The effect of herbage conditioning and natural aeration methods on rate of moisture loss and crude protein content of *Lablab purpureus* herbage during hay-making

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Background

- About 70% of communal farming area are in NR IV and V, characterised by short wet season and frequent droughts.
- 79% of Zimbabwe is predominantly semi - arid (NR III-V) with soil of low WHC.
- Average land holdings in communal areas vary from 2.8 - 5.0 ha per HH depending on Natural Region.
- Agriculture is the main means of livelihood.
- *Lablab purpureus* - supplies high quality fodder - can be used as supplementary feed to animals on veld / fattening rations.

Justification

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- Severe and prolonged droughts reducing veld productivity - eroding the resilience and livelihood base of farmers.
- Commercial stockfeeds which could bridge this gap are out of reach for resource-challenged farmer.
- Lablab has a wide growth tolerance range.
- Adaptable for unpredictable weather conditions due to:-
  - deep tap-root
  - ability to reduce incident rays by leaf orientation

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Objectives

Goal: To demonstrate that home-grown forage legumes can be used in formulating dairy and beef-finishing rations in place of commercial supplements.

Specific objective:

To determine an effective technique to sun-cure late maturing *Lablab purpureus* cv. Rongai that is harvested for hay-making at early bloom

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Materials and methods

Experiment Design

- RCBD with factorial arrangement of treatments
  - 4 Conditioning Methods
    - Chopping to 15 -20 cm lenghts with Machete
    - Pressing with plain 200 ltr steel drum
    - Pressing with Wired 200 ltr drum
    - Unconditioned
  - 3 Drying structures
    - Raised platform
    - A-Framed rack
    - Dry ground
  - Replications = 5

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Results

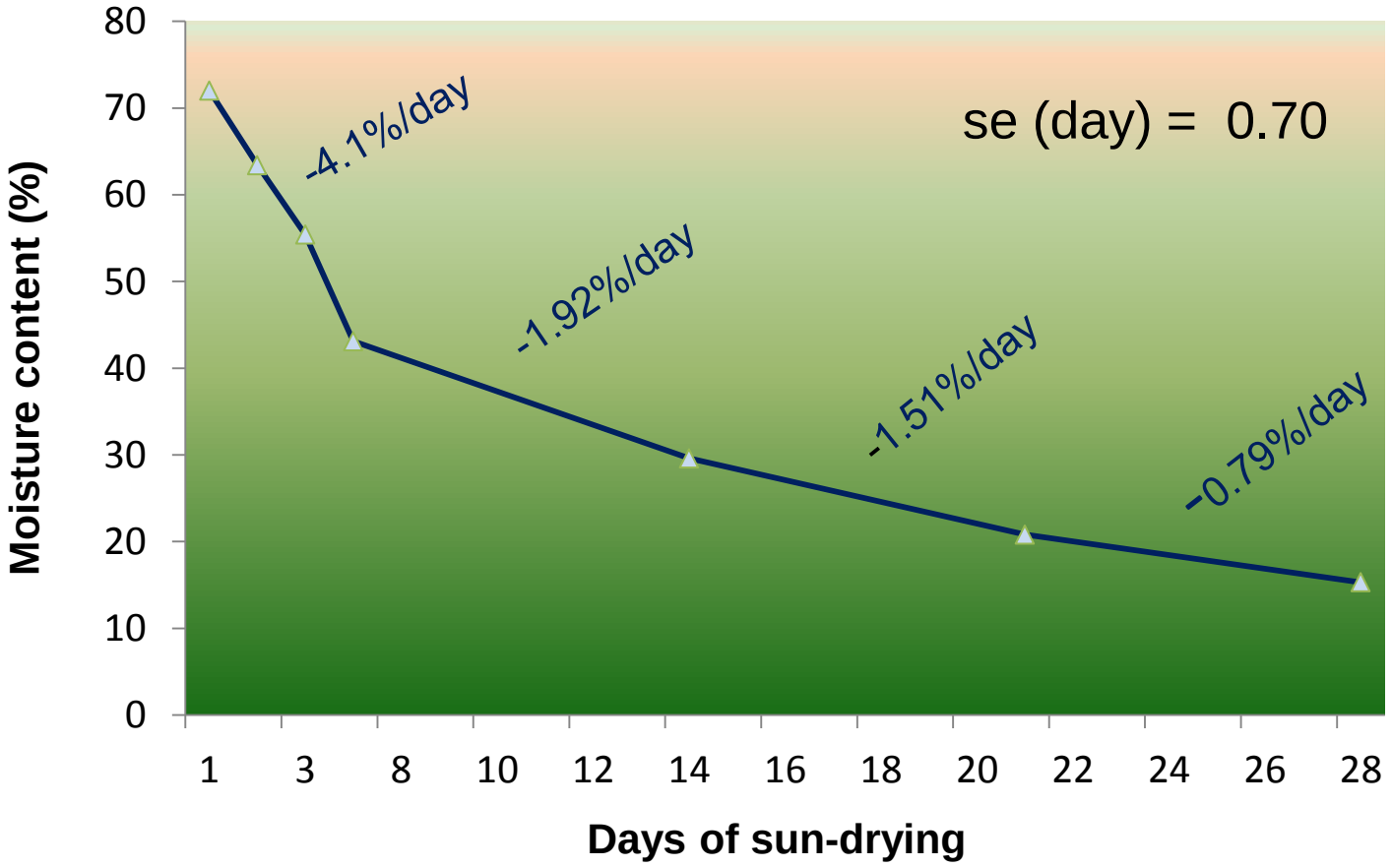

Figure 1. The effect of sun-drying on moisture loss of *Lablab purpureus* forage during hay-making

