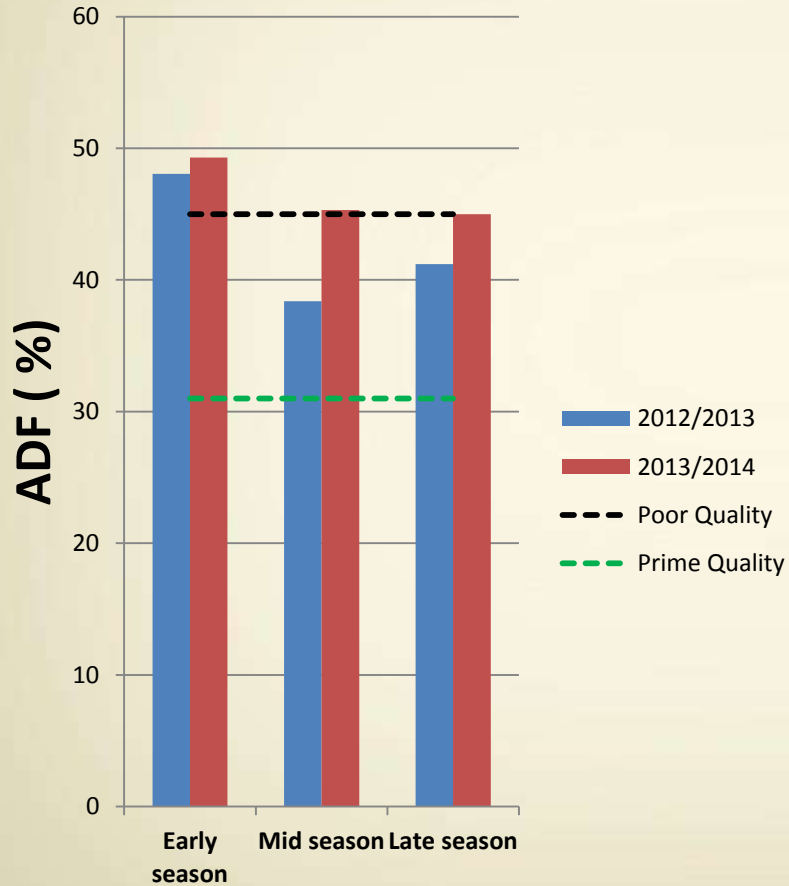




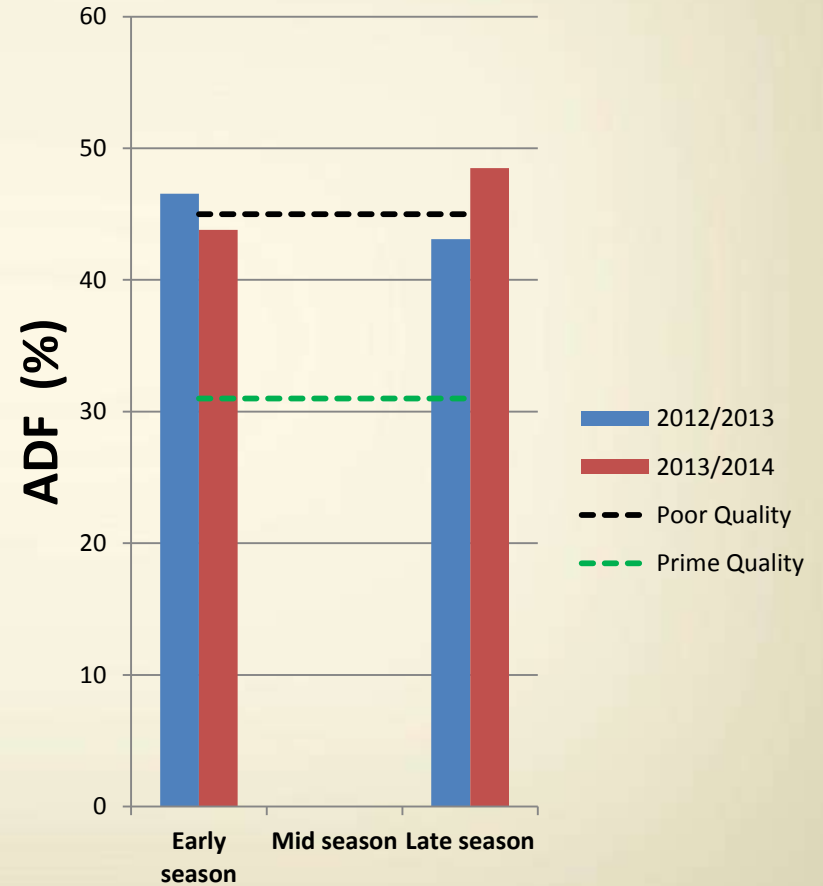
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ADF



