



EFFECT OF NITROGEN LEVELS AND APPROPRIATE WEED CONTROL PRACTICES IN WHEAT (*TRITICUM AESTIVUM* L.)

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ABSTRACT

Keywords:

Growth,
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2, 4-D (Na-salt)

A field experiment was conducted during *rabi* season of 2004 to evaluate the optimum dose of nitrogen and appropriate weed control practices in wheat. The experiment comprising 15 treatment combinations with three replications were laid out in factorial randomized block design results showed that significantly higher yield attributes *viz.* total number of tillers, effective tillers, straw and grain yield but at par with 150kg N/ha. Among others the best treatment was metsulfuron methyl 6g a.i./ ha at 30 DAS followed by pendimethalin@10kg a.i./ha as PE and 2,4-D Na-Salt (30 DAS). Significantly higher number of tillers, effective tillers, straw and grain yield were recorded in two hand weeding + Interculturing at 30 and 45 DAS treatment over weedy check but these were statistically at par with metsulfuron methyl@6g a.i./ha. 30 DAS.

INTRODUCTION

Wheat (*Triticum aestivum* L.) is one of the important food crop cultivated in almost all countries of the world. In India, Wheat is next to paddy both in terms of area and production but stand first in productivity amongst the cereals. Nitrogen is one of the most important nutrient as well as expensive input in agricultural production. An adequate supply of nitrogen is closely associated with growth and development of crop plants. Its, play an important role in plant metabolism by virtue of being an essential constituent of structural cell and many divers type of metabolic active compounds. It is also a constituent of chlorophyll, which is important for harvest of solar energy (Bray, 1983). Nitrogen is costly input and lost in many ways including weeds also. Weeds is one of the major constraint for the poor yield of wheat crop as they compete with the crop plant for moisture, minerals nutrients, light & space. Weeds causes more damage in crop production compared to insects and diseases, but due to hidden loss caused by weeds, It has not been drawn much attention by agriculturist. The severe crop weed competition results in reduction of yield to the extent of 73 pre cent in wheat (Naik *et al.*, 1997). Wide range of herbicides has been tested in india for wheat crop, among which few herbicides like Pendimethalin, 2,4 D Na-Salt, fluchloraline, *etc.*, found effective in controlling weeds but a few specific weed species *e.g.*, *Asphodelus tenuifolius* L. were not controlled with these herbicides wither applied as pre or post emergence application. Romal of such weeds through hand weeding at its flowering stage is also very difficult herbicides.

MATERIALS AND METHODS

A field experiment was conducted at Agronomy Farm, chiman Bhai Patel college of Agriculture, Sardar krushinagar Dantiwada Agricultural university, Sardar krushinagar. Distt. Banaskantha, Gujarat during *rabi* season of 2004-2005. The soil was loamy sand in texture, organic matter (0.15%) and available Nitrogen (149 kg/ha), phosphorus (45kg/ha) and potassium 287 kg/ha contents soil depth 0-15 cm with PH of 7.5. The experiment was laid out in factorial randomized block design with three replication, fifteen treatment combinations comprising three different nitrogen levels (120,150 and 180kg/ha) and five weed management practices (pendimethalin @1.0kg/ha pre-emergence, 2-4-D,(Na-salt)@0.750 kg/ha at 30-DAS, Metsulfroun methyl@6g/ha at 30 DAS, two hand weeding + interculturing at 30 DAS and 45 DAS and weedy check, crop were sown 23 Nov. 2004 in lines spaced 22.5 cm by variety GW-322 C/S were drilled evenly in each plot manually at depth of 4-5 cm in previously fertilized furrow and covered properly with the soil.

