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Evaluation of Bread Wheat on Different Fertilizer Levels

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Abstract: An experiment was conducted at Student's Experimental Farm, Department of Agronomy, Sindh Agriculture University Tandojam during Rabi 2000-2001. Seven treatments viz. T₁(00-00-00) control, T₂(100-50-50 NPK), T₃(120-60-50 NPK), T₄(140-70-50 NPK), T₅(160-80-50 NPK), T₆(180-90-50 NPK) and T₇(200-100-50 NPK) were tested to assess the effect of fertilizer levels on the yield and yield contributing characters of wheat variety T.J.-83. The fertilizer levels of NPK (T₆) recorded significantly maximum weight of 1000 grains (43.19 g), biological yield (10833.3 Kg ha⁻¹) and grain yield (3930 Kg ha⁻¹). Results suggested that the combinations of 160-80-50 and 180-90-50 NPK Kg ha⁻¹ produced satisfactory grain yield of wheat and could be recommended as farmers guideline.

Key words: Wheat, NPK fertilizer, grain yield

INTRODUCTION

High yielding varieties and balanced fertilizer plays a vital role in increasing yield of wheat. This signifies that an optimum rate of fertilizer is an important agronomic factor. However, its application at proper stages should be maintained. Bekele *et al.*^[1] reported the significant cultivars and environment differences for grain yield, biological yield and harvest index of wheat. Due to importance of cereals in the agrarian economy of Pakistan, the present research was initiated for evaluation of bread wheat under different NPK levels.

MATERIALS AND METHODS

An experiment was conducted at Student's Experimental Farm, Sindh Agriculture University Tandojam, Pakistan during Rabi, 2000-2001 to determine the effect of inorganic fertilizer (NPK) for yield and yield contributing characters of wheat variety T.J.-83.

The control and six fertilizer levels applied were viz. T₁=00-00-00 (Control), T₂=100-50-50, T₃=120-60-50, T₄=140-70-50, T₅=160-80-50, T₆=180-90-50 and T₇=200-100-50 for assessing the number of grains per ear head, weight of grains per ear head, weight of 1000 grains, biological yield Kg ha⁻¹ and grain yield Kg ha⁻¹. The cultural practices were adopted uniformly to maintain the experimental area.

RESULTS AND DISCUSSION

The mean performance and mean square for number of grains/ear head, weight of grains/ear head, weight of 1000 grains, biological yield and grain yield are present in Table 1. The statistical analysis for weight of 1000 grains, biological and grain yield were highly significant in all the treatment under different fertilizer levels.

The number of grains per ear head showed that fertilizer treatment T₅ produced the highest number of grains per ear head (45.86) followed by T₇ (45.45), the highest weight of grains per ear head were under T₄ (1.55 g), the highest weight of 1000 grains were recorded in T₆ (43.15 g), the highest biological yield was exhibited in T₆ (10833.3 g) and the maximum grain yield was demonstrated in T₆ (4075.00 Kg ha⁻¹).

It showed that the wheat variety T.J.-83 was highly responsive to different levels of fertilizers and the magnitude of characters were increased by the increasing the fertilizer rate upto T₆ (180-90-50). However, beyond 180-90-50 fertilizer level, the magnitude of characters were declining.

It was concluded from this research that NPK fertilizer dose of 160-80-50 and 180-90-50 Kg ha⁻¹ gave the maximum grain yield, but increasing/decreasing fertilizer from this level decreased the grain yield as well as its contributing characters. Our results also confirms the findings of Anderson and Olsen^[2], Tanaces *et al.*^[3]

Table 1: Mean performance and mean squares for yield and yield contributing characters at different fertilizer levels

Treatment/Fertilizer NPK Kg ha ⁻¹	Number of grains ear head ⁻¹	Weight of grains ear head ⁻¹ (gm)	Weight of 1000 grains (gm)	Biological yield Kg ha ⁻¹	Grain yield (Kg ha ⁻¹)	
T ₁ =00-00-00	37.90	1.35	28.14c	4500.00c	1291.78f	
T ₂ =100-50-50	46.00	1.48	32.31b	8583.35b	3067.0e	
T ₃ =120-60-50	43.84	1.43	32.77b	8500.00b	3255.25d	
T ₄ =140-70-50	44.89	1.55	32.83b	8666.65b	3634.0c	
T ₅ =160-80-50	45.86	1.45	33.23b	9250.00b	3930.0ab	
T ₆ =180-90-50	45.29	1.52	43.19a	10833.30a	4075.0a	
T ₇ =200-100-50	45.45	1.49	34.37b	8333.35b	3888.0b	
Mean squares	d.f					
Replication	3	85.80	0.03	80.32	850192.67	31638.71
Treatment	6	34.05 n.s	0.02n.s	83.37**	14646713.5**	3696545.6**
Error	18	41.42	0.05	19.06	1639762.33	27201.45
LSD 5%				5.90	1733.34	223.24
LSD 1%				7.89	2320.15	298.81

Giorgio *et al.*^[4], Grignani^[5], Vieira *et al.*^[6], Wojcikiewicz *et al.*^[7], Pal *et al.*^[8] and Dinesh *et al.*^[9].

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