6 week



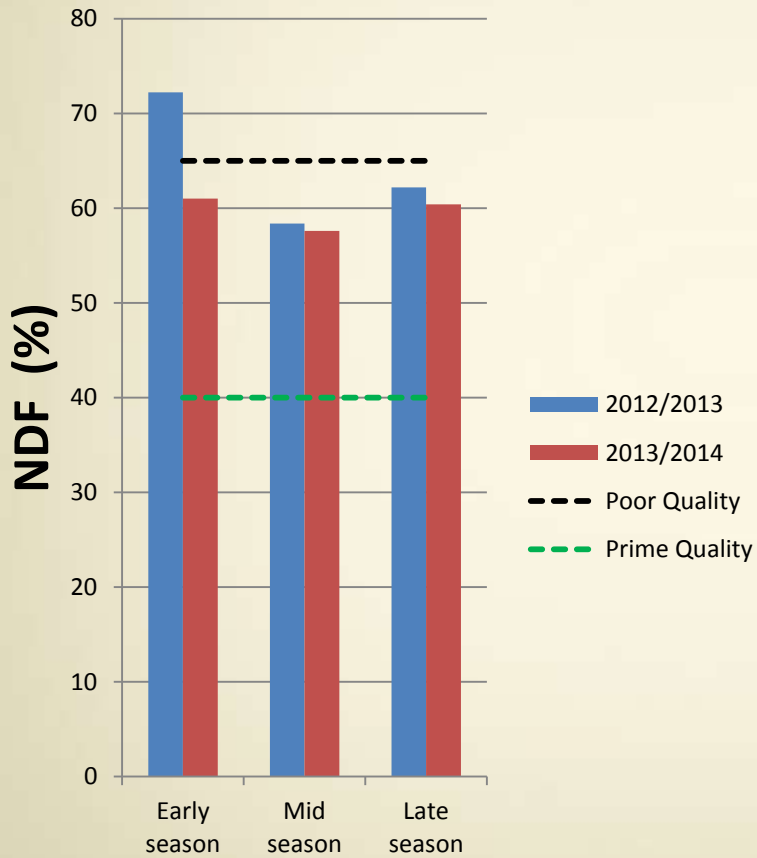
12 week



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NDF



6 week



12 week



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Cutting frequency	Leave: stem ratio
6 weeks	65 : 35
8 weeks	58 : 42
12 weeks	39 : 61





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Condensed Tannins (CT) - preliminary results

The CT content in this study: 24.5 and 122.5 g kg⁻¹ of DM
Literature: 46 and 152 g kg⁻¹ of DM

Effect of moisture stress on CT levels?

Rainfall 20 days back? influenced CT levels in plant?

