

**Title:**

**“Effects of Nitrogen Fertilizer Stabilizers on Soil Microbial Gene Expression Under Different Feed Crops in a Boreal Climate”.**

Irfan Mushtaq

Boreal Ecosystem and Agricultural Sciences, Grenfell campus, Memorial University of Newfoundland, 20 University Dr, Corner Brook, NL A2H 5G5, Canada.

Email: [imushtaq@grenfell.mun.ca](mailto:imushtaq@grenfell.mun.ca)

**Descriptive abstract**

---

Nitrogen (N) is an essential macronutrient and plays an important role in enhancing the growth, development, and yield of crops. Farmers are using more nitrogenous fertilizers to increase their crop yield. However, more than 70% N fertilizer application is lost either through leaching, volatilization or greenhouse gas emission, (GHGE). To overcome these losses we are using nitrification and urease inhibitors to check the effect on soil microbial diversity and structure and the abundance of genes involved in nitrification and denitrification processes in podzolic soils. A field research experiment with factorial RCBD including 18 treatments, 4 blocks with (3 x 4) m<sup>2</sup> area of the plot. Crops were Corn, wheat and Faba Bean & N sources were No N fertilizer (CT), Urea, split urea (30% & 70%) application), Agrotain, Super U and EnTrench. Three 300-g soil samples were collected and processed. RNA from 2 g samples will be extracted with RNA PowerSoil<sup>®</sup> Total RNA Isolation Kit (MoBio). Complementary DNA (cDNA) will be synthesized with a high sensitivity kit and stored at -20 °C until quantification via qPCR. This novel study has not been studied in NL and will focus on the clear mechanism that how inhibitors affect the microbial communities.