

#44: Damage and Damage-Control: Invertebrates within Sustainable Cropping Systems
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Reducing synthetic chemical inputs and tillage can have numerous benefits in agroecosystems, such as building soil health, promoting biodiversity, and reducing non-target effects of pesticides. In addition to these benefits, low-disturbance cropping systems may also enhance predator communities and biological control potential. While tillage can kill or disrupt invertebrates, planting a winter cover crop may help sustain invertebrate communities by providing habitat and nutritional resources. We investigated soil and cover crop management practices on arthropods within a reduced-tillage organic cropping systems experiment. We measured crop damage from invertebrates and predation rate of insects in maize plots undergoing four different crop management strategies. In 2015, herbivore damage did not differ among the four cropping systems. Larvae of European corn borer (*Ostrinia nubilalis*), a key pest for maize in Pennsylvania, were more prevalent in treatment plots preceded by a red clover (*Trifolium pratense*) and timothy (*Phleum pratense*) winter cover crop than by hairy vetch (*Vicia villosa*) and triticale (*Triticale hexaploide*) but there were no differences in damage from this pest. In baited predation assays, predation rates of sentinel prey were higher in treatment plots preceded by hairy vetch and triticale before the cover crop was terminated, but did not differ after maize emergence. No difference among tilled maize plots and non-tilled maize plots were measured for any of the invertebrate parameters measured. This data will continue to be collected for two more years to further understand effects of cover crop species and tillage on invertebrates within organic maize plots.