

MITIGATING THE ADVERSE EFFECT OF DROUGHT IN RAINFED BLACKGRAM

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Field experiments were conducted for three seasons under rainfed vertisols of Kovilpatti from 1981-82 to 1983-84 to evaluate the performance of blackgram under compartmental bunding, raised bed and ridges and furrows system with and without farm yard manure application at 10 tonnes/ha in mitigating the adverse effect of drought. These treatments were superimposed with foliar spraying of two percent solutions of DAP and Urea at the flowering phase. The results of pooled analyses revealed the superiority of foliar application of DAP or urea over water spray alone. Soil fertility was not influenced by the treatments, Farm yard manure application has significantly increased the soil moisture status.

Black gram, one of the major pulse crops in Tamil Nadu is grown in an area of about 50,000 ha. In the rainfed black soil tracts of southern districts of Tamil Nadu, it is grown in a considerable area during rabi season. Moisture availability is the major constraint which affects the crop yield under rainfed condition. Hence, the present investigation was initiated to evaluate the benefits due to different systems of raising the crop with and without farm yard manure superimposed with foliar spraying of DAP and Urea.

MATERIALS AND METHODS

The experiments were conducted at the Cotton and Millet Experiment Station, Kovilpatti during rabi seasons of 1981 - 82, 1982-83 and 1983-84. The experimental soil was deep clay loam with low available N (165 kg/ha)

and P (10 kg/ha) and high available K (430 kg/ha). The pH was neutral and the soil was free from salinity hazards. Blackgram var. Co. 3 was the test crop and the following were the treatments.

(1) SYSTEMS

- i) Compartmental bunding.
- ii) Raised bed
- iii) Ridges and furrows

(2) LEVELS OF FARM YARD MANURE

- i) No Farm Yard Manure
- ii) Farm Yard Manure at 10 tonnes/ha-

(3) FOLIAR SPRAY

- i) Water spray
- ii) Foliar application of 2% urea at flowering phase.

TABLE 1

Year	Total Rainfall (mm)	No. of Rainy days
1981-82	256.7	19
1982-83	267.3	21
1983-84	559.9	18

TABLE 2 Effect of treatments on grain yield, soil moisture and soil fertility (Pooled data)

Treatments	Grain Yield	100 Grain weight (g)	Soil Moisture (%)		Available NPK status of soil (kg/ha)		
			0-15 cm	15-30 cm	N	P	K
1. Water spray	847	47.9	25.30	25.50	149	6.2	422
2. Urea	904	47.1	25.30	25.50	134	6.5	401
3. DAP	955	47.3	25.10	25.50	131	6.3	404
C D	52	—	NS	NS	—	—	—
4. No F Y M	896	47.3	25.10	25.30	140	6.1	418
5. F Y M	909	47.6	25.40	25.60	136	6.6	400
C D	NS	—	0.29	0.20	—	—	—
6. Compartmental bunding	900	46.7	25.20	25.50	140	6.2	401
7. Raised bed	907	47.4	25.20	25.40	135	6.3	415
8. Ridges and Furrows	900	48.2	25.30	25.50	138	6.5	410
C D	NS	—	NS	NS	—	—	—
Control	632	45.7	25.6	25.8	120	5.9	378

iii) Foliar application of 2% DAP at flowering phase.

Thus there were 19 treatments (including one absolute control). Each treatment was replicated twice. All the treatments excepting absolute control received a uniform basal application of 20kg. N and 40kg. P₂O₅ / ha. Crop was sown with a spacing of 30 cm between plants. The quantum of rainfall received and the nu-

number of rainy days during the cropping period are furnished in Table 1.

Soil samples were collected at 10 days interval from 0-15 and 15-30 cm. depths and evaluated for moisture content. The crop was harvested at maturity and the yield data were recorded. Post harvest soil samples were analysed for their available NPK contents.

RESULTS AND DISCUSSION

The pooled data for three seasons for various parameters studied are presented in Table 2.

The grain yield was higher in all the treatments as compared to control. Since these plots received a common dose of N and P @ 20 : 40 kg/ha, there was an increase in grain yield and this increase was due to increased grain weight. Different systems of raising the crop had no significant effect on the grain yield. Similar trend of results in sorghum grain yield was reported from the experiments conducted at Kovilpatti (Anonymous, 1983) where compartmental bunding, broad beds and furrows had similar effect on soil moisture and grain yield. Since various systems of raising the crop studied did not differ in their effect on the soil moisture status there was no variation in the crop yield consequently

Application of farm yard manure had no favourable effect on the grain yield of blackgram eventhough an increase in the soil moisture status was observed. Though Rajagopal *et al.* (1970) reported the beneficial effects of compost manuring on the grain yield of blackgram, Singh *et al.* (1969) were of the opinion that application of farm yard manure did not confer any additional benefit on the yield of pea grains where NPK were supplied through inorganic source. In the present investigation also since the crop received a uniform dose of NP at 20:40 kg/ha there was no yield increase for the applied farm yard manure.

Foliar spraying of DAP on par with urea had a significant effect on the grain yield of blackgram as compared to water spraying alone. The beneficial effects of foliar spraying of nutrients have been well established and needs no emphasis. The same had been reported by several workers (Swaminathan, 1962; Gorde and Kibe, 1973; Bangal *et al.* 1982).

With regard to available NPK status of soil, the treatments studied had no significant influence. The residual effect of fertilisers and manures applied was not pronounced significantly on the post-harvest soil fertility.

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