**The Effect of Glyphosate on Soil Microbial Communities: Fake News vs. Facts**

Glyphosate (Roundup) is a key component of no-till systems throughout the world, especially for wheat in the Pacific Northwest (PNW). It is relatively safe, tightly bound to soil particles, is broken down by microbes, and does not have a long residual in the soil. However, there are concerns about non-target effects, especially on beneficial bacteria and fungi in the soil. With high-throughput sequencing, we can generate tens of thousands of DNA sequences from a single soil sample and identify all the microbes that could never be cultured. To answer the question: how does glyphosate affect soil microbes, we sampled the fields of four long-time no-tillers across the precipitation zones of WA and ID, over two years. At each farm, we sampled wheat fields with a long history of glyphosate use, and adjacent CRP land with no history of use. We planted the soil with wheat in greenhouse experiments. One half of the pots were terminated after one month with glyphosate at field rates, and in the other half, plants were mechanically clipped. We sampled the soil and rhizosphere and extracted DNA. We continued this for 4 cycles of planting, killing and replanting. DNA was sequenced with Illumina MiSeq and bacterial and fungal sequences were identified and communities were analyzed. For bacteria, the location of the field and the cropping system were the primary drivers of community composition. Glyphosate had a very minor role, often only explaining 1-2% of the variation. Only a small percentage of the bacteria showed a differential response to glyphosate (<1%). More were stimulated by glyphosate use than were reduced. This is due to a greenbridge effect, selecting for communities favored by dying roots. Glyphosate has two greater risks than effects on microbes- the greenbridge effect and the risk of developing resistant weeds with widespread glyphosate use.