

Suitability of greengram for sprinkler irrigated cropping system under red soils of Trichy district

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Sprinkler irrigation has become an economical irrigation method both in terms of water use efficiency and crop productivity. For an established sprinkler irrigated cropping system, it is essential to identify season wise crops and intercrops to be included in the cropping sequence. Greengram due to its increasing demand, shorter duration and lesser water requirement, can be accommodated at any stage of the sequence without dislocating other crops. Though it is a drought tolerant, requiring less input and care, irrigation and application of fertilizers *etc.* are essential to exploit the production potentiality of greengram. Ascertaining the proportion of influence of different crop production factors in enhancing the yield attributes and yield, sprinkler irrigation will open way for formulating future strategies.

Field investigations were conducted at Agricultural Engineering College and Research Institute, Kumular, Tamil Nadu, India using a popular greengram variety (KM-2) during *kharif* 2001 and summer 2002 to find out the influence of sprinkler irrigation on yield of greengram and to study the economics of irrigation methods and production inputs. The soil was sandy loam in texture, pH 8.2, EC-0.30 dsm⁻¹, OC-0.6% and Bulk Density 1.45 g.CC⁻¹. Experiments were laid out in split plot design and replicated thrice. Treatments consisted of two irrigation methods of main plots (I₁ - sprinkler irrigation and I₂ - Flatbed system); seven production inputs

in the subplots (P₁: with farmer's practice (no inputs) P₂: with lime @ 2t/ha + FYM 12.5 t/ha, P₃: P₂ + Herbicide pendimethalin @ 1.51 / ha, P₄: P₃ + Two sprays of 2% DAP, P₅ : P₄ + NAA spray (40 ppm) 2 times, P₆ : P₅ + Bio fertilizer application (seed treatment with 2 pockets each rhizobium + phosphobacteria) and P₇ : P₆ + inorganic fertilizer (25:50:0 NPK kg ha⁻¹). Seeds were sown by adopting a spacing of 30 cm x 10 cm and all the recommended package of practices were followed. Growth parameters such as root weight, yield parameters *viz.*, number pods plant⁻¹, seeds pod⁻¹ and grain yield were recorded as per the standard procedures.

Sprinkler irrigation to greengram influenced the root weight but not the yield attributes in both the seasons of the study. Production inputs had significant increase in number of pods per plant and number of seeds per pod. The grain yield of greengram was not favourably increased by irrigation methods (Table 1). Application of all inputs lime 2 t ha + FYM 12.5 t + herbicide pendimethalin @ 1.5 l + DAP 2% 2 spray + NAA 40 ppm @ 2 sprays + biofertilizers + 25:50:0 N:P₂O₅: K₂O kg per hectare (P₇) recorded higher grain yield of 444 kg per ha. which was on par with P₆. The results are in concurrence with Rajendran (1991), Vaithilingam *et al.* (1995) and Ravisankar *et al.* (2003).

Table 1. Methods of irrigation and input management on growth characters, yield attributes and yield of green gram - Kharif, 2001, Summer 2002.

Treatments	Root weight (mg) (2001)						Root weight (mg) (2002)					
	30 DAS	50 DAS	At harvest	No. of pods per plant	No. of seeds per pod	Grain yield (kg/ha)	30 DAS	50 DAS	At harvest	No. of pods per plant	No. of seeds per pod	Grain yield (kg/ha)
Main plot : Irrigation methods												
I ₁ - Sprinkler irrigation	26	91.4	100.0	17	11	379	25	73.1	90.0	18	11	389
I ₂ - Flatbed system	36	99.7	104.0	18	11	392	35	79.7	93.6	19	11	402
SEd	0.8	1.77	0.74	0.5	0.3	6	0.8	1.42	0.67	0.6	0.3	6
CD	3.7	7.63	3.18	NS	NS	NS	3.6	6.10	2.86	NS	NS	NS
Sub plot : Production inputs												
P ₁ - with farmer's practice	28	81.3	94.6	14	10	359	27	65.0	85.1	15	10	369
P ₂ - with lime at 2t/ha + FYM at 12.5 t/ha	30	87.2	98.8	16	11	368	29	69.7	88.9	17	11	378
P ₃ - P ₂ + Herbicide (1.5 l/ha pendimethalin)	32	91.3	98.5	18	11	374	31	73.0	88.6	19	11	384
P ₄ - P ₃ + Two sprays of DAP (2%)	32	94.5	101.7	17	11	379	31	75.6	91.5	18	11	389
P ₅ - P ₄ + NAA sprays (40 ppm) 2 times	31	99.2	103.0	18	12	389	30	79.3	92.7	19	12	399
P ₆ - P ₅ + Bio fertilizer	31	103.3	105.3	19	12	410	30	82.6	94.8	20	12	420
P ₇ - P ₆ + inorganic fertilizer (25:50:0 NPK Kg ha ⁻¹)	34	103.3	109.7	21	13	434	33	82.5	98.7	22	13	444
SEd	1.7	1.29	1.13	0.3	0.4	12	1.7	1.03	1.02	0.4	0.4	12
CD	NS	2.67	2.35	0.7	0.9	24	NS	2.40	2.12	0.8	0.9	24
Interaction effect												
P at I SEd	2.4	1.83	1.61	0.5	0.6	17	2.4	1.46	1.45	0.5	0.6	17
CD	NS	NS	NS	NS	NS	NS	NS	NS	2.98	NS	NS	NS
I at P SEd	2.4	1.66	1.66	0.6	0.6	17	2.4	1.96	1.49	0.6	0.6	17
CD	NS	NS	4.17	NS	NS	NS	NS	NS	3.75	NS	NS	NS

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