SCHOOL OF NATURAL RESOURCES

BALANCING CONSERVATION PRACTICES IN AGRICULTURAL LANDSCAPES

By 2050, the world's human population is expected to increase to over 9.7 billion people, which will increase pressures on our local and global food production systems, increase urbanization, and require more infrastructure such as roads and buildings. This continued pressure on our rural landscapes will require innovative approaches to find the balance for humans and natural resource conservation including soil, water, and wildlife.

In recent years, precision agriculture technologies like fertilizer, herbicide, and irrigation variable rate systems, yield monitors, and drones have changed the game for agricultural production in Nebraska and beyond. For example, you do not need to apply a universal fertilizer application across an entire field, but rather use variable rate application system to apply fertilizer at different amounts across a field based on plant requirements. This reduces costs to the producer, especially in recent years when inflation has affected all aspects of farm production. Simultaneously, these precision agricultural technologies can help reduce environmental impacts such as water contamination, soil erosion, and declining wildlife populations. This is where precision conservation can help.

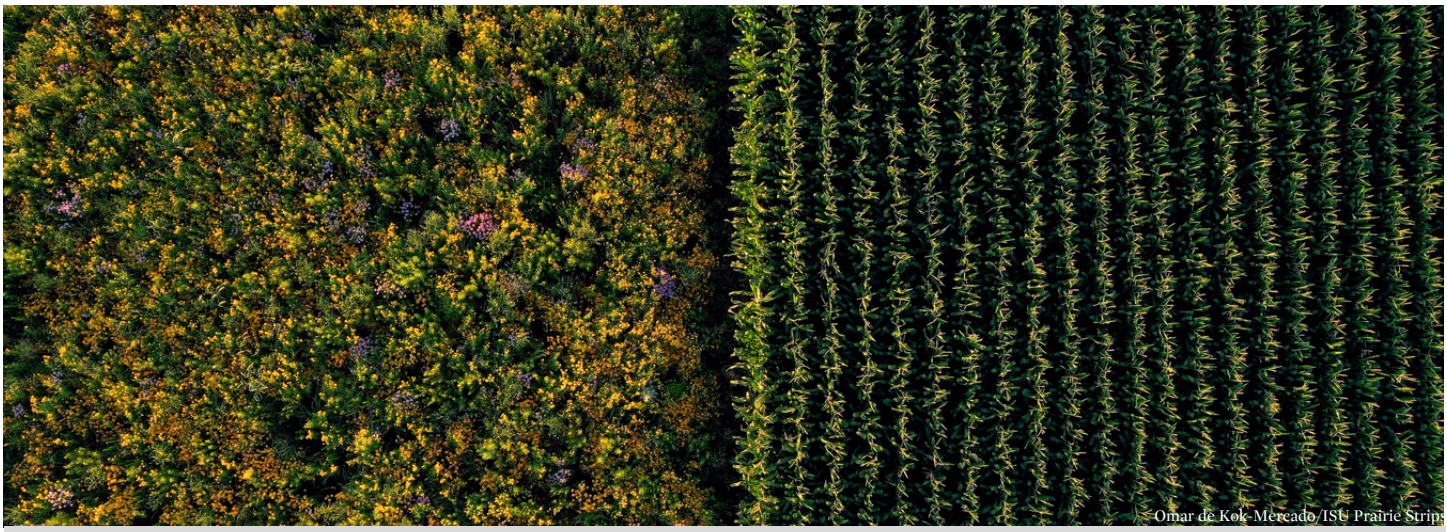
Omar de Kok-Mercado/ISU Prairie Strips

WHAT IS PRECISION CONSERVATION?

Precision conservation leverages precision agricultural tools like yield monitor data and Geographic Information Systems (GIS) to identify areas in fields that can be diversified to optimize financial return on investment while benefiting conservation. One example of precision conservation is switching less productive and profitable portions of a field to a lower input management option. However, implementing a precision conservation approach can be complicated when considering your land management objectives, potential tradeoffs, and any uncertainties that come with new equipment or practices.

WHAT ARE THE CHALLENGES?

In Nebraska, our Applied Wildlife Ecology & Spatial Movement (AWESM) Lab is researching the constraints that may be making it difficult for farmers and farmland owners to to adopt a precision conservation approach on their farms and ranches. From this research, we discovered a few key findings. First, we found that there is inconsistent messaging from conservation professionals about the ways precision agriculture can be applied to agricultural lands, which can be confusing for those new to the practice. Second, financial limitations were the greatest limiting factor to adoption of precision agriculture. Third, farmers and farmland owners preferred receiving precision agriculture information from sources like friends, family, and peers. Finally, the overall satisfaction with conservation professionals increased as farmers and farmland owners engaged with multiple conservation organizations such as federal, state, non-governmental organizations. This latter point illustrates two key points: 1) conservation professionals must work together to showcase various conservation agency programs and demystify what these programs have to offer; and 2) the more collaboration amongst conservation agencies that occurs, the greater the likelihood of improved satisfaction from farmers and farmland owners.



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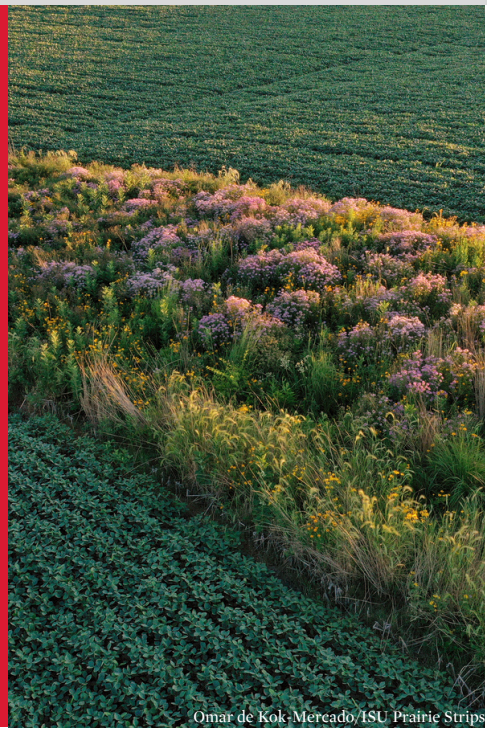
OVERCOMING THE CHALLENGES

In the coming years, we must work together to co-create a better tomorrow for Nebraskans and beyond. Ultimately, we have a grand challenge ahead of us to feed and fuel a growing human population while ensuring the sustainability of our natural resources for future generations. However, it is possible to accomplish the goal of balancing conservation and agricultural production, especially in the era of new precision agricultural technologies. By developing innovative strategies to improve adoption of precision technologies and improving communication and marketing strategies amongst conservation organizations, we can chart a new path to balance conservation and agriculture production. To learn more about this topic, check out our WildAg podcast.

FURTHER READING

Register, M. 2022. Understanding conservation specialists' role in the adoption of precision agriculture in Nebraska.

Winter, C. 2023. Understanding the factors affecting Nebraskan farmers' and landowners' decision to adopt precision agricultural programs.



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