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Results (cont'd)

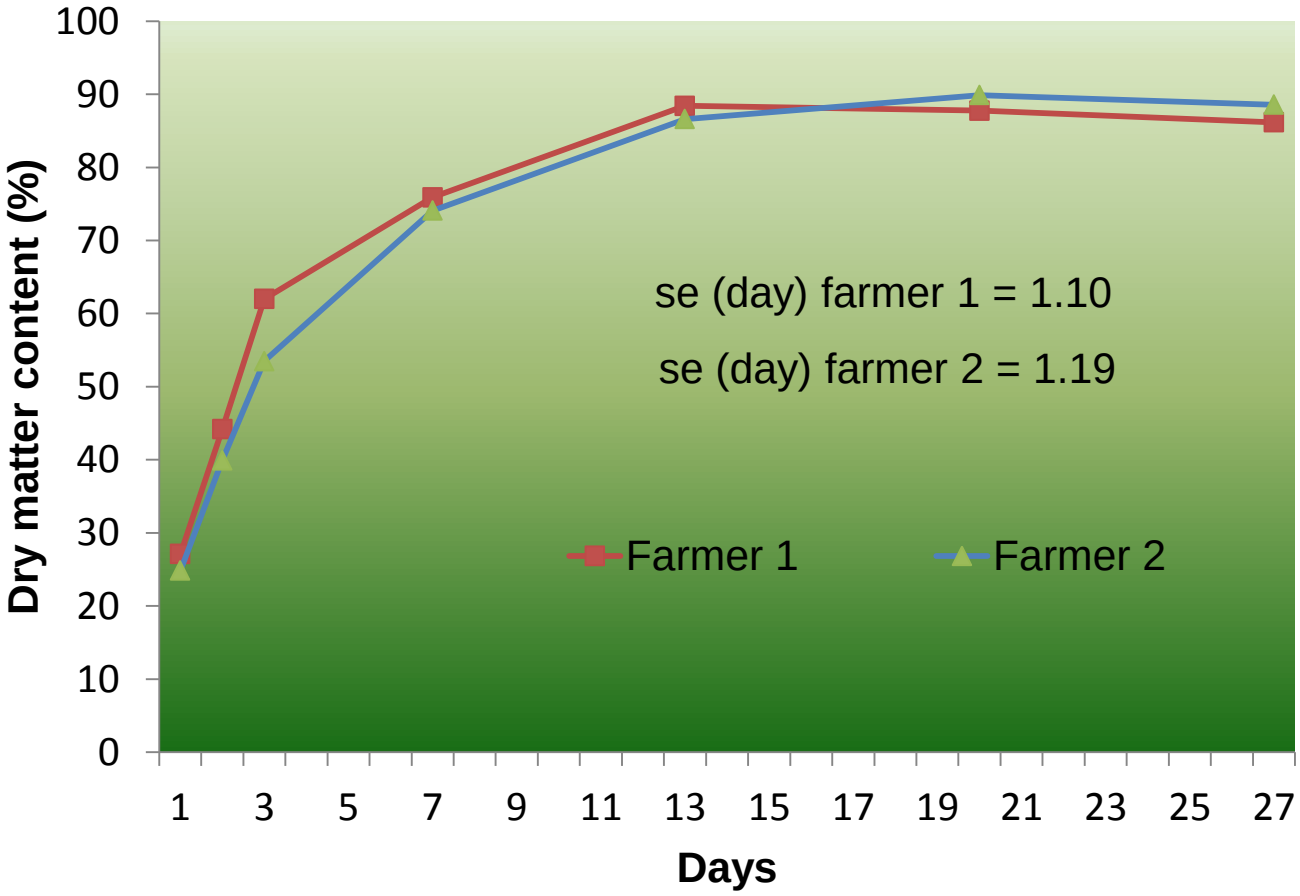

Figure 2: Rate of change in dry matter content (%) of Lablab leaves during sun drying.

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Results cont'd

- Prevailing weather conditions: Average day time temperature during drying = 24 degree celcius.
- Conditioning of forage was significantly ($P<0.01$) effective in improving drying rate
- Laceration and pressing was most effective.
- Aeration treatments did not have any significant effect ($P<0.05$).

Results (cont'd)

Table 1. Effect of conditioning method on drying rate of *Lablab purpureus* plant, plant components and whole plant crude protein (%) content

Conditioning method	28-day least square means for dry matter content (%)			Crude Protein content (%) (LS means for first 21 days of drying)
	Whole Plant	Leaf	Stem	
Wired Drum	59.4 [a]	68.5 [a]	54.6 [a]	8.69 [a]
Plain Drum	56.8 [ab]	66.0 [b]	52.0 [bc]	9.06 [a]
Machet	57.8 [ab]	66.1 [b]	53.5 [ab]	9.06 [a]
Un-conditioned	54.9 [c]	64.8 [b]	50.0 [c]	9.10 [a]

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Differences of LS means determined by Tukey mean seperation at P< .05

Conclusion and recommendations

- Forage conditioning is necessary to hasten moisture loss during hay-making with a full season's growth / mature *Lablab purpureus herbage.*
- Laceration, pressing and chopping are effective methods of conditioning..
- Placing the cut herbage on raised platforms is not effective in eccelerating the rate of drying and is even less effective than Laceration and pressing..
- Since conditioned leaves reach the desirable 20% DM content faster (8-9 days) than stems (25 days) under full sunshine, it is important to restrict handling (e.g turning) of hay once leaves are dry, to avoid leaf shutter.
- In dry weather conditions, conditioning and aeration will not affect crude protein content

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