

Impact of Transitions to Organic Farming Systems on Plant-Parasitic and Free-Living Nematode Communities

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Soil samples for nematode assays were taken in April, June (and/or) July, and September. Each sample was composed of 30-40 cores, which were composited, and a 500-cm³ subsample was removed. A 250-cm³ subsample was processed by elutriation and centrifugation for enumeration of nematodes. Soil-inhabiting nematodes were classified into trophic groups (omnivores, bacterivores, fungivores, predators, and plant parasites) and plant-parasitic nematodes were identified to genus or species. Soil microbial biomass was estimated by fumigation of soil samples. Data were analyzed using the repeated measures procedure of SAS (SAS Institute, Cary, NC) using orthogonal contrasts, and correlation.

All groups of nematodes increased over the growing seasons. There was no effect of treatments evident on any group of soil-inhabiting nematodes ($P < 0.10$). Fungivorous nematodes increased in population density until July and then declined somewhat. The increase in fungivores at the July sampling resulted in a significantly lower ratio of bacterivores to fungivores (BF ratio) at this time. The BF ratio has been considered to be an important indicator of ecosystem health, but may be affected by the time of sampling.

The principle genera of plant-parasitic nematodes found at this site were *Tylenchorhynchus*, *Paratrichodorus*, *Xiphinema*, and *Pratylenchus*. All genera increased over the period of sampling. Only *Xiphinema americanum* was affected by treatments. There were lower ($P < 0.05$) numbers of *X. americanum* in plots that received additional tillage to control weeds.

Numbers of omnivores, *Paratrichodruss minor*, and *Tylenchorhynchus claytoni* tended to be negatively correlated with microbial biomass, whereas *Pratylenchus* spp. tended to be positively correlated with microbial biomass. The former group of nematodes could be classified as migratory and (or) microbrowsers. They may be more attracted to actively growing roots where there may be less microbial activity. In contrast, *Pratylenchus* spp., which is an endoparasite commonly associated with root necrosis, may provide substrate for microbes; and thus is positively correlated with microbial biomass.