

# **“Cover Crop Mixture: Harnessing Diversity to Enhance Nitrogen Retention in Agroecosystems”**

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## **II. Abstract**

Nitrogen loss from agroecosystems is a leading contributor to non-point source pollution in the northeastern US and an inefficiency that increases agricultural production costs. Cover cropping is an effective and widely promoted strategy that increases N retention to counter these negative impacts of production. In recent years, a growing number of farmers have expressed interest in the use of cover crop “cocktails” (species mixtures) to provide multiple ecosystem services, though little research-based information is available on the management or ecosystem functions of mixtures. Mixtures are a promising strategy to augment N retention provided by cover crops, as plant diversity typically leads to increased productivity, and, consequently, increased N uptake. Further, a nascent understanding of linkages between aboveground diversity and belowground processes indicates that mixtures may also promote increased N retention in soil microbial biomass by boosting microbial activity and enhancing belowground diversity. We will conduct a field experiment to assess the impact of cover crop mixtures on N retention in both above- and below-ground biomass and the effects of aboveground diversity on functional and compositional diversity below ground. Mixtures are an innovative strategy to boost cover crop ecosystem services and advance agricultural sustainability.