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Integration of Sesbania and hybrid Cumbu Napier grass under intensive fodder production

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Abstract

Intensive fodder production in irrigated farming conditions is the order of the day for commercial dairy, sheep and goat farming. Considering the bio mass yield, palatability and optimal growth even after repeated harvesting like properties, Hybrid Cumbu Napier considered as best suited grass for this intensive fodder production. In those lines of advantages, hybrid Cumbu Napier grass especially varieties released by TNAU like CO-4 is highly popular among farming community (Ramya *et al.*, 2017). However, intensive fodder production with grass component alone poses the disadvantage of offering only grass fodder to the livestock. Considering that, like in common leguminous silvi pasture models (Cenchrus and Stylo spp.) incorporation of leguminous fodder tree as silvi component in intensive fodder production with grass component is always advantageous because of its dual benefits in offering grass and leguminous fodder for livestock. Based on that, a study was undertaken in Livestock Farm Complex, Veterinary College and Research Institute, Tirunelveli to study the bio mass and dry matter yield of silvi component (*Sesbania grandiflora*) incorporated intensive fodder production with hybrid Cumbu Napier grass.

Keywords: Silvi component, sesbania, CN grass, intercropping

Introduction

Agriculture in India faces a tremendous need for the food, feed fodder and other resources. There is a greater imbalance in the ecological basis because of indiscriminate use of resources. Diversification of land use with multiple component may a small solution for the ecological imbalance like climate changes, land degradation etc., India faces a critical imbalance in its natural resource base with about 18% human and 15% livestock population of the world being supported only on 2.4% geographical area, 1.5% forest and pasture lands and 4.2% water resources. Agriculture sector contributes about 15% national gross domestic product, employs 56% of the total workforce and supports about 58% of the total population (Mathukia *et al.* 2016) [2]. Thus, this sector is very vital not only to provide income support but also to ensure livelihood security for the majority of the people. Green fodder production throughout the year does not means only to produce or cultivate high yielding fodder variety but also maintain balance between these things like succulent fodder and dry fodder, but the production of protein rich and energy rich quality fodder. Hence to produce a quality rich fodder including the grass and legume fodder in the same piece of land satisfy the basic demand of nutrients of the animals and also the enriches the soil which leads to proper ecological balance by maintaining the microclimatic condition around the piece of land. This practice of integrating tree crop along with perennial fodder production increases the resource utilization efficiently and also increases the carbon sequestration. As per IPCC reports, agroforestry is one of the important tools to fight climate change and built resilience of farmers against threats of climate change and natural calamities because agroforestry gives services like microclimate moderation, biodiversity conservation, carbon sequestration, protecting water resources, soil erosion and pollution (Chavon *et al.* 2015) [1]. So, the following research was carried out to study the effect of integration of sesbania and hybrid cumbu Napier grass on crop biomass and drymatter yield.

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Materials and Methods

A plot size of 30 cents was identified with round the year irrigation facility, in which Hybrid Cumbu Napier (Co₄) was planted (stem cuttings) at 50 x 50 cm spacing. Along with the grass components 150 Nos. of *Sesbania grandiflora* (Agathi) tree seedlings were also planted in the sides of the water channels and around the plot as fence crop. Based on the soil testing results, the soil of the study plots is classified heavy clay loam type with pH of more than eight and rich in calcium carbonate. Standard agronomic practices were followed for a period of one year to study the biomass and dry matter yields of both the crops. A total of six harvests were undertaken for Hybrid Cumbu Napier grass (Co₄) and two tree lopping for *Sesbania grandiflora* in the study period of one year. Data on bio mass yield of each harvest and lopping were recorded and analyzed.

Results and Discussion

The bio mass and dry matter yield of Hybrid Cumbu Napier grass (Co₄) and *Sesbania grandiflora* were presented in Table 1. The total biomass yield of Hybrid Cumbu Napier (Co₄) in six harvests was 29.75 tonnes, there productivity of the same is 247.91 tonnes per hectare. The biomass yield of *Sesbania grandiflora* as an integrated and interlude crop was 2.44 tonnes. The dry matter yield of Hybrid Cumbu Napier grass (Co₄) and *Sesbania grandiflora* was 2.44 and 0.684 tonnes respectively. Based on the results of the study, *Sesbania grandiflora* as silvi component can very incorporated in intensive fodder production system with Hybrid Napier grass for its dual benefits of offering grass and leguminous fodder to livestock stock. It also has the advantage of improving soil fertility by growing leguminous tree as inter and border crop (Pradip Karmakar *et al.*, 2016)^[3].

Table 1: Bio mass and dry matter yield of fodder trees incorporated intensive Hybrid Cumbu Napier grass (Co₄) fodder production plot

Sl. No	Bio Mass yield (kg)		Dry matter yield (kg)	
	Hybrid Cumbu Napier (Co ₄)	<i>Sesbania grandiflora</i>	Hybrid Cumbu Napier (Co ₄)	<i>Sesbania grandiflora</i>
1	5250	1128	1155	315.84
2	4850		1067	
3	5100		1122	
4	4950	1316	1089	368.48
5	5100		1122	
6	4500		990	
Total	29750	2444	6545	684.32
Mean	4958.33 ± 107.56	1222 ± 4.00	1090.83 ± 23.66	342.16 ± 26.32
Yield t/ha	247.91	-	54.54	-

Conclusion

Incorporation of silvi component especially leguminous fodder trees in intensive grass fodder production will be always beneficial for livestock farmers in getting dual benefits like feeding grass and leguminous fodder. In addition to that, it also enrich the soil fertility through the nitrogen fixation properties and the systems is also water conserving in its farming perspectives.

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