DEVELOPMENT OF A SOIL N TEST FOR FERTILIZER REQUIREMENTS FOR WHEAT

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Abstract

Optimal fertilizer nitrogen (N) rates result in economic yield levels and reduced pollution. A soil test for determining optimal fertilizer N rates for wheat has not been developed for Quebec, Canada, or many other parts of the world. Therefore, the objectives were to determine: 1) the relationship among soil nitrate (NO^-_3)- N, soil ammonium (NH^+_4)- N and N fertilizer on wheat yields; and 2) the soil sampling times and depths most highly correlated with yield response to soil NO^-_3-N and NH^+_4-N. In a three year research work, wet and dried soil samples of 0- to 30- and 30- to 60-cm depths from 20 wheat fields that received four rates of N fertilizer at seeding and postseeding (plants 15 cm tall) were analyzed for NH^+_4-N and NO^-_3 -N using a quick-test (N-Trak) and a standard laboratory method. Wheat yield response to N fertilizer was limited, but strong to soil NO^-_3-N.

Keywords: fertilizer requirements; N test; organic matter; soil N mineralization; soil NO-3 and NH+4; wheat (Triticum aestivum L.) production

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