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NOTE

Evaluation of Pasture Crops in Different Agroforestry Systems

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Abstract

The present investigation was carried out during 2007-08. Four agroforestry systems were carried out separately, namely neem, pongamia and simarouba based agroforestry system and tamarind based agroforestry system. The study was conducted in silvipastoral system with seven treatments such as *Stylozanthus scabra, Stylozanthus hamata,* anjan grass, and green panic, cowpea, sorghum and maize. The experiment was laid out in randomized complete block design with three replications. In neem based agroforestry system, pasture yield was significantly higher (12.20 t/ha) in *Stylozanthus hamata* followed by green panic (11.55 t/ha). Similarly, net returns (Rs 2,520 / ha) and B : C ratio were higher in *Stylozanthus hamata* as compared to rest of the treatments. In *Pongamia* based agroforestry system forage yield of *Stylozanthus hamata* was significantly higher (12.00 t/ha) followed by green panic (10.70 t/ha) as compared to other treatments. Similarly, net returns (Rs 2,150 t/ha) and B : C ratio (1.47) were also higher in *Stylozanthus hamata* as compared to other forage / pasture crops. In simarouba based agroforestry system forage yield of *Stylozanthus hamata* (12.7 t/ha) was significantly higher followed by green panic (12.00 t/ha) as compared to other treatments. Similarly, net return (Rs 2,900/ha) and benefit cost ratio (1.67) was higher in *Stylozanthus hamata* as compared to other pasture / forage crops. Whereas in tamarind based agroforestry system, *Stylozanthus hamata* recorded significantly higher forage yield (6.50 t/ha) followed by *Stylozanthus scabra* (5.50 t/ha) and green panic (5.5 t/ha). Similarly, net returns (Rs 2,200 / ha) and B : C ratio (1.51) was higher in *Stylozanthus hamata* compared to other forage crops. The addition the organic carbon and nutrient status of *Stylozanthus hamata* and *Stylozanthus scabra* were better as compared to other pasture crops.

Key words : Silvipastoral system, Fodder grasses, Yield, Net return.

In India grazing in forest has risen from 35 million ACU (adult cattle units) in 1958 to 60 million ACU in 1970, which further increased to 90 million ACU in 1990 (1). To bridge the gap between demand and supply of fodder, enrichment of these grasslands spread under tree canopy necessitates a concerted attempt. However, silvipasture systems are ideal combinations of grasses, legumes and trees for optimizing land productivity, soil and producing forage, timber and firewood on sustainable basis. Grasses conserve soil and

Table 1. Yield and economics of simarouba and tamarind based agroforestry systems.

	Simarouba based agroforestry system			Tamarind based agroforestry system		
Treatments	Total yield (t/ha)	Net return (Rs/ha)	B : C ratio	Total yield (t/ha)	Net return (Rs/ha)	B : C ratio
Stylozanthus hamata	12.70	29.00	1.67	6.50	2200	1.51
Stylozanthus scabra	11.50	1400	1.35	5.50	1620	1.40
Guinea grass slips	10.02	1200	1.30	5.12	1300	1.33
Green panic slips	12.00	2700	1.65	5.50	1010	1.24
Cowpea	06.50	1300	1.30	3.00	0700	1.16
Sorghum	04.50	1100	1.30	2.00	0900	1.22
Maize	07.00	1440	1.29	2.85	1,000	1.24
Mean	9.17	–	–	4.35	–	–
SE ±	0.16	–	–	0.11	–	–
CD at 5%	0.36	–	–	0.24	–	–

Table 2. Yield and economics of neem and pongamia based agroforestry systems.

Treatments	Neem based agroforestry system Total yield (t/ha)	Net return (Rs/ha)	B : C ratio	Pongamia based agroforestry system Total yield (t/ha)	Net return (Rs/ha)	B : C ratio
Stylozanthus hamata	12.20	2520	1.58	12.00	2150	1.47
Stylozanthus scabra	09.75	1900	1.47	9.50	1800	1.40
Guinea grass slips	08.50	1300	1.33	8.25	1300	1.33
Green panic slips	11.55	2350	1.57	10.70	1700	1.41
Cowpea	6.50	1770	1.41	5.50	0800	1.18
Sorghum	5.85	2200	1.55	5.50	1500	1.22
Maize	6.40	1950	1.47	6.00	1400	1.18
Mean	8.68	–	–	8.21	–	–
SE ±	0.08	–	–	0.17	–	–
CD at 5%	0.18	–	–	0.37	–	–

moisture. The legumes benefit soil by nitrogen fixation and in combination they help trees besides improving the forage quality. Most of the areas are characterized as poor, degraded and marginal lands having low fertility and productivity and depleting gradually to lack of proper management of these soils. Under such situation agroforestry is a better alternative system (2). Neem (*Azadirachata indica*), honge (*Pongamia pinnata*), simarouba (*Simarouba glauca*) and tamarind (*Tamarindus indica*) are the suitable tree components of an agroforestry.

The field investigation was carried out during the year 2007-08 at UAS, Bangalore and ARS, Chintamini. Four agroforestry systems were carried out separately namely : Neem, pongamia and simarouba based agroforestry system at GKVK and tamarind based agroforestry system in ARS, Chintamani. Geographically, the place is located at 12° 58′ N latitude, 77 °35′ E longitude and the altitude is 930 m above MSL. The experiment was conducted with seven treatments in a randomized completely block design with three replications, trees species were planted namely neem (5 m × 5 m), pongamia (5 m × 5 m), simarouba (5 m × 5 m), and tamarind (12 m × 12 m). The different pasture / forage crops such as *Stylozanthus scabra, Stylozanthus hamata,* anjan grass, green panic, cowpea, sorghum and maize were sown with the objective to assess the yield and economics of different forage crops under different agroforestry systems.

In simarouba based agroforestry system forage yield of *Stylozanthus hamata* (12.7 t/ha) was significantly higher followed by green panic (12.00 t/ha) as compared to other treatments. Similarly, net return (Rs 2, 900 / ha) and benefit : cost ratio (1.67) was higher in *Stylozanthus hamata* as compared to other pasturey forage crops. In Tamarind based agroforestry system, *Stylozanthus hamata* recorded significantly higher forage yield (6.50 t/ha) followed by *Stylozanthus scabra* (5.50 t/ha) and green panic (5.5 t/ha). Similarly, net returns (Rs 2, 200/ha) and B : C ratio (1.51) was higher in *Stylozanthus hamata* compared to other forage crops (Table 1).

In neem based agroforestry system, pasture yield was significantly higher (12.20 t/ha) in *Stylozanthus hamata* followed by green panic (11.55 t/ha). Similarly, net returns (Rs 2,520 ha) and B : C ratio were higher in *Stylozanthus hamata* as compared to rest of the treatments. In *Pongamia* based agroforestry system forage yield of *Stylozanthus hamata* was significantly higher (12.00 t/ha) followed by green panic (10.70 t/ha) as compared to other treatments. Similarly, net returns (Rs 2,150 t/ha) and B : C ratio (1.47) were also higher in *Stylozanthus hamata* as compared to other forage / pasture crops (Table 2).

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