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FIELD EXPERIMENT: FODDER MAIZE AND STYLO (1:1) INTERCROPPING IN ODISHA'S MID-CENTRAL TABLE LAND ZONE

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Abstract

Uterine torsion is a rare but serious condition in goats that can lead to maternal and fetal complications if not managed in a timely and appropriate manner. This case study presents a successful management of uterine torsion in a 2-year-old Kodi Aadu goat using the modified Schaffer's method. The doe had shown symptoms of abdominal straining and dullness, and upon examination, a post cervical right side torsion was diagnosed. The torsion was corrected using the modified Schaffer's method, and the doe was treated with various medicines and supportive therapies. A live female kid was delivered successfully by simple traction per-vaginally. The study suggests that the modified Schaffer's method could be used for correction of post-cervical uterine torsion in goats. The importance of timely intervention and appropriate treatment in managing uterine torsion to avoid maternal and fetal complications is highlighted.

Introduction

Maize is a crucial fodder cereal grown during the kharif season in India, either as a pure crop or intercropped with seasonal or perennial fodder to enrich its nutritive value. However, intercropping may provide enhanced production efficiency and better nutritional qualities for animals than the traditional system of feeding cereals or legumes in isolation. Stylo is a herbaceous, nutritive plant that is used as feed for all types of animals and has the potential to improve soil fertility and degraded land. India currently faces a net deficit of 61.1% green fodder, 21.9% dry crop residues, and 64% feed, with regional deficits being more significant than national ones. Therefore, the present study aimed to evaluate the effects of maize and stylo intercropping on fodder yield, economics, and post-harvest soil status. The study was conducted during the kharif seasons of 2015 and 2016 in sandhapal village, Odisha, using three treatments: sole maize, sole stylo, and maize+stylo (1:1) intercropping. The results showed that intercropping produced 27.4% higher green forage yield and maximum dry matter yield of 66.15 q ha-1, with significantly increased available nitrogen, phosphorus, and potash content. The study

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suggests that intercropping systems can increase fodder production and soil fertility, which can be beneficial in areas facing a deficit of green fodder production.

Materials and Methods

A field trial was conducted during *kharif* season of 2015 and 2016 in farmer's field at *Sandhapal* village (20° 50″37.2′ N, 84°57″9.3′ E) of Angul district in Odisha to assess fodder maize and stylo comprising three treatments *viz.* sole maize, sole stylo and maize+ stylo(1:1) intercropping. The average rainfall in both the year during the study period from June to December was 678.4 mm. The mean maximum and mean minimum temperature registered in both the year was 32.0° C and 16.0° C respectively. The soil of the experimental site was slightly acidic in reaction (pH-5.6), sandy loam in texture with medium in organic carbon (0.45 %), available nitrogen (176.6 kg ha^{-1}), potash (174.3 kg ha^{-1}) and low in phosphorus

(10.2 kg ha^{-1}) content[3]. The treatments comprised of different fodder cultivation practice *viz.* T_1- Farmers practice (sole maize), T_2- sole stylo, T_3- Maize+ stylo(1:1) intercropping were arranged in randomised block design with ten replications. Recommended package of practices were followed for raising fodder maize (J 1006) and stylo (*Stylosanthes scabra*). Both the crops were sown during 1st week of July and were applied with recommended dose of fertilizer for maize and stylo 80:40:40 and 20:50:30 kg N:P:K ha^{-1} respectively. The seeds were dibbled at a spacing of 30 cm between rows with a seed rate 50 kg ha^{-1} for maize and 5 kg ha^{-1} for stylo. First cutting of maize was taken at 70 DAP and first harvest in stylo was taken 3-4 months after sowing and subsequence harvest (4 nos) at 45 days intervals.

Final green fodder yields, fodder dry matter were recorded and productivity, profitability were calculated. Variations in organic carbon, available nitrogen, phosphorus and potassium were measured using standard soil analysis methods[3]. The data were statistically analyzed applying the techniques of analysis of variance and the significance of different sources of variations were tested by error mean square of Fisher Snedecor's 'F' test at probability level

0.05 [5].

