

Immediate Release

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Adapting to Extreme Weather

Extreme weather appears to have become “normal”. Actually, maybe the last 50 years (1960-2010) may have been “abnormal” when you look at long-term climate records. What is considered extreme weather today was more normal several hundred years ago. What should we expect and how can we adapt in the future? Yearly average moisture for Northern Ohio has been 32-36 inches with 42-50 inches in Southern Ohio. The last four years have been among the top ten wettest on record and Northern Ohio averaged 50 inches (excluding Lake Erie affected counties), possibly going to 60 inches. Northern Ohio weather today is more like Southern Indiana weather 30 years ago.

Extreme weather events will change your future farming operation. During wet springs, farmers use large equipment and additional hired help to plant in a shorter time period. Growing winter cover crops with evapotranspiration may dry the soil quicker. Controlled traffic and cover crops also promote firmer soils for timely planting. Research on autosteer and self-propelled robots will allow equipment to get smaller. Smaller lighter equipment operated by robots decreases the weight and compaction factor and operate 24 hours per day. Soon (5-10 years); planting, spraying and harvesting operations may be vastly different than it is today. It is predicted that optimal spring planting will be 5-10 days shorter and harvesting time 5-10 days shorter, but overall, the growing season will be longer. However, average freezing dates may not change much. Timely planting will be critical.

With a longer growing season expected, farmers may plant earlier and use longer season crops hybrids that they harvest later. However, longer crop maturities do not necessarily produce higher yields or higher profits. It depends on rainfall timing (especially during pollination) and growing conditions. Short season crop varieties may produce as much grain as longer growing crop varieties with less moisture. Planting a short season variety, getting a premium for early harvest, cutting drying costs and adding a cover crop to increase carbon in the soil may be more profitable and environmentally sound.

Increased crop residues decrease soil temperatures, beneficial in a drought or during a hot summer. In a hot or dry summer, soil temperatures may be 20-30 degrees cooler under no-till and cover crops compared to conventional tilled soils, conserving moisture lost to evaporation. In Illinois, soil temperatures on conventionally tilled soil reached 140F during a drought in 2014, which is high enough to kill soil bacteria. These farmers were advised to inoculate their soybean fields to reestablish beneficial Rhizobia bacteria for N production. At 100F soil temperature, 15% of moisture is used for growth and 85% moisture is lost through evaporation and transpiration. At 70F, 100% moisture is used for plant growth. For corn production, 75F requires 1 inch water/week, at 85F – 2 inch water/week, and at 95F – 4 inch water/week. Water requirements double for every 10F increase in soil temperature (Elwynn Taylor, 2012).

Since water and carbon dioxide are the most limiting nutrients for crop yields, no-till farming and adding cover crops to increase organic matter conserves moisture and adds soil carbon. With more frequent rains, expect delayed fertilizer applications and with more intense rain events expect more soil erosion. Expect increased water quality issues due to loss of nitrate and phosphorus fertilizer, increased sediment losses, runoff from manure application; followed by warmer summers which promote harmful algal blooms. The best solution to these problems is to plant cover crops to decrease soil erosion, improve soil structure, increase water infiltration, and higher water holding capacity, and live roots to tie up soluble soil nutrients.

Extreme weather will change insect, weeds, diseases, and soil microbe populations. Higher humidity may increase pathogens, insects, and other pests. Warmer winters affects grains storage with increased insects, molds and allergens expected to be major future problems due to increased temperatures and humidity. Increased temperatures and higher humidity may change the efficiency and persistence of herbicides (volatility) and fungicides longevity and effectiveness. Expect grain to have higher energy content due to a longer growing season but lower protein content, which will affect livestock feeding. Maryland farmers in the Chesapeake Bay region using cover crops for the past 10-15 years say they can plant 7-10 earlier due to firmer soils that allow the soil to dry out rather than planting in mud. Maybe that is the future of Ohio farming.