

Effect of thiourea on wheat yield attributes under frontline demonstrations

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ABSTRACT

Field trails were conducted in farmers fields of Kheda district of Gujarat state under frontline demonstration to study the effect of thiourea on wheat crop during Rabi 2011-12 and 2012-13. Twenty eight farmers were selected from two adopted villages of Matar Taluka of Kheda district for laying out the trials. The results revealed that application of thiourea (500 ppm) at vegetative and ear emergence stage gave higher seed yield, net return and B:C ratio as compared to farmers practices. On an average there was increase of 7.42 and 7.16 per cent during 2011-12 and 2012-13 respectively over farmers practices in grain yield in wheat crop under demonstration plots.

Keywords: Thiourea; wheat; frontline demonstration

INTRODUCTION

At global level India ranks as second largest wheat producing nation contributing approximately 11.9 per cent to the world wheat production from about 12 per cent of global area (Anon 2010). The area under wheat throughout the world as well as in India has become nearly constant around 217.9 million ha and 26.9 million ha respectively. Kheda district has rice-wheat cropping sequence hence farmers have been sowing the wheat crop late. Mostly farmers depend on canal water for irrigation which is not available throughout the season and crop suffers from soil moisture stress. Use

of thiourea has been reported to improve wheat productivity and its role as a drought ameliorant is well established under water stress condition (Sahu and Singh 1995). It has also been reported by in pulses by Anitha et al (2004). KVK, Kheda conducted the field trails at farmers fields under frontline demonstration on use of thiourea to improve the grain yield and quality of wheat crop.

MATERIAL and METHODS

Total 28 frontline demonstrations under real farming situations were conducted during Kharif 2011-12 and

2012-13 at two different villages namely Dethali and Maliyataj of Matar Taulka of Kheda district under Krishi Vigyan Kendra operational area. The area under each demonstration was 0.4 ha. In all two treatments viz T₁ (farmers practices) and T₂ (two foliar applications of thiourea 500 ppm at tillering and ear emergence stage) replicated at 16 farmers' fields during 2011-12 and 12 farmers fields during year 2012-13 were applied. The economics of treatments was calculated on the basis of prevailing market rates of the produce.

RESULTS and DISCUSSION

The weather data during the crop season are given in Table 1. There was no rain experienced during both the years of demonstration. The minimum and maximum temperature ranged from 16.60 to 31.80°C respectively in 2011-12 and from 13.40 to 29.36 in 2012-13 respectively. The relative humidity during 2011-12 and 2012-13 was 31.50 and 23.74 respectively.

The farmers applied three irrigations in demonstration plots as well as in local checks. However with application of same number of irrigations in local check and demonstration plots the effect of water stress was observed more in control plots as compared to demonstration plots. This could be due to foliar spray of thiourea in demonstration plots which was responsible for decreasing water stress which ultimately resulted in significantly higher growth, spikelet length, spikelets per plant, seeds

per spike, test weight and colour of grains as shown in Table 2.

There were considerable differences in demonstration and local check plots during both the years. In 2011-12 the plant height, effective spikelets per plant, seeds per spike, test weight and grain yield in demonstration plots were 94.2 cm, 3.52, 61.5, 40.1 g and 30.17 q/ha as against 90.4 cm, 2.84, 50.6 38.2 g and 27.93 q/ha respectively in local check whereas the corresponding figures for 2012-13 were 92.8 cm, 3.46, 62.4, 39.3 g and 34.80 q/ha in demonstration plots against 88.1 cm, 3.02, 52.8, 37.8 g and 31.60 q/ha in check plots respectively.

Sahu and Singh (1995) reported that foliar spray of thiourea significantly increased growth and yield of wheat crop due to improvement of photosynthetic efficiency. Similar findings were also reported Balai and Keshwa (2011) in coriander crop.

The input costs and output prices prevailing during both the years of experimentation were taken for calculating cost of cultivation, net returns and benefit/cost ratio (Table 2). In the year 2011-12 gross and net returns were Rs 36210 and 17056 respectively in demonstration plots as against Rs 33527 and 14687 in farmers practices. In 2012-13 the corresponding figures were Rs 51125 and 29753 in demonstration and Rs 47700 and 26595 in check plots. The BCR was 1:1.89 in

Thiourea effect on wheat yield

Table 1. Mean weather data during the crop season

Year	Meteorological month	Rainfall (mm)	# rainy days*	Temperature (°C)		Humidity (%)
				Min	Max	
2011-12	October to March	Nil	Nil	16.60	31.80	31.50
2012-13	October to March	Nil	Nil	13.40	29.36	23.74

Table 2. Effect of thiourea on growth, yield attributes and yield of wheat in demonstration and farmers practices (check) plots

Parameter	Check plot		Demonstration plot	
	2011-12	2012-13	2011-12	2012-13
# demonstrations	16	12	16	12
# irrigations	3	3	3	3
Plant height (cm)	90.40	88.10	94.20	92.80
Effective spikelets/plant (#)	2.84	3.02	3.52	3.46
Seeds/spike (#)	50.60	52.80	61.50	62.40
Test weight (g)	38.20	37.80	40.10	39.30
Grain yield (q/ha)	27.93	31.60	30.17	34.80
Increase in yield over farmers practices (%)	7.42		7.16	
Gross return (Rs/ha)	33527	47700	36210	51125
Net return (Rs/ha)	14687	26595	17056	29753
BCR	1:1.78	1:2.26	1:1.89	1:2.39

demonstration plots compared to 1:1.78 in check plots during 2011-12 and 1:2.39 in demonstration plots compared to 1:2.26 in check plots during 2012-13.

condition. High benefit/cost ratio also advocated the economic viability of the frontline demonstrations that advocated the farmers to adopt new technologies.

CONCLUSION

The results of frontline demonstrations showed that the yield of wheat could be increased by 7.42 and 7.16 per cent with the help of using innovative technological interventions in water stress

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