Results and Discussion Green forage yield (GFY), dry Matter yield (DMY), production efficiency

In maize-stylo(1:1) intercropping the combined GFY was higher as compared to sole crop. Maize + stylo(1:1) intercropping produced 27.4% higher green forage (215.68 q ha^{-1}) than farmers practice of sole maize(Table 1). The sole crop of maize and stylo produced forage yield 169.28 q ha^{-1} and 232.09 q ha^{-1} respectively. This might be due to increase in protoplasmic constituents, cell enlargement and efficient urtilisation of nutrients[6]. The maximum DMY of 66.15 q ha^{-1} was obtained (Table 1) in maize + stylo(1:1) intercropping which was 19.4% and 13.4% higher than sole cropping of maize and stylo respectively may be due to more no of stylo rows contributing higher dry matter in the intercropping system[7]. The maximum production efficiency (83.89 kg ha^{-1} day^{-1}) was recorded in maize + stylo(1:1) intercropping followed by stylo sole. The lowest production efficiency (56.43 kg ha^{-1} day^{-1}) was found in sole maize cropping due to lower green fodder yield.

Table 1: Effect of treatment on GFY, DMY, production efficiency and post harvest soil status

Treatment	GFY (q ha^{-1})	DMY (q ha^{-1})	Production efficiency (kg ha^{-1} day^{-1})	Organic Carbon content (%)	Available nutrient status (kg ha^{-1})		
					N	P	K
Maize sole	169.28	55.40	56.43	0.42	170.83	10.16	172.44
Stylo sole	232.09	58.35	77.36	0.55	218.56	10.86	176.81
Maize + Stylo (1:1)	215.68	66.15	83.89	0.51	203.13	10.47	175.30
SEm +	1.16	0.24	0.39	0.002	0.84	0.04	0.58
CD(0.05)	3.44	0.70	0.56	0.007	2.49	0.11	1.72
Initial soil status				0.45	176.6	10.2	174.3

Post harvest soil fertility status

The post harvest soil status shows that stylo sole (Table 1) reported the maximum increase in available nitrogen, phosphorus and potash content, 23.8, 6.47 and 1.44 % respectively than the initial soil status might be due to inclusion of legume fodder crop in intercropping systems increased the available nitrogen of soil due to addition of nutrient by biologically Nfixation Maximum organic carbon build up(0.1%) was also obtained in the sole stylo [4]. stylo which is attributed to accumulation of root residues and shedding of leaves by the legumes[6]. Sole maize cropping has reduced soil fertility to 5.77 kg ha^{-1} N, 0.04 kg ha^{-1} P_2O_5 and 1.86 kg ha^{-1} K might be due to higher uptake and lower addition of nutrient in soil.

Economics

The maximum gross return (Rs. 50335.98 ha^{-1}), net return (Rs. 29978.03 ha^{-1}) and profitability (Rs.78.31 ha^{-1}day^{-1}) was obtained from maize + stylo (1:1) intercropping owing to its higher green fodder yield(Table 2). Maximum benefit cost ratio (2.71) ratio was recorded in stylo sole owing to its less cost of cultivation.

Table 2: Effect of treatment on cost of cultivation, gross return, net return, profitability and B:C ratio

Treatment	Cost of cultivation (Rs ha^{-1})	Gross return (Rs ha^{-1})	Net return (Rs ha^{-1})	Profitability (Rs.ha^{-1}day^{-1})	B:C ratio
Maize sole	22823.80	33855.27	11031.48	28.85	1.49
Stylo sole	17314.45	46418.66	29104.21	76.05	2.71
Maize + Stylo (1:1)	20357.95	50335.98	29978.03	78.31	2.48
SEm +	39.89	231.46	230.62	1.65	0.012
CD (0.05)	118.50	687.64	685.14	4.90	0.56

Conclusion

Thus, maize and stylo (1:1) intercropping fits well to the existing farming situation for its higher green forage yield, profitability and better soil fertility.

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