Figure 1



Figure 2



Figure 2: Soil microbial community structure on an organic farm in northwest Missouri. Microbial components are expressed as content of phospholipid fatty acid (PLFA) markers specific for each component. Cnv Orch = conventional orchard and alley (Cnv Alley) with no organic amendments with tall fescue alleys; Org Orch, Org Alley, Org Alley+BC = organically managed orchard, alley and alley supplemented with on-farm produced biochar; Rest Prairie = restored prairie site established in 1995 on sloping landscape with eroded topsoil; Grass = old cool-season grass and forb hayfield with no management; Cultivated = nearby field cropped to corn-soybean rotation with chemical inputs and no cover crop. VAM, vesicular arbuscular mycorrhizae; Actino, actinobacteria; G pos Bac,

Gram-positive bacteria; G neg Bac, Gram-negative bacteria. Source: Based on Kremer et al., 2015. eOrganic News

Figure 3: Soil health index for assessing crop management systems derived using the Soil Management Assessment Framework (SMAF) for soils collected in the Salt River Basin in northeast Missouri. CRP, Conservation Reserve Program acreage; CSG, cool-season grasses; WSG, warm-season grasses; NT, no-till; MT, mulch-till (non-inversion tillage such as disk harrowing to partially incorporate residues left on the soil surface); C, corn; Sb, soybean; Wh, wheat; RCl, red clover; Cont., continuous. Source: Based on Veum et al., 2015. Journal of Soil & Water Conservation 70:232-246.Cont. Sb, Tilled



Figure: 3

*Livestock grazing

Figure: 4



Figure 4: Roundup Ready soybean planted into tall fescue killed with Roundup burndown application (upper left) and not treated (upper right); note difference in apparent plant vigor of soybean due to planting into sod two days post-herbicide application. Soybean plants were excavated and roots cultured on a medium selective for the fungi Fusarium spp. (lower photo); left plate shows proliferation of Fusarium spp. (white circular colonies) on soybean roots from plants planted into Roundup-killed sod due to glyphosate-mediated stimulation of Fusarium spp. on dead fescue that also colonize soybean roots; right plate shows soybean roots not affected due to no glyphosate treatment. Soybean grown in Jemerson silt loam on author's family farm in central Missouri. *Source: R.J. Kremer*