# Relationship between Spatial Variability of Soil Compaction and Corn Yield. (A08-miao174231-Poster)

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## Abstract:

Slight and moderate soil compaction have several desirable effects on crop growth and development, but severe soil compaction can greatly restrict root growth and development, reduce water and nutrient uptake, and may cause yield reduction. In recent years, the development of digital penetrometers has provided us with the ability to measure the intensity, extent, depth and thickness of compaction layers, and their temporal variability as well. However, the relationships between the spatial and temporal variability of soil compaction and crop yield have not been fully studied. In this research, a hydraulic compaction measurement system mounted on an All Terrain Vehicle (ATV) was used to measure soil penetration resistance to a depth of 16 inches in 2 no-till and 2 conventionally tilled corn fields in eastern Illinois. Two corn varieties, Pioneer 33G26 and 33J24, were planted side-by-side in each field using the Pioneer Split-Planter Comparison Method. The soil penetration resistance was measured on a regular grid before planting, during growing season, and after harvest in year 2001 to assess both spatial and temporal variability. Corn yield maps of both varieties were compared with the spatial patterns of soil compaction on different dates to determine if soil compaction was a limiting factor in any of the four fields, and if so, at what compaction level, and how much yield was reduced. The implications for site-specific tillage will be discussed.

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