83

levels, application of 90 and 60 kg N and P_2O_5/ha yielded better and it was on par with 120 kg at N and 90 kg P_2O_5/ha. Nitrogen being a limiting nutrient on the soil of low available status, added nitrogen influenced the basic fertility status, added nitrogen influenced the basic fertility status which might have helped in increasing the production (Reddy *et al.*, 1985; Shelke *et al.*,(1988). Hence to get the maximum yield among the hybrids tested, the hybrid MSFH 17 with 90 kg nitrogen and 60 P_2O_5/ha is optimum. A good supply of P has been associated with root growth which might have absorbed plant nutrients and influenced the yield components. This is turn has significantly increased the yield.

Hundred seed weight

The hundred seed weight varied significantly among hybrids. The hybrids BSH 1 and IAHS 1 recorded 3.21 to 3.28 g weight where as MSFH 17 recorded 4.29 g to 6.16 g and KBSH 1 recorded 4.59 g and this is attributed to the large conversion of source accumulated in the sink with less number of seeds. Regarding fertilizer levels, there was no marked difference over this parameter studied (Table 2).

Oil content

The oil content estimated showed variation among hybrids. The hybrids IAHS 1 recorded maximum oil conte 39.8%). Different fertilizer levels had the oil content of hybrids. Fertilizer applic little impact in influencing the oil con sunflower, being a character determined by g means (Gopalasundaram, 1976).

REFERENCES

GOPALASUNDARAM,P. (1976). Studies on the mixed cropping of groundnut and sunflower in different proportions with split application of nitrogen under irrigated Condition. M.Sc. (Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore.

REDDY,N.S., REDDY,B.B., SUDHAKAR,M.V. and RAJU. (1985). Response of sunflower genotypes to time of nitrogen application. **J. Oil Seeds Res., 2** : 140 - 143.

SHELKE,V.B., SHINDE,V.V., DAHIPHALE and CHAVAN,D.A. (1988). Effect of levels of nitrogen, phosphorus and potassium on growth and yield of rabi sunflower. **J. Oil Seeds Res., 5** : 140 - 143.

SINGH,R.A., SINGH,O.P., SHARMA,H.C. and SINGH,M. (1977). Effect of levels of nitrogen and phosphorus on yield, oil content and moisture use pattern of rainfed winter sunflower. **Indian J.Agric.Sci., 47** : 96 - 99.

Madras Agric. J., 82(2): 83-85 February, 1995
https://doi.org/10.29321/MAJ.10.A01130

OVERHEAD IRRIGATION TO BLACK GRAM

S.SANTHANA BOSU, V.RAJAKRISHNAMOORTHY, V.K.DURAISAMY, M.AYYASWAMY and A.RAJAGOPAL.
Agricultural Research Station, Tamil Nadu Agricultural University, Bhavanisagar 638 451.

ABSTRACT

An experiment was conducted to evaluate the performance of overhead irrigation (sprinkler irrigation) to black gram in comparison with conventional surface irrigation in the Agricultural Research Station, Bhavanisagar during 1988 to 1989, The results indicated that irrigation black gram by sprinkler method at 0.5 IW/CPE ratio (2.5 cm depth of application) gave better yield and water use efficiency.

KEYWORDS : Sprinkler irrigation, Black gram.

Economic use of water for agriculture is the utmost necessity to bring more area under increased production. Sprinkler irrigation system is one of the water saving technologies which can be used for almost all crops and on most soils (Michael, 1989). To make an in depth study about the economics of water use, the cost factor and yield of crop, black gram was tested for the performance in sprinkler irrigation.

MATERIALS AND METHODS

Field experiments were conducted in three seasons *viz.*, Southwest monsoon (SWM), Summer (S) and North East Monsoon (NEM).

The details of the treatments were as follows:

T1 : 5.00 cm depth of water by surface irrigation at 1 IW/CPE ratio

Table 2. Influen (kg/ha) and WUE (kg/mm/ha) of black gram as influenced by sprinkler irrigation

Hybrids		SWM season		Summer season		NEM season		Mean	
		Yield	WUE	Yield	WUE	Yield	WUE	Yield	WUE
	1.00	1400	3.0	1276	2.2	1403	3.2	1360	2.8
BSH 1 : 1AHS1	kler 1.00	1400	3.00	1290	2.2	1487	3.4	1392	2.9
KBSH1 (K '97	nkler 0.75	1400	3.4	1240	2.8	1474	3.8	1371	3.3
MSFH 17	inkler 0.50	1500	4.1	1211	3.7	1505	4.4	1405	4.1
CD	sprinkler 0.25	800	2.6	912	4.6	1033	3.5	915	3.6
N & P_2O	CD	79.32		98.1		154.1	-		
N									

60 : 5.00 cm depth of water by sprinkler irrigation
at 1 IW/CPE ratio.

T3: 3.75 cm depth of water by sprinkler irrigation at 0.75 IW /CPE ratio

T4: 2.50 cm depth of water by sprinkler irrigation at 0.50 IW /CPE ratio

T5: 1.25 cm depth of water by sprinkler irrigation at 0.25 IW /CPE ratio

The experiment was conducted in randomised blocks design with six replications in SWM and S seasons and with four replications in NEM season. The soil was sandy loam. The aluminium quick jointing pipe lines with 150 model ST sprinkler heads were used for sprinkler spray. The standard cultivation practices were followed to study the effect of irrigation treatments on black gram.

