2023 Growing Season: How dry was it and did soil health matter?

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The University of Manitoba's Glenlea long-term rotation was established in 1992 to compare conventional and organic systems, both biologically and economically. This experiment used the Glenlea plots to assess the role that soil health plays in water resilience within the forage-grain (perennial) rotation. The experiment consisted of three treatments: organic with composted manure, organic without composted manure, and a conventionally managed system. Soil health was characterized by water stable aggregates, which averaged 75.3c% for the conventional treatment, 80.0bc% for the organic no compost system and 82.6a% for the organic plus compost manure treatment. Soil C in the 0-15 cm soil depth averaged 3.9, 4.2 and 4.5% (NS) for the three treatments, respectively, while microbial biomass C averaged 1476b, 1648a, and 1718a, respectively. Each treatment had three replicates. Each subplot created for this experiment within the main Glenlea plots measured 2m by 1m. Within each replicate, each irrigated subplot had a corresponding non-irrigated subplot which served as a control. Irrigated subplots received 2cm of supplemental water weekly, for a total of 14cm throughout the growing season. Biomass was collected once at flowering and at harvest. Biomass collected at harvest was used to determine yield. While conventional subplots yielded higher than organic subplots, there was a greater disparity in yield between the conventional irrigated and non-irrigated subplots when compared to the organically managed subplots. This suggests that the conventionally managed system may be less water resilient than the organic systems, and the difference may be related to a lower level of soil health (as indicated by organic C and water stable aggregates).