Preliminary comparison on growth and biomass production of Leucaena , Sesbania and Indigofera

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Introduction

- Increase cattle population and the switch from traditional grazing system to more intensive raising system in Sumbawa will impact on the need of feed sources.
- More intensive system need more reliable feed source that cultivated and use as cattle feed.
- Sumbawa has longer dry season than rainy season, hence the need for feed that will keep available during the dry season is essential. In this regards, the use of tree legume is more valuable compare to grasses. The tree legumes keep producing biomass during dry season, its longer and deeper root system could utilize water deep in the soil
- Leucaena and Sesbania are tree legumes commonly cultivated in Sumbawa. Recently Indigofera was introduced as alternative tree legume for dry land (Herdiawan dan and Krisnan, 2014). It is interesting to find out the comparison of the growth between these tree legumes

Objectives

To collect preliminary information on the growth of Leucaena, Sesbania and Indigofera in dryland of Sumbawa

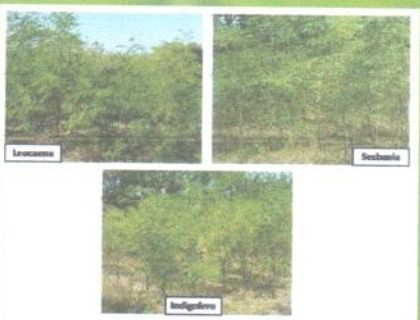

Plate 1. Indigofera, Sesbania and Indigofera.

Methods

- The seeds were prepared in polybags and let to grow for 5 months
- After 5 months, the seedlings were transplanted into the cleared land and allowed to grow and established during the season
- Plants height measured for 7 concecutive months after replanting
- After 12 months, forced cutting was applied and then the plants allowed to regrowth
- Two months after regrowing, the plants were harvested to measured the biomass production. The plant diameter were also measured at the time of cutting

Plate 2. The polybag seedling and tranplanted plants.

Findings

- Leucaena, Sesbania and Indigofera indicate good growing in the dryland of Sumbawa
- Leucaena, Sesbania and Indigofera showed similar growth during rainy season and early dry season as shown by plant height.
- At mid to peak of dry season Sesbania and Indigofera the grow of plant height slowing down but Leucaena keep growing well
- The height of Leucaena, Sesbania and Indigofera achieved 3.07m, 2.78m and 2.13m respectively

Plate 3. Plant height of Leucaena, Sesbania and Indigofera (cm).

Biomass production of Leucaena, Sesbania and Indigofera		
Plant species	Average dry and wet season (kgDM/tree)	P-value
Leucaena	0.32±0.04[b]	
Sesbania	0.18±0.05[c]	0.000
Indigofera	0.41±0.06[a]	

[abc] significant difference (P<0.05)

Biomass production of Leucaena, Sesbania and Indigofera during the season			
Plant species	Average dry season (kgDM/tree)	Average wet season (kgDM/tree)	P-value
Leucaena	0.29	0.36	0.084
Sesbania	0.15	0.20	0.500
Indigofera	0.40	0.42	0.824

Plate 4. Average biomass production of Leucaena, Sesbania and Indigofera during the season

More findings

- Indigofera produced highest biomass (0.41 kgDM/tree) compared to Leucaena (0.32 kgDM/tree) and Sesbania was the lowest (0.17 kgDM/tree)
- Preliminary finding for biomass production of Leucaena, Sesbania and Indigofera showed that production in dry season slightly lower compared to wet season and statistically no significant difference
- Regarding the diameter of the plant Sesbania showed the largest diameter followed by Leucaena and Indigofera
- Growth rate of Sesbania and Indigofera slowing just after the beginning of dry season while Leucaena continue growing until mid dry season before slowing down at the peak of dry season

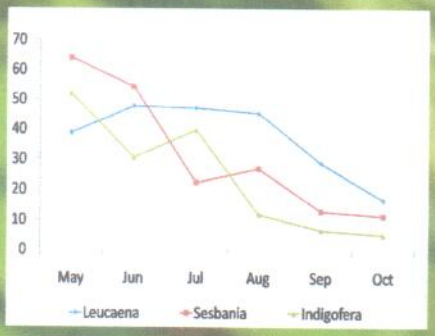

Plate 5. The growth rate of Leucaena, Sesbania and Indigofera (cm).

Conclusions

- Leucaena, Sesbania and Indigofera grow well in dryland of Sumbawa
- Indigofera produced highest biomass then followed by leucaena and Sesbania the lowest
- Leucaena, Sesbania and Indigofera produced biomass relatively constant during the season both in dry season and wet season
- Leucaena Sesbania and Indigofera could be used as feed source for dryland of Sumbawa
- Further research is needed, this preliminary data only shows the regrowth in first 6 months grow in one season. More frequent cutting

References

Iwan Herdiawan dan Krisnan R (2014). Produktivitas dan Pemanfaatan Tanaman Leguminosa Pohon *Indigofera zollingeriana pada Lahan Kering*. *WARTAZOA Vol. 24 No. 2 Th. 2014. p. 75-82*

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