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EVALUATION OF DIFFERENT SOIL MOISTURE CONSERVATION TECHNIQUES FOR HIGHER MOISTURE USE EFFICIENCY IN WHEAT (Triticum aestivum L.) UNDER RAINFED DIARALAND CONDITION

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Abstract: The diaraland are situated between the natural levies are subjected in undated for different periods, periodically eroded and formed by meandering, braiding and course changing of river. There is time gap scarcity for the land preparation and sowing of wheat because of very less time available between post Flood and sowing wheat under rainfed condition. Therefore, it is essential to conserve the residual moisture for better plant growth and yield. Keeping in view the above facts, eight different treatments comprising tillage and mulch were studied over years under saryu diara rainfed eco-System. Studies reveal that the maximum grain yield 6.134 q/ha and maximum moisture use efficiency (MUE) of 4.146 kg/ha-mm were obtained in the treatment land preparation by rotavating twice with power tiller each followed by planking and sowing behind country plough + application of dry grass mulches e 4q/ha, 21 days after sowing. This technique may increase the sustained wheat production in diaraland under soil moisture stress and drought condition.

Diaralands are defined as land situated between the natural levies of major river systems which get periodically eroded and formed due to meandering, braiding and coarse changing of the river. Characteristically diaralands are prove to floods during the mousoon and moisture stress during pre and post flood periods, as irrigation facility does not exist or neglegible in this areas. The winter and summer seasons crops are raised on residual moisture and very often moisture stress reduces crop yield because there is no assured irrigation (hardly 3-10% area is irrigated). Keeping in view the above facts, the present study was conducted to evaluate suitable soil moisture conservation techniques for obtaining higher yields.

MATERIALS AND METHODS:

The experiment was conducted in diaraland of saryu River under rainfed condition at village Maheshpur Katra (Gonda) for two successive years (1993-94). The experiment was laid out in randomised block design with three replications having plot size of 15x10m. The Experiment consists of eight treatments as follows:

T_1 = Land preparation by rotavating twice with power tiller each followed by Planking.
T_2 = Land preparation by three cross country plough each followed by planking.
T_3 = Land preparation by one mould board + two country plough each followed by Planking.
T_4 = Farmer's Practice (Two country plough) each followed by planking.
T_5 = T_1 + Dry grass mulching.
T_6 = T_2 + Dry grass mulching.
T_7 = T_3 + Dry grass mulching.
T_8 = T_4 + Dry grass mulching.

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The dry grass mulch was applied 21 D A S e 4 g/ha. The Soil of experimental site was sandy loam in texture having P^H 7.5, organic carbon 0.22% and available P_2O_5 and K_2O contents of 7.5 and 150.0 kg/ha respectiveIy. Wheat var. HP 1102 was sown in furrow behind country plough. Basal dose of NPK was applied e 60, 30 and 30 kg/ha respectively at the time of sowing. Various observations on soil, moisture and crop aspects were recorded.

RESULTS AND DISCUSSION

It is evident from table-1 that the grain yields are significantly influenced by different moisture conservation techniques. It reveals that the highest grain yield of 6.13 q/ha was obtained in treatment T_5. Higher grain yield was achieved in T_5 due to higher amount of moisture available for plant growth during moisture stress period as the moisture use efficiency (MUE) was recorded (4.108 kg/ha- mm) which was significantly higher than the other treatments. The minimum grain yield of 3.750 q/ha and moisture use efficiency of 3.111 kg/ha - mm was obtained in T_4 (farmer's own practice). The reason of poor yield is due to rapid loss of moisture in this treatment.

Table 1: Effect of different moisture conservation practices on grain yield and moisture efficiency of wheat Vor.HP 1102.

Treatment*	Grain yield q/ha			Moisture use efficiency Kg/ha-mm		
	1993	1994	Mean	1993	1994	Mean
T_1	4.340	4.403	4.371	3.450	3.526	3.488
T_2	4.180	4.162	4.171	3.350	3.401	3.480
T_3	4.065	4.113	4.089	3.300	3.397	3.348
T_4	3.725	3.775	3.750	3.080	3.132	3.111
T_5	6.243	6.025	6.134	4.240	4.053	4.146
T_6	5.071	4.912	4.991	3.900	3.851	3.850
T_7	5.292	5.129	5.210	3.940	3.869	3.900
T_8	4.450	4.331	4.390	3.680	3.552	3.605
CD at 5% level			1.326			0.124

* Details of treatments has been given under materials and methods.

CONCLUSION

It may be concluded that the treatment T_5 i.e. Land preparation by rotavating twice with power tiller each followed by planking + application of dry grass mulch 21 D A S is most suitable moisture conservation practice under diaraland rainfed condition for wheat. Further it can be stated that diaraland offers tremendous scope for improving the crop productivity using improved technology. However the problems and constraints in diaraland are location specific and more research and development efforts are required in future.

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