



The urgency of transforming the Midwestern U.S. landscape into more than corn and soybean

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The current agri-food system emerged out of a desire to provide an inexpensive and secure food supply. Yet even before COVID-19, the abundant agricultural production of the Midwestern United States was generated amid a backdrop of increasing farm bankruptcies, declining farm employment and rural communities, and climbing farmer suicide rates. The environmental costs of this system were well established and include Gulf of Mexico hypoxia, elevated sediment and nutrient levels in waterways, and impacts to air quality, biodiversity and climate change. The economic, social and environmental consequences of contemporary agriculture already indicated the need for a wholesale revisiting of the dominant agricultural paradigm of highly specialized and subsidized production.

Early analysis of the impacts of COVID-19 on this system show farmer sentiment about the agricultural economy declining amidst reports of potentially devastating financial impacts (Mintert and Langemeier 2020; Westhoff et al.

2020). Some have even suggested that the financial impact of COVID-19 on agriculture can be equated to the impacts of the Dust Bowl on the Great Plains (Hart et al. 2020). The devastating tragedy of COVID-19 forces all agricultural stakeholders—farmers, consumers, food companies, legislators, and others—to hasten the re-thinking of an already unsustainable production system that lacks resilience. This re-thinking needs to go beyond the voluntary incremental changes and tweaks to localized programs that farmers, NGOs and others are already attempting.

A re-envisioned Midwestern landscape can balance sustainability goals, build the adaptive capacities of rural communities, and strengthen resiliency against the system shocks that the COVID-19 crisis has laid bare. It can also address climate variability, changing consumer demands, and volatile markets that were already placing tremendous pressure on agriculture and rural communities before the ongoing pandemic. To accomplish these goals, we must *increase the diversity of agricultural systems at farm, landscape, and market/supply chain levels*

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so they are more resilient for farmers, rural communities, and the environment. Multifunctional working landscapes could include: incorporating small grains and/or forage crops into extended rotations; replacing some input-intensive corn-soybean acres with perennial bioenergy crops, including agroforestry; integrating grazed livestock into systems that may include feed grains, winter cover crops, or perennial crops/forages; horticultural food crops; and/or increased use of edge of field nutrient loss reduction practices targeted to less productive, highly vulnerable lands. This landscape diversification must be paired with development of local and regional processing infrastructure and markets to allow farmers and food businesses to be financially viable. There must be less reliance on the lengthy commodity supply chains and consolidated markets that the COVID-19 pandemic is exposing as fragile and vulnerable.

To increase diversification at this scale, we need drastic changes that go beyond a mere pivoting of priorities and focus. On the research side, we need more field research and modeling of landscape-level effects of diversification on soil, water and air quality, climate change, and economic and community resilience. We also need integrated research and engagement to understand what will motivate and support change along the agricultural supply chain. This research can inform policy changes that will be necessary to facilitate a transition to a more resilient system. We need to develop stakeholder-informed landscape scenarios at the local, state, and national levels that consider who we want to be as a society and what we value most. Our Extension programs need to support diversification, market development, and strategies to build capacity for resilient communities. This approach will require us to transform our colleges of agriculture to train a workforce to be flexible while also providing programs to local government staff and community development organizations to support a more diversified agricultural economy and landscape.

Of course, research, extension and education are necessary but not sufficient to achieve such large-scale changes. As noted by others (NRC 2010), governmental and non-governmental policy tools that incentivize diversification and de-prioritize the current culture of mono-cropping will be essential. Increased diversification will make the agricultural system more resilient to shocks like COVID-19 or plant/animal pathogens in the future and will contribute to economic, social, and environmental viability. A reimagined future for agriculture that embraces diversity as well as environmental and social wellbeing is one component of the social change this crisis has revealed as absolutely necessary. If not now, when?

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