

Organic Transition Experiment at the Center for Environmental Farming Systems (CEFS) located in Goldsboro, North Carolina: Effect on the Arbuscular Mycorrhiza Fungal Population Diversity

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One of the important groups of beneficial soil microorganisms in ecosystems, including agricultural ecosystems, is arbuscular mycorrhizal fungi (AMF). These symbiotic fungi function in plant protection, nutrient acquisition, soil aggregation and soil organic matter accumulation. It has been reported that agricultural practices such as tillage and agricultural chemical inputs, can negatively impact mycorrhizal fungi and as a consequence, diminish their potential to benefit the system.

The Organic Transition Experiment at CEFS was set up on land that had been in agricultural production over the last 100 years. Surprisingly, the existing population of AMF is species rich, with over 29 species recovered from the greater, 81 ha long-term farming systems experiment, in which this study is located. These AMF species have been able to co-exist under many conventional agricultural practices and thus may not respond to differential management practices. In the Organic Transition Experiment, no significant treatment effects on the AMF population diversity has been observed to date.

AMF populations were assessed in 2004 from Start 1, treatments 1 through 4 (See Creamer et al, this volume). By this time, two years of transitional treatments followed by two years of organic farming practices had been implemented on all but the conventional treatment, which had undergone four years of conventional farming practices. Soil samples were collected from the geo-located sampling points, in April 2004. Trap cultures were established in the greenhouse and the AMF populations were assessed as fungi that had sporulated in trap culture, after 4 months.

The AMF diversity, as measured by Simpson's Index of Diversity, was not significantly different between treatments. Species richness was high, 5 to 10 AMF species, for all treatments and in all fields. A total of 17 AMF species from 5 genera were recovered. Seven species occurred in all three field locations, six species were restricted to one location and four occurred in two of the fields.

There was one possible treatment effect. The genus *Gigaspora* was missing from the conventional treatment in all three fields. This year we will examine the Start 2 trap cultures for corroborating evidence of this possible treatment effect.