Science Societies

Cropping pattern changes restrict delivery of agroecosystem services

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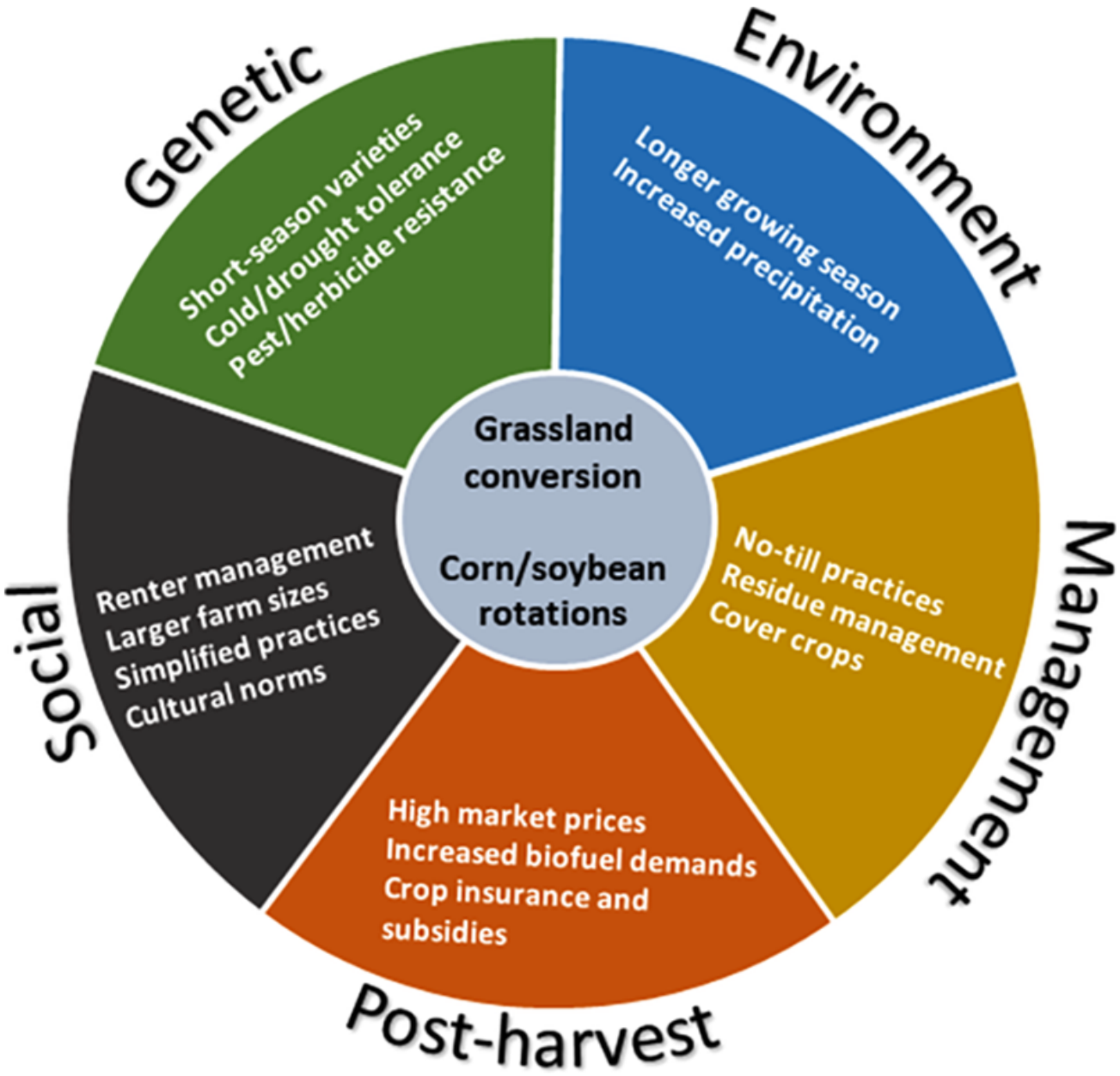

Conceptual diagram outlining some of the factors influencing cropping pattern changes in North and South Dakota.

Cropping patterns are changing in the Northern Great Plains, USA to meet increasing global demand for food and fuel. This region has historically been home to a diverse landscape, including row-crop agriculture, rangelands, and wetlands, and land use changes are affecting the ability of these systems to deliver ecosystem services.

A recently published literature review in *Agronomy Journal* comprehensively examines cropping pattern changes in eastern North and South Dakota. Researchers describe two major trends, agricultural expansion (i.e., more land in agricultural production) and rotation simplification (i.e., fewer different crops being grown). Numerous factors are influencing these changes, including genetic advances, changing environmental conditions, innovative management practices, and socioeconomic pressures.

Researchers contextualize the effects of these changes using the framework of agroecosystem services. The cropping pattern changes show a disproportionate emphasis on provisioning services in the form of crop production. Important regulating services associated with air, water, and soil quality; cultural services associated with the non-material benefits of a diverse landscape; and supporting services associated with primary production, nutrient cycling, and water availability were neglected. The researchers conclude that current trends will ultimately reduce agroecosystem sustainability, resistance, and resilience to changing conditions.

Dig Deeper

O'Brien, P.L., Hatfield, J.L., Dold, C., Kistner-Thomas, E.J., & Wacha, K.M. (2020). Cropping pattern changes diminish agroecosystem services in North and South Dakota, USA. *Agronomy Journal*, *112*. **https://doi.org/10.1002/agj2.20001**

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