

Nitrogen Contribution of Grass-Legume Mix Cover Crops in Sustainable Sweet Corn Production

Parisa Akbari, Stephen J. Herbert



It is well documented that cover crops enhance soil health, natural soil fertility, and reduce off-farm fertilizer purchases. There is an increased interest in integrating cover crop systems into sweet corn production. Sweet corn has an important economic and ecological relevance in the Northeast region, where tillage and herbicide application are still common practices. In New England where considerable rainfall occurs in the period between soil preparation/planting and rapid phase of plant growth, a large portion of nitrogen will be lost by leaching to the soil below the root zone. Many farmers traditionally over-fertilize corn fields to compensate for such nitrogen losses. This approach affects farm profitability and increases the risk of environmental nonpoint source pollution. Therefore, cover crop planting is necessary for conserving nitrogen over the winter and early spring while assuring an adequate crop yield. In cropping systems, cover crop nutrient availability depends on a more or less rapid mineralization of the cover crop residues, which makes nutrients progressively available to the following crop.

In a two-year experiment, we are studying an overwintered grass (rye), legume (hairy vetch) and winter kill grass (oat) cover crops in pure stands and grass-legume mixtures to quantify nutrients contribution of cover crops to the successor crop (sweet corn). The mixtures have two different hairy vetch seed rates to explore the possibility of reducing the seed cost when using legume cover crops in the Northeast region. The nutrient accumulation in cover crops in early spring and the decomposition and nutrient release patterns of cover crop residues will be determined when planted with sweet corn. Data from this research will enable the development of an innovative production system for early sweet corn taking full advantage of the benefits of cover crops.