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MODELING OF IN-SEASON WINTER WHEAT NITROGEN REQUIREMENTS USING PLANT REFLECTION INDICES

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Abstract

A significant reduction in nitrogen (N) losses from agricultural fields will make a positive impact on the environment. Managing nitrogen for the optimum application provides economic benefits as well as environmental protection. This study presents a model that was developed to determine the optimum ratio of N to yield based on N sensor indices in winter wheat. A quadratic polynomial model was used to characterize the relationship between N and yield for the optimum N rate. The N was applied to the Bezostaja and Ahmetaga wheat varieties at 0 kg N ha^{-1}, 80 kg N ha^{-1}, 120 kg N ha^{-1}, 160 kg N ha^{-1} and 200 kg N ha^{-1} ratios. The results showed that the most economical mean estimated N rate was 167.6 kg N ha^{-1} for Bezostaja and 206 kg N ha^{-1} for Ahmetaga.

Keywords: fertilizing, precision agriculture, vegetation index, wheat, yield

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