

Effect of different levels of a compound fertilizer on wheat

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Introduction

Obtaining high yield of wheat on calcareous soils of Saudi Arabia requires high input of nutrients to maintain adequate soil fertility levels.

Objectives

1. Replace farmer's use of straight fertilizers with a complete 14-38-10 fertilizer for wheat.
2. Determine the rate of 14-38-10 that will give farmers a profitable yield.

Experimental Design

Field experiments were conducted in 2004 through 2006 in Al-Jouf region of Saudi Arabia using a randomized complete block design with 6 fertilizer levels (0-700 kg of 14-38-10/ha) and 4 replications.

Conclusion

For soils having low to medium P content, to maintain good soil K fertility, and to obtain optimum wheat yield, 300-500 kg/ha of 14-38-10 should be applied during the growing season without the need to inject any P or K fertilizers through the irrigation system.

Observations

The conventional wheat variety 'Yecoro Rojo' was used. The field was irrigated with a center pivot system. Urea was applied with irrigation water for all treatments in split doses according to the farmer fertilizer practice. Vigorous plant growth in plots treated with 14-38-10 has attracted many farmers in the region to visit the farm. However, during the first season at the critical grain filling stage, the field was damaged by hot wind resulting in severe yield loss. During the second season, blowing wind was not as severe, but caused some wheat lodging resulting in some yield loss and significant variability in the data. Nitrogen, P and K concentrations in above-ground plant parts were increased over time with increasing levels of 14-38-10 then declined thereafter as plant reached maturity.

Results

Application of 14-38-10 increased N, P and K concentrations in plants to optimum levels, particularly P. In the first season, application of 400 kg/ha or more increased significantly the number of tillers per plant, the number of plants per unit area, and grain yield while the application of 300 kg/ha or more during the second season increased significantly all those variables. The best grain yield in both seasons was obtained at the rate of 500 kg/ha.



Experimental treatments



Wheat growth, tiller density, and grain production



Wheat crop just before harvest

