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EFFECTS OF TILLAGE PRACTICES IN SUGAR BEET ON ABUNDANCE AND DIVERSITY OF PREDATORY ARTHROPODS

ABSTRACT

Strip tillage provides many potential agronomic benefits, including reduced fuel and labor costs, reduced erosion, improved soil tilth, and enhanced water retention. Reduced soil disturbance and increased water retention associated with strip tillage also may affect density and diversity of arthropods. We examined the effects of tillage as well as various irrigation regimes on predatory arthropod fauna in sugar beet. Experiments were conducted over three growing seasons at the University of Idaho Kimberly Research and Extension Center. Carabid abundance and species richness did not differ between tillage treatments during the course of the study. Staphylinidae and Opiliones were more abundant in strip-tilled plots early in the season and more abundant in conventionally tilled plots late in the season. Spiders generally were more abundant in strip-tilled plots. Enhanced ground cover, higher humidity, more moderate temperatures, and higher numbers of potential prey in strip-tilled plots may have favored predacious arthropods. Abundance of foliar-inhabiting predators and parasitoids was not affected by tillage treatment, but parasitoid numbers decreased with higher irrigation input during one year of the study. The results suggest that strip tillage favors certain soil-dwelling groups of predatory arthropods, which might contribute to pest suppression in sugar beet systems with reduced tillage. Ongoing studies are clarifying the effects of direct seed production of sugar beet on predatory arthropods.