Accumulative rainfall for a 5 day period – pentadel

Therefore, 4 pentadels back

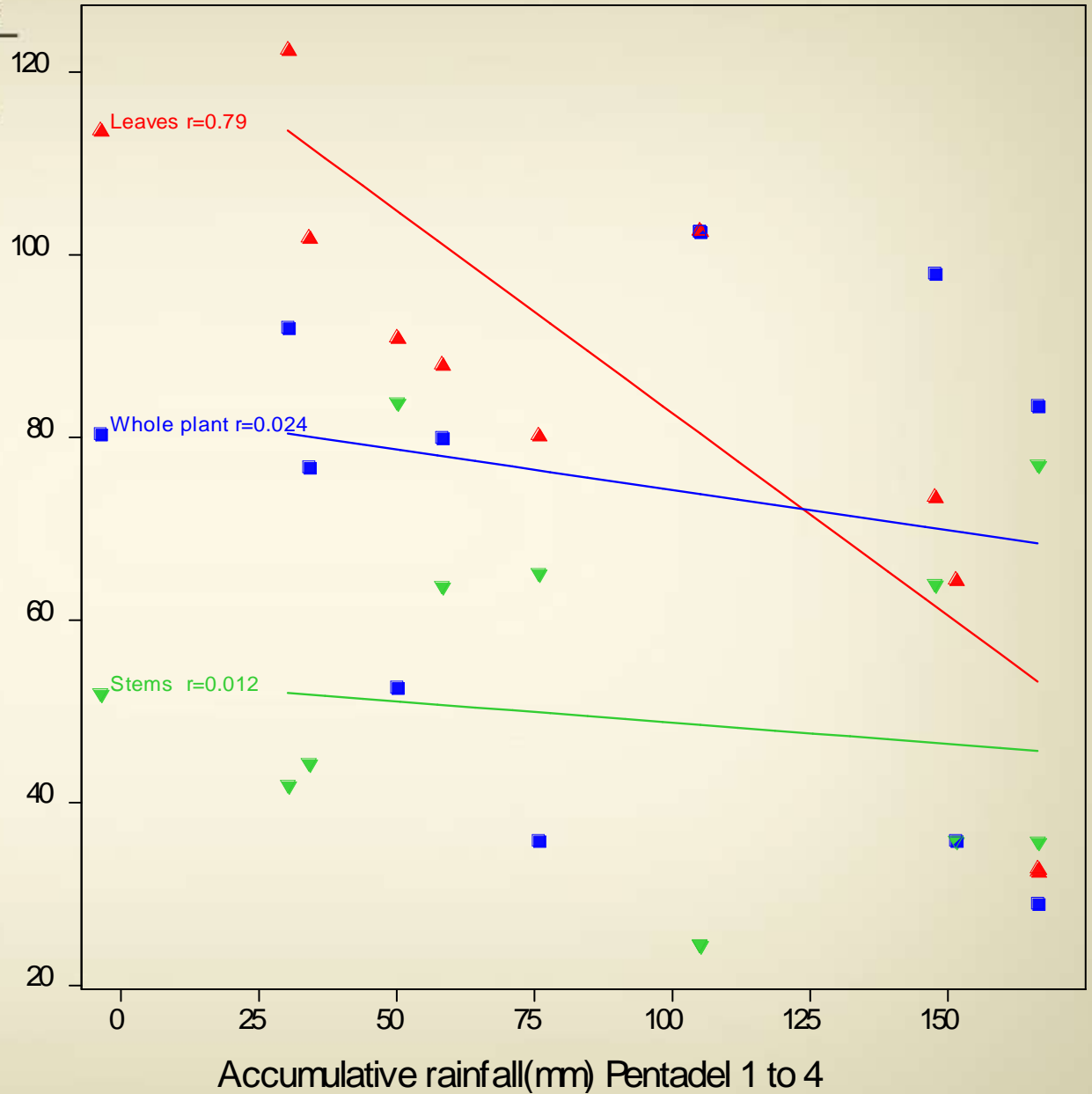
For CT analysis, used complete plant and then samples divided into leaves and stems



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Min and Hart (2003) and Hoste *et al.* (2006):

- High forage CT concentrations (>55 g CT kg^{-1} DM) may have negative effects, such as decreased voluntary feed intake.
- Moderate concentrations of CT (20- 40 g CT kg^{-1} DM) have positive effects in animal nutrition
- Slightly above moderate CT levels (45 - 55 g CT kg^{-1} DM): FEC's were reduced by minimum of 50% relative to non-CT containing forages.



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Conclusions

- **Spring rainfall - will determine the early season's regrowth.**
- ***L. cuneata*: huge potential as dryland pasture**
- **Utilize young for best quality**
- **Moisture stress increase CT level**
- **Withdraw livestock from grazing during times of moisture stress, to curb poor animal production. Graze during wet conditions –Worms!**
- **Not the perfect pasture, but a valuable pasture if managed correctly!!**



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Thank you