

## EFFECT OF INTERCULTURE ON PERFORMANCE OF PEARL MILLET UNDER RAINFED CONDITIONS.

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Pearl millet *Pennisetum americanum* (L.) is an important kharif crop of arid and semi-arid regions in India. Control of weeds is essential to harvest a good crop in arid and semi-arid tracts. Much work has been done on chemical control of weeds in pearl millet (Jain *et al.*, 1971; Pal and Kaushik; 1975; Malik *et al.*, 1980). But the only report available on the effect of interculture on weed control and production of pearl millet is that of Khan and Mathur (1961). In view of this, the present study was undertaken.

A field experiment was conducted during kharif cropping seasons of 1980, 1981 and 1982 at the Regional Research Station, Bawal of Haryana Agricultural University. The soil of the experimental field was loamy sand in texture, low in organic carbon (0.24%), medium in available phosphorus (14.5 kg P/ha), high in available potash (368 kg K/ha) and alkaline in reaction (pH 8.1).

Six interculture implements viz. traditional hand hoe, improved hand hoe, bullock drawn blade hoe wheel hand hoe, country plough and tractor drawn tiller comprised the six treatments in a randomised block design with four replications.

In each treatment, two interculture operations, with the respective implement, were carried out at 20 and 35 days after sowing in all the three seasons. The weed dry matter was recorded at harvest in quadrats of 50 x 50 cm selected randomly at three spots in each plot. Soil moisture at harvest was determined by gravimetric method from 0-30, 30-60, 60-90 and 90-120 cm soil depth. The total rainfall received during the growing season was 561.4, 362.4 and 213.7 mm during 1980, 1981 and 1982, respectively.

The higher grain yield in the year 1981 (Table 1) may be attributed to uniform distribution of rainfall throughout the growing season as compared to the years 1980 and 1982. The lower yields in the years 1980 and 1982 were due to moisture stress during the grain development and vegetative period, respectively.

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Table 1. Yield and yield attributes of pearl millet under various interculture treatments.

Treatments	Grain yield		(q/ha)	Effective tillers/m row			Ear length (cm)			1000-grain weight(g)			
	1980	1981		1982	1980	1981	1982	1980	1981	1982	1980	1981	1982
Traditional hand hoe	14.36	20.45	18.59	17.80	15.50	17.75	16.50	19.73	21.95	22.64	6.6	7.6	7.3
Improved hand hoe	15.46	21.19	19.55	18.71	15.75	18.00	16.75	20.35	22.03	22.80	6.7	7.6	7.4
Bullock drawn blade hoe	14.10	17.14	15.27	15.50	13.75	15.50	14.50	18.73	20.08	19.45	6.0	6.5	6.4
Wheel hand hoe	20.40	25.65	24.34	23.46	16.75	19.75	18.50	22.60	24.80	24.48	7.4	7.2	7.8
Country plough	19.54	24.56	23.07	22.39	16.00	19.25	18.00	22.20	24.45	23.75	7.3	8.1	1.7
Power tiller	11.10	15.80	14.14	13.68	12.50	14.00	13.00	20.00	20.08	20.78	6.4	7.2	6.6
SEM $\pm$	1.37	0.63	0.80	0.97	0.77	1.15	0.96	1.57	1.37	1.78	0.4	0.4	0.2
CD 5%	2.2	1.91	2.41	2.45	1.61	2.45	2.25	NS	2.97	3.73	0.9	0.8	0.5

Interculture with wheel hand hoe and country plough, which were at par, gave significantly higher grain yield of pearl millet over all other treatments during all the three years and in the pooled analysis (Table 1). The number of effective tillers, ear length and test weight of grain were also more in these treatment which resulted in increased grain yield. In the plots of interculture with wheel hand hoe and country plough, control of weeds was better and loss of moisture from soil was less due to creation of efficient soil mulch by these treatments (Table 2). The dry weight of weeds

Table 2 Weed dry weight and moisture content of soil profile at harvest under various treatments.

Treatment	Weed dry wt (kg/ha)			Mean moisture content (mm) upto 120 cm soil profile		
	1980	1981	1982	1980	1981	1982
Traditional hand hoe	94.0	84.5	88.0	49.5	59.6	53.4
Improved hand hoe	86.8	76.4	82.6	58.5	64.6	56.0
Bullock drawn blade hoe	116.0	103.0	105.0	39.0	46.2	40.4
Wheel hand hoe	53.2	39.2	42.0	65.0	78.6	70.2
Country plough	62.4	46.2	50.6	64.6	77.8	70.4
Power tiller	106.6	92.5	94.8	46.8	54.5	49.0
SEM $\pm$	4.0	3.8	3.4	-	-	-
CD 5%	12.7	12.0	10.7	-	-	-

was significantly reduced in the plots where wheel hand hoe and country plough were used as compared to other implements. The moisture content in 120 cm soil profile was also more in these plots due to soil mulch created by interculture. Khan and Mathur (1961) reported that interculture and weeding by hand hoe was significantly better than interculture with bullock drawn blade hoe. On an average, the grain yield by wheel hand hoe treatment was 31.24, 25.0, 51.0, 4.33 and 70.76 per cent higher than hand hoe, improved hand hoe, bullock drawn blade hoe, country plough and the power tiller respectively. Also, interculture and weeding by improved hand hoe and traditional hand hoe gave significantly higher grain yield over power tiller. The lower yield in power tiller was due to plant damage by moving tractor wheels.

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