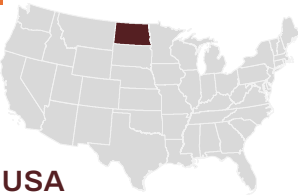
Summary

Regenerative practices can enhance ND's ecosystem vitality and farmers' incomes, creating resilience to the landscape economy

A narrow, yet economically attractive, transition to regenerative agriculture can help ND farmers improve soil fertility and bottom lines in the next decade.



USA
North Dakota

Current state of agricultural landscape

Agronomic & Environmental

- **Short and increasingly unpredictable growing season,** degradation of aquatic ecosystems, and low nutrient availability due to soil salinity and acidity.

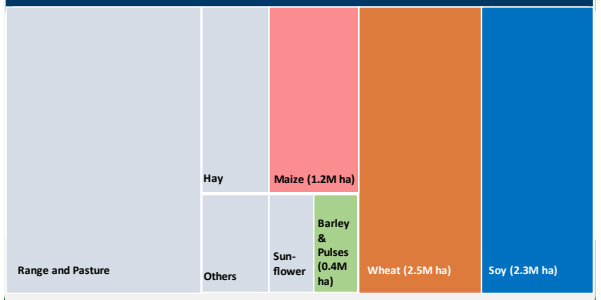
Economic

- **Volatile net farm income from yields and market price shifts coupled with upward pressures on land rates.**

Social

- **Misaligned public incentives to stimulate regenerative farming, hidden health costs associated with agrochemical exposure, and gradual loss of rural population as farms consolidate.**

Current agricultural land-use at landscape level



Transition pathway hypothesis

Diversify crop fields and integrate grazing

- **Introduce multiyear dynamic crop rotations intercalated with adaptative multi-paddock grazing and harmonize planted area for each crop at farm and landscape.**

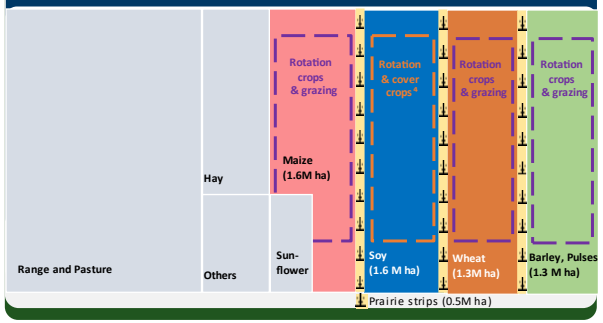
Manage edge of field for biodiversity

- **Introduce prarier steps and manage edge of field to reduce soil erosion, shelter and foster habitat for pollinators and wildlife, and provide supplemental grazing for livestock.**

Minimum to no soil disturbance

- **Foster regenerative practices to keep live roots on the ground, facilitating water retention and nutrient distribution.**

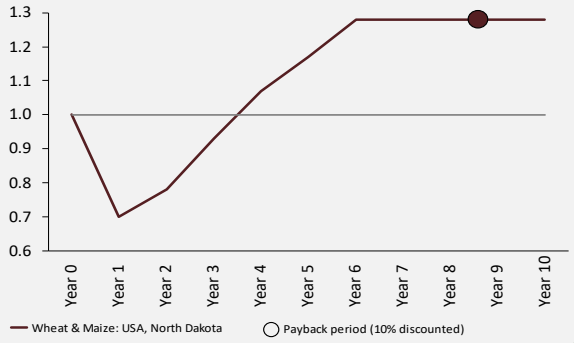
Alternative land-use at agricultural landscape level



Results of economic modeling

- **Over 10 years, the cumulative effect of a transition to regenerative agriculture is positive with an average added value of 32 USD/ha and a payback[3] by the mid of year 8 (10% discounted).**
- **Profitability lowers during an interim period and reaches a point of equilibrium 30% higher after year 7.**
- **The higher profitability levels after transition are associated with declines in fertilizers and agrochemical inputs, slight increases in cereal crop yields, and revenues from land rents or feed sources for grazing.**

Change in net profitability over a 10 years period for proposed transition pathway (alternative state/current state) indicated in relative terms



Implications and recommendations

- **A successfully executed shift to regenerative practices can boost both the landscape's vitality and farmers' income over time.**
- **The environmental gains and climate resilience from adopting regenerative agricultural practices can compensate for a challenging business scenario.**
- **For transition to be possible, we need:**
- **Provide farmers with in-depth knowledge of complex growing systems, including multi-year crop sequencing, crop-environment interactions, and grazing dynamics.**
- **Offer financing options, in addition to current public support, with insurance and repayment terms that address potential setbacks during the adaptation phase.**
- **Create additional revenue streams, such as carbon credits or premiums, stimulated by the private sector to improve the short-term business case for growers.**

Note: [1]Net Present Value 10% rate. [2]Costs and returns will vary significantly based on the farm's portfolio. Model focuses on the agricultural landscape and do not contemplate eventual investments in new landscape level infrastructure and market channels. Conservatively assumes no carbon revenues or green premiums. Landscape transition happens all at once. [3] When accumulated profits from alternative state surpasses those from current state. Systemiq analysis for **Regen10.org**