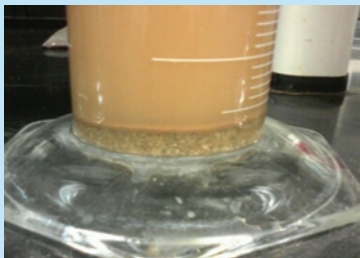


Landscape Scale Variability in Plant Performance: Preliminary Findings from Two New Michigan CAP Sites

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Agricultural fields and farms are naturally topographically diverse, ranging from hilly to flat. One element of the project conducted by the Michigan State University team, led by Dr. Sasha Kravchenko, is quantifying the impact of such topographical variations on cover crop performance and on cover crop contribution to corn growth and yield. Previous work of our team demonstrates that relationships between red clover cover crop and yield of following corn crop differ substantially in different topographical positions. Two experiments initiated in southwest and central Michigan will allow testing the hypothesis that the effect of rye cover crop presence in the rotation also varies depending on topography. Each site is comprised of two replicated blocks, each containing three contrasting topographical positions: summit, slope, and depression. Analysis of baseline soil data showed topography driven variations in soil bulk density, texture and organic matter. Along with variations in soil moisture and temperature they contributed to spatial trends of increased corn biomass and yield in depressions followed by summits and slopes. Interestingly, an opposite trend with increased rye biomass in summits was observed in the first year of data collection (May 2012). Data collected by our team in previous experiments indicated that 3-4 fold topography driven differences in rye biomass can occur within a single year, while 2-3 fold variations have occurred among different years. After five years, these experiments will allow us to quantify the effects of year-to-year weather variation, topography and soil properties on rye cover crop performance.



Pictures shown, from top to bottom, are: Project intern Joe Devota planting at the KBS field, Joe Devota fertilizing at the KBS field, texture analysis showing a sand fraction, and Joe Devota and project intern Vance Gawel doing greenhouse gas analysis at the Mason field.



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