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# Arbuscular mycorrhizal fungal communities associated with organic and conventional onion crops in the Columbia Basin of Washington

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Onion mycorrhizal associations were assessed in conventional vs. organic fields in the Columbia Basin of the Pacific Northwest USA in 2014. Soil was sampled from five sites in each of four conventional and five organic fields prior to planting in March. Arbuscular mycorrhizal fungi (AMF) were baited from each soil by planting seed of the onion cv. Tamara. Plants also were sampled from each field at bulb initiation (mid-June). Onion roots were stained to quantify mycorrhizal colonization, and DNA was extracted for 454 pyrosequencing of AMF communities using 18S rDNA and Glomerales-specific primers. AMF were prevalent in all fields, with no significant differences in colonization of baited roots in soil samples from organic vs. conventional fields (mean ± SE of 77 ± 4 vs. 75 ± 4%, respectively). Baited AMF communities from spring soil samples differed in community structure in conventional vs. organic fields (PERMANOVA Pseudo-$F$ = 4.08, $P$ = 0.02), though AMF richness and evenness did not differ significantly (t-tests and Welch-Satterthwaite t-test $P \geq 0.2$). AMF communities in mid-summer root samples also differed in community structure (PERMANOVA Pseudo-$F$ = 7.92, $P$ = 0.0005), with greater richness (Welch-Satterthwaite t-test $P$ = 0.02) but similar evenness in organic vs. conventional fields. Differences in AMF communities between organic and conventional fields were attributed mostly to differences in relative abundance of *Glomus* and *Claroideoglomus* spp.