

## Effect of Plant Growth Regulator on Vegetative Growth and Yield Components of Winter Wheat under Different Levels of Irrigation

**Authors :** Mohammed Ahmed Alghamdi

**Abstract :** Field experiment were carried out to investigate the effect of the plant growth regulator on vegetative growth and yield components of reduced height isogenic lines of the wheat (*Triticum aestivum* L.) cultivar Mercia. The Field experiment compared the growth regulator response of seven isogenic lines of Mercia. Growth regulators reduced plant height significantly in all lines. Growth regulator decreased total dry matter and grain yield with greatest reduction generally for the control and Rht8 lines. Rht1 was the least affected. There were few significant effects of growth regulator on gas exchange and chlorophyll fluorescence but the trend was for greater values with growth regulator. In this field experiment, a rate of 2.0 l ha<sup>-1</sup> applied just before the third node detectable stage under non water stressed and water stressed conditions gave slight increases in yield of up to 14% except for line Rht10 which increased significantly in non-stressed conditions. In the second glasshouse experiment, a rate of 2.5 l ha<sup>-1</sup> applied at the start of stem elongation under 30% FC and 100% FC gave reductions in yield up to 16% for the growth regulator and 55% under water stress. In the field experiment, rates of 2.5 and 3.0 l ha<sup>-1</sup> applied at the start of stem elongation gave reductions in yield up to 20% mainly through individual seed weight. In the final glasshouse experiment, rates of 2.5 and 3.0 l ha<sup>-1</sup> applied at 6 leaves unfolded and 1st node detectable both reduced grain yield.

**Keywords :** growth regulator, irrigation, isogenic lines, yield, winter wheat

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