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Intercropping of Fodder Legumes in Sorghum

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ABSTRACT

Field experiment conducted to ascertain the effect of intercrops on sorghum revealed that higher grain as well as stover yield of sorghum CSH-5 was obtained when sown as 2 rows of sorghu 2 rows of cowpea at 30 cm apart with application of 40 kg P_2O_5/ha. as basal dose. The compara economics indicated that sorghum intercropped with 2 rows of forage cowpea recorded the highest ret It was also observed that higher gross income could be obtained in all the intercropping systems as c pared to sole sorghum.

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INTRODUCTION

High yielding varieties and hybrids released for general cultivation can respond to higher dose of Nitrogen and Phosphorus. However, farmers are not applying the recommended doses of these fertilizers and hence the production level in sorghum is affected in the state. For maintaining the yield data intercropping of fodder legume is the most beneficial as legume left soil richer in Nitrogen than pure sorghum after harvest. Waghmare (1980) reported residual effect of intercropping combinations having cowpea (Fodder) in rainfed conditions. There was a saving of Nitrogen due to fodder cowpea.

It is amply clear from the earlier studies that intercropping is feasible and economical in sorghum. Balasubramanian *et al.* (1982) observed that there were no significant differences between the treatments with regard to sorghum grain and stover yield and the comparative economics indicated that sorghum intercropped with 2 rows forage cowpea recorded the highest returns.

Nimbalkar and Dombale (1983) o served that if certain crops are intercropp with sorghum, the combined yield obtain may be higher from both crops without r ducing the yield of the main crop. Th further observed that sorghum intercroppe with udid gave the highest monetary retur as compared to sorghum alone. Howeve Nimbalkar and Shinde (1983) obtained th highest grain yield of sorghum when grow alone. But tur grown as an intercrop increa ed the monetary returns as compared t sorghum grown alone.

Intercropping of sorghum with legum and oilseed has become a profitable practic now a days. It is observed that the yiel recovery of many inter crops representing important pulse and oilseed has been increased (Singh 1979). Therefore an attempt was made to know the further agronomic aspects of

intercropping sorghum with cowpea, sunhemp and wal.

MATERIALS AND METHODS

A field experiment was conducted with 4 treatments (T_1 = Sorghum alone CSH-5, T_2 = Sorghum CSH-5 + Cowpea, T_3 = Sorghum CSH-5 + Sunhemp and T_4 = Sorghum CSH-5 + *Wal*) during 1983-84 to 1986-87 in RBD with 4 replications at the Main Sorghum Research Station, Gujarat Agricultural University, Athwa Farm, Surat. The crop was sown in 2 rows of sorghum : 2 rows of legumes at 30 cm apart. The sowing of the experiment was carried out in July during all the years. The basal dose of 40 kg P_2O_5/ha was applied to sorghum and the forage crops were uprooted and burried at the time of flowering. The data on grain and fodder yield of sorghum were pooled and their economics were workedout.

RESULTS AND DISCUSSION

The data on grain and stover yield for individual RBD analysis are presented in Table-1. It is revealed that treatments were

TABLE 1

Variances for grain and fodder yield in intercropping of fodder legumes. (Individual year)

ANOVA *Grain yield/stover yield.*

Individual year

Source	*d. f.*	*M.S.S.*			
		1983-84	*1984-85*	*1985-86*	*1987-88*
Repli.	3	48976.6	13299.5	55596.8	977.2
		4854.5	58788.8	238838.1	44396.7
Treat	3	13749.7	293304.0**	238212.4**	356663.5**
		125535.3**	606128.3**	3131906.1**	1362892.2**
Error	9	27476.5	8154.7	23439.8	10443.8
		31983.2	57479.2	113906.2	17581.3
Total	15	—	—		
S. Em. ±		82.88	45.15	76.55	51.09
		89.42	119.87	168.75	66.30
C. D. 5%		NS	144.44	244.88	163.46
		286.05	383.47	539.82	212.08
C. V. %		8.91	5.14	7.95	4.69
		4.04	6.46	6.60	2.60

Pooled

Source	d. f.	M.S.S. Grain yield	Stover yield
Repli./year	12	508057.18**	7114206.56**
Year	3	508057.18	7114206.56**
Treatment	3	710609.81**	4037609.06**
Year x Treat.	9	63773.28**	396284.25**
Pooled error	36	17378.69	55237.47
S. Em. ±		63.13	157.38
C. D. 5%		201.96	503.44
C. V. %		6.83	5.12

highly significant for grain yield except for the year 1983-84 whereas, treatments were highly significant for stover yield in all the years. Chi-square test showed that error variences were homogenous. Analysis of variences for pooled data revealed that years, treatments and years x treatments were highly significant for both grain and stover yield.

Economics of the grain and stover yield of sorghum based on four years data are presented in Table-2. The highest grain and stover yield was obtained in Sorghum + Cowpea treatment and the highest gross income also obtained when sorghum was intercropped with cowpea.

Singh (1979) has summarized the results of the experiment that cowpea not only proved good intercrop with sorghum for increasing the yield of sorghum but also improved the soil fertility and also improved the yielding potentiality of sequence crop. Further the effect of intercropping of cowpea in sorghum on production of ratoon sorghum were studies by Pawar and Thaval (1987) suggested that there was no difference in grain and fodder yield and grain to fodder ratio of sorghum ratoon due to residual effect of planting patterns, intercropping of cowpea in kharif sorghum and their interactions. In the present study further it was observed that the higher gross income could be obtained in all the intercropping systems than sorghum as a sole crop. Therefore it is advisable to intercrop sorghum with cowpea being more economical. These results are in agreement with the findings of Balasubramanian *et al.* (1982b), Nimbalkar and Dombale (1983). Thus intercropping of cowpea with sorghum proved beneficial in increasing yield of sorghum as well as good residual effect on next sequential crop.

Sr. No.	Treatments	Yield/ha. Grain	Yield/ha. Stover	Addi. yield over control Grain	Addi. yield over control Stover	Addi. income over control Grain	Addi. income over control Stover	Addi. cost over control	Gross income Rs./ha.	Addi. net return over control	Net C.B.R.
1.	Sole Sorghum (CSH-5)	1724	4034	—	—	—	—	—	5465	--	—
2.	Sorghum CSH-5 + Cowpea	2223	5254	499	1220	998	610	175	7073	1608	1:8=18
3.	Sorghum CSH-5 + Sunhamp	1849	4548	125	514	250	257	200	5972	507	1:1=53
4.	Sorghum CSH-5 + Wal	1912	4523	188	489	376	245	150	6085	620	1:3=13

Cost of cowpea Rs. 7=00/kg.

Cost of sunhamp Rs. 2=00/kg.

Cost of Wal Rs. 6=00/kg.

Selling rates :

Grain Sorghum Rs. 2=00/kg.

Stover Rs. 0=50/kg.

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