

Short Communication

Effect of Row Spacing of *Citrullus lanatus* L. on the Performance of *C. lanatus* – Sorghum Intercropping System

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Citrullus lanatus L., with its deep rooted system, utilizes soil moisture from lower depths and offers minimum competition to companion crops. In light textured soils of north Gujarat, farmers traditionally follow a mixed cropping system of sorghum+*C. lanatus* (GAU, 1987). In the present experiment, the spacing requirement of *C. lanatus*, when intercropped with fodder sorghum, was studied.

A field experiment with nine treatments comprising of four inter-row spacings of sole crop of *C. lanatus* (120, 180, 240 and 300 cm), with a common inter-row spacing of 45 cm, four corresponding row spacings of *C. lanatus* in intercropped system (*C. lanatus* in every 4th, 6th, 8th and 10th line of sorghum, with an intra-row spacing of 45 cm) and a sole sorghum with an inter-row spacing of 30 cm, was conducted on a loamy sand soil (Typic Ustipsamments) of Sardar Krushinagar in RBD, with four replications, from 1986 to 1992. The experiment got vitiated during 1987 because of severe drought and in 1992, due to high and intense rainfall. Sole crops of sorghum (cv. Malvan) and *C. lanatus* (cv. local) were fertilized with 80

kg N ha⁻¹ and 20 kg N ha⁻¹, respectively. Since in the intercropping system, *C. lanatus* is sown on the same line of sorghum, 80 kg N ha⁻¹ was applied to the intercropped system.

During the years 1988 (407.0 mm), 1989 (788.0 mm) and 1991 (288.4 mm), when the rainfall was favorable for sorghum crop, seed yield of *C. lanatus* was considerably reduced (Table 1) in the intercropped treatments as compared to sole *C. lanatus*, the per cent reduction being 43 to 76, 76 to 90 and 44 to 81 during the three years, respectively. During 1986, when there was drought, the yield of sorghum was reduced, but seed yield of *C. lanatus* was only marginally reduced, the per cent reduction being 28 to 46.

The crop equivalent in terms of sorghum fodder (Table 1) was distinctly higher in all the intercropped treatments as compared to sole sorghum in each year and also in the pooled years. The pooled data showed that sowing of *C. lanatus* in every 6th line of sorghum (T₇) gave the highest equivalent yield and was at par with that of sowing in every 4th, 8th or 10th line. Sowing

Table 1. Sorghum fodder, *C. lanatus* seed and pooled equivalent yield (kg ha^{-1}) under different treatments

Treatment	1986		1988		1989		1991		Mean yield		Pooled equivalent yield
	S	Cl	S	Cl	S	Cl	S	Cl	S	Cl	
<i>C. lanatus</i> Sole											
T ₁ : 120 x 45 cm	-	450	-	320	-	139	-	716	-	406	3046
T ₂ : 180 x 45 cm	-	434	-	285	-	143	-	829	-	423	3169
T ₃ : 240 x 45 cm	-	368	-	216	-	128	-	538	-	313	2342
T ₄ : 300 x 45 cm	-	357	-	210	-	87	-	647	647	325	2420
Sorghum sole											
T ₅ : 30 x 10 cm	3017	-	5346	-	6634	-	6239	-	5309	-	5308
<i>C. lanatus</i> in sorghum											
T ₆ : 4th line	2033	324 (28)	5488	78 (76)	7155	34 (76)	7076	214 (70)	5438	163	6408
T ₇ : 6th line	2739	234 (46)	6129	162 (43)	7832	23 (84)	6310	222 (73)	5753	160	6840
T ₈ : 8th line	3284	197 (46)	5968	83 (62)	5888	13 (90)	6275	300 (44)	5354	148	6474
T ₉ : 10th line	2353	378 (-)	5764	83 (60)	7002	17 (80)	6279	123 (81)	5350	150	6481
Rainfall (mm)			184.0		407.0		788.0		284.4		
Rainy days			12		10		26		20		

S : Sorghum, Cl : *Citrullus lanatus* L.

Note : Figures in the parentheses indicate per cent decrease in *C. lanatus* seed yield over respective sole.

of *C. lanatus* in every 6th line increased the crop equivalent by 33, 27, 17 and 17% over the sole sorghum during the years 1986, 1988, 1989 and 1991, respectively. However, Dudhatra *et al.* (1992) reported increased equivalent yield by sowing *C. lanatus* after every 4th line of sorghum.

The seed:pulp ratio of *C. lanatus* on an average was 1:30. This means that 332 kg ha^{-1} of mean seed yield for T₇ also gave 9.96 t ha^{-1} fresh fruit pulp which is relished by cattle. The soil moisture up to 30 cm depth in sole *C. lanatus*, sorghum + *C. lanatus* (mean of four spacing treatments) and sole sorghum was found to be 18.2, 12.3 and 13.6 mm at 45 DAS

and 13.8, 10.0 and 10.7 mm at harvest, respectively. Thus, soil moisture depletion in sorghum did not increase due to intercropping in plots of *C. lanatus*. This was due to moisture extraction from deeper layers of soil profile by *C. lanatus*. A slight but distinct increase in the soil moisture due to intercropping of *C. lanatus* may be attributed to its probable role of a live surface mulch at the maximum vegetative growth period.

Thus, the intercropping of *C. lanatus* in every 6th line of sorghum crop of 30 cm row spacing insulates the farmers' income when sorghum fails due to monsoon vagaries.

References

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