RESULTS AND DISCUSSION

It is inferred (Table 1) that spraying 2.5 cm depth of water at 0.5 IW/CPE ratio recorded the highest WUE of 4.1 kg/mm/ha. When comparing this sprinkler treatment with that of the surface irrigation, a saving of 50 per cent (Table 2) of irrigation water was achieved. By using this, an additional area of one unit (i.e. 1 ha) of land can be brought under cultivation. By this extra irrigation, additionally 1405 kg of black gram grains can be produced with the same quantity of water used in

Table 2. Economic analysis of sprinkler system (for T4 as S2) with surface irrigation method (for T1 as S1)

Treatment	SWM season		Summer season		NEM season		Mean	
	S1	S2	S1	S2	S1	S2	S1	S2
Total quantity of water irrigation (mm)	200	100	500	250	200	100	450	225
Water saving in the sprinkler system over surface irrigation (in %)	-	50	-	50	-	50	-	50
Irrigation cropwater ratio	1:2		1:2		1:2		1:2	
Yield (in kgs/ha)	1400	1500	1276	1211	1403	1505	1360	1405
Value of the produce @ Rs. 4/kg	5600	6000	5104	4844	5612	6020	5440	5620
Cost of cultivation	2920	2436	3144	2548	2920	2436	2995	2473
Savings in cost of cultivation in the sprinkler sytem (in Rs.)	-	484	-	596	-	484	-	521
Yield (kg/unit of water used in terms of one ha of surface irrigation)	1400	3000	1276	2422	1403	3010	1360	2810
value of the produce/unit of water in terms of one ha of surface irrigation	5600	12000	5104	9688	5612	12040	5440	11240
Capital cost of sprinkler irrigation	-	1000	-	1000	-	1000	-	1000
Net profit *	2680	5128	1960	2592	2692	5168	2445	4294

* The cost of cultivation in the sprinkler irrigation for the additional area irrigated was also deducted from the value of the produce to arrive the net profit.

the surface irrigation schedule. Khade *et al.*, (1989) also reported that the mean seed yielf of green gram increased by 15.82 per cent and 33 per cent less water was used with the sprinkler method compared to check basin method.

An economic analysis was made on the average grain yield basis and furnished in Table 2.

The cost of cultivation in the sprinkler irrigation for the additional area irrigated was also deducted from the value of the product to arrive the net profit.

The irrigated crop area ratio was 1:2 between the surface and sprinkler irrigation.

$$\text{The irrigated crop area ratio} = \frac{\text{Area irrigated by sprinkler system by unit quantity water}}{\text{Area irrigated by surface irrigation by unit quantity of water.}}$$

The profit obtained in surface irrigation method was on an average Rs. 2445/- per ha whereas by using the same quantity of water, the profit obtained from 2 ha under sprinkler irrigation method was Rs. 4294/-. The profit ratio between surface and aprinkler irrigation system was 1:1.76.

$$\text{Profit ratio} = \frac{\text{Profit obtained from sprinkler irrigation by using unit quantity of water}}{\text{Profit obtained from surface irrigation by using unit quantity of water}}$$

This indicated whenever water is a constraint resource and land is available in excess with farmer, the sprinkler system can increase the profit by 76 per cent over surface irrigation. Hence, the irrigation schedule of 2.5 cm depth of spray at 0.5 IW/CPE ratio which was giving better yields and WUE was found to be optimum.

ACKNOWLEDGEMENT

The authors are grateful to the Central Board for Irrigation and Power, Government of India, for financing this study.

REFERENCES

KHADE V.N., PATIL, B.P., KHANVILKAN, S.A., DONGALE, J.H. and THORAT, S.T. (1989). Evaluation of sprinkler method of irrigation for green gram and groundnut. **J. Maharashtra Agric Univ., 14**: 117-118.

MICHAEL, A.M. (1989). **Irrigation: Theory and Practice.** Vikas publishing Company, New Delhi, pp. 624-625.

Madras Agric. J., 82(2): 85-87 February, 1995

INFLUENCE OF BIO-REGULATORS ON BIOMASS PRODUCTION IN MULBERRY *(Morus alba)*

K. MANIAN, M. NAGARAJAN, G.PADMANABHAN, and K. ANNAMALAINATHAN.

Department of Crop Physiology, Agricultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore. 641 003

ABSTRACT

Foliar application of bioregulators. *viz* 2-3-4- dichlorophenoxy triethylamine, (DCPTA) (Photosynthogen), mixtalol (Paras) and triacontanol (Vipul) on the fresh leaf biomass production in mulbery (Var.Kanva -2) was assessed. The study revealed that photosynthogen at 25 g.ai./ha. significantly increased the leaf number, leaf area and fresh leaf biomass than paras or vipul. The increased leaf biomass in mulberry due to photosynthogen spray was by high source activity as evidenced by high chlorophyll and high soluble protein content.

KEY WORDS : Mulberry, Photosynthogen, leaf biomass

Bioregulators have been shown to increase the growth and biomass in a wide variety of crop plants. Increased plant height and internodal length by triacontanol were reported in tomato and pea (Henry and Kelm, 1980 Gunasekaran and Shanmugavelu, 1983). Tertiary amine bio regulator DCPTA has been shown to promote growth and biomass through regulations of chloroplast development and chlorophyll compartment (Keithly and Yokoyama 1987, 1988). Increased leaf and root meristem activities of DCPTA could potentially increases photosynthate production and