

Impacts of Organic Zero Tillage Systems on Crops, Weeds, and Soil Quality

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SUMMARY

Organic farming has been identified as promoting soil quality even though tillage is used for weed suppression. Adopting zero tillage and other conservation tillage practices can enhance soil quality in cropping systems where synthetic agri-chemicals are relied on for crop nutrition and weed control. Attempts have been made to eliminate tillage completely when growing several field crops organically. Vegetative mulch produced by killed cover crops in organic zero tillage systems can suppress annual weeds, but large amounts are needed for adequate early season weed control. Established perennial weeds are not controlled by cover crop mulch. Integrated weed management strategies that include other cultural as well as biological and mechanical controls have potential and need to be incorporated into organic zero tillage research efforts. Market crop performance in organic zero tillage systems has been mixed because of weed, nutrient cycling, and other problems that still must be solved. Soil quality benefits have been demonstrated in comparisons between organic conservation tillage and inversion tillage systems, but studies that include zero tillage treatments are lacking. Research is needed which identifies agronomic strategies for optimum market crop performance, acceptable levels of weed suppression, and soil quality benefits following adoption of organic zero tillage.

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