Topic:

Effects of Nitrogen fertilizer stabilizer on the Growth and Yield of Silage corn

Abstract

The provincial government of Newfoundland (NL) is devoted to expanding the land base for agricultural production from the current ~8.4%, while implementing agricultural practices that reduces environmental risks. Practices such as monocropping and high nitrogen (N) fertilizer applications can increase N content which can be loss through leaching, denitrification, runoff, and volatilization. Formulations of nitrogen fertilizer with urase inhibitors (UIs) or nitrification inhibitors (NIs) can minimize nitrogen loss thereby improving N use efficiency. Stabilizers such as nitrapyrin, N-(n-butyl) thiophosphoric triamide (NBPT), and dicyandiamide (DCD) are of interest here. The objective of this research is to evaluate the effect of nitrogen fertiliser stabilizer on the growth and yield of silage corn. A field experiment was conducted at the Western Agriculture Research Station, Pynn's Brook, NL. Experimental treatments included five corn-based crop rotation sequences and six N fertilizer treatments, all replicated four times for a total of 120 3 x 4 m^2 plots in a randomized complete block design. Corn was planted (90,900 seeds/ha) in all plots and fertilized at a rate of N = 115 kg ha^{-1} using six fertilizer treatments ((1. urea (UR, no stabilizer); 2. SuperU™ (SU, urea with DCD and NBPT); 3. Agrotain™ (AG, urea with NBPT); 4. eNtrench™ (EN, urea with nitrapyrin); 5. Ammonium nitrate (AN, 30% starter + 70% top dressed)) randomly assigned to plots in each block; and 6. no N fertilizer control (CTRL). The results showed that only SU produced significant corn yield responses to N fertilization.

Key words

Nitrogen, Inhibitors, Stabilizers, Fertilisers, Silage Corn