

VEGETATIVE AND REPRODUCTIVE RESPONSES OF STABILAN TO *TRITICUM AESTIVUM* L.

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Seeds of wheat were soaked in 0, 1000, 1100, 1200 and 1300 ppm solutions of stabilan for 24 hours. Stabilan (2-chloroethyl) trimethyl ammonium chloride treatment decreased the plant height significantly while it increased significantly the dry weight of shoot and root, number of tillers, ears, grains per plant and grain yield.

INTRODUCTION

Chemical growth regulators are known to affect the morphological and physiological changes in plants. Yield is an interplay of various genetic, physiological and environmental factors and one of the possible reasons for low yield of wheat may be excessive vegetative growth. It is possible to reduce the plant height by chemicals. Stabilan (2-chloroethyl) trimethyl ammonium chloride is known to depress the plant growth in wheat (Smith et al., 1981). Stabilan has been used as seed dressing (Khan and Wasti, 1982). It increases the grain yield (Reicosky and Branham, 1986). The present paper reports the effect of stabilan on the vegetative and reproductive characters of wheat.

MATERIALS AND METHODS

The experiment was laid out using wheat variety LU 26S in a completely randomized block design with four replications. Seeds were soaked in distilled water and 1000, 1100, 1200 and 1300 ppm of stabilan for 24 hours. Six harvests were carried out at fortnightly intervals. At each harvest, three plants were harvested at random from each

treatment and data on vegetative characters were recorded. Two plants per treatment were earmarked to record the data on yield components of wheat. Data on different characters were analyzed statistically using analysis of variance and the effect of treatments and harvests were compared by Duncan's New Multiple Range test.

RESULTS AND DISCUSSION

The results pertaining to the effect of stabilan on the vegetative and reproductive characters of wheat are presented in Tables 1 and 2. Stabilan treated plants were found to decrease in height significantly. Stabilan used at levels of 1000 and 1100 ppm reduced the height of plants significantly at fourth, fifth and sixth harvests. However, the plant height was not influenced by the treatment till the third harvest with the exception of 1000 ppm levels which reduced the plant height significantly at third harvest. The maximum decrease was observed in 1000 ppm treated plants. However, the difference between 1000 and 1100 ppm and among 1100, 1200 and 1300 ppm treatments was non-significant. Decrease in plant height was also reported by Khan and Wasti (1982) and Reicosky and Branham (1986).

Table 1 a. Influence of stabilan on vegetative characteristics of *Triticum aestivum* L.

Characters	Treatment (ppm)	Harvests					
		H ₁	H ₂	H ₃	H ₄	H ₅	H ₆
Height of plant (cm)	0	13.83 a	24.21 a	46.91 a	66.59 a	99.28 a	99.80 a
	1000	13.00 a	23.56 a	40.22 b	54.65 c	89.70 b	90.92 b
	1100	13.70 a	23.82 a	41.43 ab	58.47 bc	92.51 b	92.90 b
	1200	13.66 a	24.05 a	44.42 ab	59.93 bc	93.31 b	94.70 ab
	1300	13.83 a	24.09 a	44.87 ab	62.21 ab	94.08 b	95.06 ab
Dry weight of shoot/plant	0	0.04 a	0.25 a	1.29 b	3.53 b	4.58 d	6.17 d
	1000	0.04 a	0.25 a	1.86 a	4.62 a	6.99 a	8.67 a
	1100	0.05 a	0.25 a	1.64 ab	4.45 a	6.28 b	7.96 b
	1200	0.04 a	0.25 a	1.38 ab	4.21 a	5.98 bc	7.42 c
	1300	0.04 a	0.25 a	1.36 b	3.62 b	5.69 c	6.98 c
Dry weight of root/plant	0	0.010 a	0.058 a	0.326 a	0.613 c	0.840 b	1.035 c
	1000	0.011 a	0.060 a	0.367 a	0.785 a	0.975 a	1.241 a
	1100	0.011 a	0.059 a	0.358 a	0.729 ab	0.956 a	1.189 ab
	1200	0.010 a	0.058 a	0.334 a	0.675 bc	0.906 ab	1.164 ab
	1300	0.009 a	0.058 a	0.271 a	0.628 c	0.551 b	1.133 b

Means given in a column having the same letters are not significantly different at $P < 0.05$.

Table 1 b. Treatment means

Stabilan concentration (ppm)	Plant height (cm)	Dry weight of shoot (g)	Dry weight of root (g)
0	58.44 a	2.66 c	0.48 d
1000	52.02 c	3.74 a	0.57 a
1100	53.81 bc	3.44 b	0.55 ab
1200	55.01 b	3.21 c	0.52 bc
1300	55.69 b	2.98 d	0.49 cd

Means with the same letters are not significantly different at $P < 0.05$.

The root dry weight was significantly increased by the application of stabilan. The dry weight of root increased significantly by various concentrations of stabilan used at sixth harvest and in plants treated with 1000 and 1100 ppm at fourth and fifth harvests. These results are in agreement with the findings of Khan and Wasti (1982) who reported increase in root dry weight due to seed treatment.

bilan. One thousand, 1100 and 1200 ppm stabilan treated plants showed significant increase in the number of tillers and ears per plant, whereas the number of grains per plant was significantly increased in plants treated with 1000 and 1100 ppm. Seed treatment with stabilan significantly increased the grain yield of ten plants plot. The results of the investigation indicate that the grain yield decreased with the increasing

Table 2. Influence of stabilan on yield components of *Triticum aestivum* L.

Stabilan concentration (ppm)	No. of tillers/plant	No. of ears/plant	No. of spikelets/plant	No. of grains/ear	No. of grains/plant weight	1000-grain weight (g)	Total grain yield/plant (g)
0	6.38 c	6.08 c	16.33 a	39.12 a	237.63 b	46.63 c	1765.90 d
1000	7.70 a	7.40 a	15.66 a	38.10 a	281.48 a	50.91 a	2299.88 a
1100	7.38 a	7.33 a	16.42 a	37.88 a	277.08 a	49.76 ab	2178.30 ab
1200	6.90 b	6.83 b	15.93 a	37.30 a	254.08 b	49.04 b	2050.13 bc
1300	6.63 bc	6.43 bc	16.48 a	39.06 a	250.88 b	48.50 b	1936.00 c

Means given in a column having the same letters are not significantly different at $P < 0.05$.

Shoot dry weight was increased significantly by stabilan used at various levels. The dry weight of shoot increased significantly by four concentrations used during this investigation at fifth and sixth harvests and in plants treated with 1000, 1100 and 1200 ppm at fourth harvest. Increase in shoot dry weight was also reported by Khan and Anjum (1989) by the application of stabilan as seed dressing. Wang *et al.* (1980), however, observed decrease in shoot dry weight due to seed treatment of wheat. This variation might be due to difference in dosage, time and method of application of stabilan.

The data presented in Table 2 indicate that the yield components of wheat decreased with the increasing levels of sta-

bilan. The results agree with the findings of Reincosky and Branham (1986) who reported an increase in grain yield. Some workers observed that grain yield was not affected by the application of chlormequat.

Stabilan application increased the grain yield and prevented lodging. These results are in conformity with the findings of Reincosky and Branham (1985) who recorded increased grain yield and also resistance towards lodging. Stabilan seed dressing did not significantly influence the ear length, number of spikelets per ear, number of grains per spikelet, and number of grains per ear. Eichenauer *et al.* (1986) reported that CCC treatment of wheat plants reduced the num-

ber of spikelets per ear but did not necessarily reduce the fertility of whole ear. These differences may be due to variation in dosage, method of application and sensitivity of the experimental material to stabilan.

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