RESULTS AND DISCUSSION

Effect of nitrogen levels

Experimental results (Table1) showed that plant stand recorded at 20 DAS, plant height, number of total and effective tillers significantly influenced by nitrogen levels at 60 DAS and at harvest. Significantly the highest plant height, number of total and effective tillers was recorded by 180kg nitrogen/ha being at par with 150kg nitrogen/ha, significantly the lowest with

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120kg nitrogen/ha. Nitrogen being constituent of various essential metabolites including protein amino acid as well as structural constituent of cell, influence in different physiological process such as cell division and delete spaceelongation when resulted in higher number of tillers. Increased invalue of number of tillers, with in nitrogen rate was report by Panday *et al.* (2003) and Chanda and Gunri (2004). Grain and straw yield of wheat was significantly increase with increase in nitrogen level upto 150kg/ha. These finding in similar as obtained by Patel *et al* (2004) and Yadav *et al.* (2005). Test weight (1000 grain weight) and harvest index of wheat was not significantly influenced due to nitrogen levels and weed management practices. However, numerically maximum value was obtained with N3 levels. These finding are also line with Chanda and gunri (2004) and Pandey *et.* (2005).

Effect of weed Control Practices

Experimental results (Table1) showed that significantly maximum values of growth, yield attributing and yields *viz.* Plant height, total number of tillers, effective tillers per meter row length were recorded under two hand weeding + Interculturing at 30 DAS and 45 DAS. Treatment Metsulfuron methyl 6g

/ha. (POE) at 30 DAS, Pendimethalin 1.0 kg/ha. (PE) and 2, 4-D (Na salt) 0.750kg/ha. (POE) at 30 DAS were found equally effective in respect of recording higher value of effective tillers per meter row length as recorded in to hand weeding and interculturing at 30 and 45 DAS. More number of effective tillers per meter row length where attributed to the elimination of majority of weeds due to knock down effect of herbicide. Shortest plant height was recorded under treatment W5 (weedy check) might be due to sever computation by weeds for recourses that made the crop plant in efficient to take up moisture and nutrients. Consequently the plant growth was affected. Similar result reported by Suresh Kumar and Singh (1994) and Pandey *et al.*, (1997). The grain yield and straw yield (q/ha) were significantly higher in all weed control methods than weedy check. Among different weed management practices, the highest mean grain and straw yield was recorded in two and weeding + interculturing at 30 and 45 DAS. But remained at par with treatment Metsulfuron methyl 6g /ha. (POE) at 30 DAS and Pendimethalin 1.0 kg/ha (PE). These finding are in conformation with those reported by Singh and Singh (1996) and Pandey *et al.*, (2005).

Table 1 Effect of nitrogen levels and appropriate weed control practices in wheat

Treatment	Plant stand/ sq. meter		Plant height(cm)		Total number of tillers meter row length		Effective tillers /meter	Test weight (g)	Grain yield (q/ha)	Straw yield (q/ha)	Harvest index (%)
	20 DAS	At harvest	60 DAS	At harvest	60DAS	At harvest					
<i>Nitrogen Level (N)</i>											
N1: 120kg/ha.	29.26	18.90	45.2	83.7	98.28	88.42	81.80	37.48	35.69	52.09	40.47
N2: 150kg/ha.	30.14	21.50	49.1	92.7	102.95	97.83	93.26	37.73	40.04	57.94	40.75
N3: 180kg/ha.	29.74	20.15	51.1	97.2	107.36	102.24	94.60	38.50	42.26	59.76	41.51
CD ($P=0.05$)	NS	NS	2.63	4.93	5.06	5.03	5.60	NS	4.64	7.51	NS
<i>Weed Control Practices (W)</i>											
W1: Pendimethalin 1.0 kg/ha. (PE)	29.72	19.26	47.4	88.4	98.46	93.45	87.50	37.75	41.51	58.31	40.01
W2: 2, 4-D (Na salt) 0.750 kg/ha. (POE) at 30 DAS	29.63	20.05	46.5	87.7	97.11	92.22	87.20	37.68	37.24	55.04	40.31
W3: Metsulfuron methyl 6 g /ha. (POE) at 30 DAS	30.18	20.46	51.2	95.4	105.42	100.25	92.45	38.82	42.23	60.03	41.31
W4: Two hand weeding + Interculturing at 30 & 45 DAS	30.11	19.40	55.1	103.5	113.95	108.84	92.90	37.67	46.50	64.30	42.06
W5: Weedy check	28.92	20.50	41.9	81.5	91.06	86.06	81.40	37.60	30.16	45.30	39.86
CD ($P=0.05$)	NS	NS	3.39	6.37	6.53	6.49	6.26	NS	6.00	9.70	NS

PE= Pre-emergence, POE = Post-emergence, NS= Non-Significant

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