EFFECTS OF TILLAGE ON SOIL ARTHROPOD FAUNA IN CENTRAL SOUTH DAKOTA

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ABSTRACT

Tillage methods are management practices in central South Dakota field crops that directly influence soil properties and biotic components. Assessing the effect of differing tillage methods on the soil arthropod fauna is the primary objective of this project. Tillage methods were grouped into three treatments (long-term grass [control], no-till, and tilled). Nine sites of differing crops and soil types were selected for replication. At each site the soil fauna was sampled in three fields of the same soil type and which represented each management method. Four sub-samples from each field were pooled to make a field sample, each sub-sample included approximately one liter of soil from at and below the surface. Arthropods were extracted from soil samples by hand and using modified Tullgren-style funnels. Pitfall traps were used to sample surface-active arthropods. Five sampling trips 20-30 days apart were made during the season. A total of 89 specimens of Parajapyx (Parajapyx) isabellae (Grassi) (Insecta: Diplura) were collected from all sites and throughout the sampling season. When comparing treatments for this species 7 grass sites yielded 26 specimens, 8 no-till sites yielded 39 specimens, and 5 tillage sites yielded 24 specimens. Preliminary assessments suggest that increased vegetative cover (weed and crop), distance from unplowed areas, or localized field characteristics are important for maintaining dipluran presence and abundance.