Protecting Soil Resources by Improving the Wisconsin Farmland Preservation Program

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Executive Summary: Soil erosion is a continuing problem in Wisconsin (WI), with erosion rates at double the national standard and increasing over time. Among other environmental concerns, this erosion impairs cropland productivity and pollutes waterways. Wisconsin's Farmland Preservation (FP) program is the state's largest program for maintaining soil erosion conservation standards. To combat soil erosion, we recommend improvements to the FP program incentives and conservation standards. The FP program sees substantial enrollment loss from contract expirations, so we recommend changing FP timespan from 15-year contracts to 5-year segments with automatic renewal. Additionally, to further increase enrollment in FP, we recommend increasing enrollment incentives by scheduling annual increases in FP tax credits indexed to inflation. Finally, we recommend tilling conservation standards be added to FP guidelines to require no-till or strip-till farming on enrolled acreage as a major step to decrease soil erosion.

I. Soil erosion and Wisconsin

Soil erosion decreases the acreage and quality of farmland, negatively impacts waterways, and increases flooding risk. WI has over 7 million acres operating as cropland (USDA 2017) and approximately 34 million tons of cropland soil eroded due to runoff in 2015 (USDA 2018). Erosion in WI was almost double the national average in 2015, and, while national erosion rates are decreasing over time, WI rates are increasing (USDA 2018). It can take between 100 to 500 years for an inch of lost topsoil to form, and it's estimated that nutrient loss through soil erosion can cost farmers $51 to $64 per acre in manure to compensate (WI DATCP 2017b). Erosion comes with many other costs, including:

- Waterway pollution, causing algal blooms at the detriment of aquatic ecosystems (Issaka and Ashraf 2017)
- Decreases in amount of prime farmland in WI (USDA 2018)
- Decreases in soil carbon sequestration, which increases dangerous greenhouse gasses in the atmosphere (Lal 2004)
- Decreases in pollinator bee populations (Shuler, Roulston, and Farris 2005)

II. Farmland Preservation Program

Wisconsin's Farmland Preservation (FP) program is the largest state-run program that addresses soil erosion and prevents active soil acreage loss to commercial development (WI DATCP 2018b). FP enrolls farmers in 15-year contracts to zone acreage as farmland and to apply conservation standards within those acres. However, enrollment has decreased from 2.9 million acres of WI farmland in 2010 to 2.3 million in 2017 due to contract expirations without renewal (WI DATCP 2018a). According to a 2017 survey, farmers are not renewing because they do not want to limit the use of their land for 15 years (57% of farmers), and the tax credit is not high enough (31% of farmers) (WI DATCP 2018a).

III. Farmland Preservation lacks sufficient tilling standards

Farmers must demonstrate compliance with state conservation standards to qualify for FP, but these guidelines scarcely address a major contributor of soil erosion: conventional tilling practices (WI Legislature 2009, 2010). The alternative tilling practices of no-till and strip-till, where none or only the portion of soil containing the seed row is tilled, prevent soil erosion and slow land degradation by minimizing soil disruption. In addition, these minimal tilling methods decrease time and diesel costs to farmers; strip tilling uses about half-as-many gallons of diesel per acre as conventional methods (Arriaga 2014). While usage of minimal tillage practices have increased since 2012, approximately 40% of WI cropland still undergoes conventional tilling, with corn accounting for the largest share of conventional tilling by acreage (USDA 2017).

IV. Policy recommendations

Below we provide three major options to mitigate the many effects of soil erosion by increasing conservation efforts among farmers.

i. Change FP timespan from 15-year contracts to 5-year segments with automatic renewal

Enrollment lasts indefinitely but could be cancelled at the end of any 5-year segment.

Advantages

Decreased length of time commitment for the farmer. State maintains enrollment by preventing loss from contract expiration.

Disadvantages

Higher administrative resources to handle 5-year segments. Farmers may cancel the contract earlier.

ii. Schedule annual increases in FP tax credits by indexing to inflation

Tax credits for FP are set at $5, $7.5, and $10 per acre over three categories, but have not been updated since July 2009 (WI DATCP 2016). As of January 2019, indexing tax credits would increase credits to $5.85, $8.28, and $11.7.

Advantages

Farmers would be assured a tax credit that scales over time and policy-makers would not need to adjust the credit continuously for inflation. Higher incentives should increase enrollment.

Disadvantages

Greater cost to the state; payments would cost an additional 17% in 2019 ("CPI Inflation Calculator" n.d.), or $2.72 million extra based on 2016 payments (WI DATCP 2017a).

iii. Include tilling standards for FP (Chapter 91) to require no-till or strip-till farming on enrolled acreage

We recommend stipulating no-till or strip-till practices for farmers to receive FP funds.

Advantages

Decreased soil erosion and associated benefits explained above. If all cropland complied with these standards, we estimate that erosion would decrease by more than half (tons per acre) in the first year and continue to improve in subsequent years as soil health increases (Ruark, Kelling, and Good 2014).

Disadvantages

High start-up costs associated with mechanical changeover. Costs to farmers can be mitigated by committing additional state funding.

Wisconsin's FP program is the best tool for improving soil health sustainably, and here we outline improvements to the three main problem areas of the program. We recommend implementing all three policy options to maximize conservation efforts and soil health.

Appendix

Potential problems and solutions with minimal tilling

The scope of the above changes is restricted to FP participants by modifying Chapter 91 to include tilling standards that are stricter than NR 151 (WI Legislature 2010). As a more robust option, changes to statewide conservation standards could apply to all farmland in the state by modifying NR 151. NR 151 of the Wisconsin Administrative Code for the Dept. of Natural Resources only includes restrictions on tilling adjacent to waterways but could be expanded to require minimal tilling.

Resistance to minimal tilling practices is largely due to a stressed planting timeline at the end of winter. Tilling turns up the soil, drying out the top layer to allow more rapid seeding, but also decreasing soil health. Our proposal would still allow strip-tilling, which also allows for rapid seeding, though only in very limited areas, with the intent to address this concern.

Another widespread misconception of minimal tilling relates to expected drops in crop yields. Data shows that while a small drop does occur for both methods in the first year, continued use of minimal tilling actually increases crop yields relative to conventional tilling (Lauer 2016).

Mechanical changeover costs can run up to $100,000 to begin strip-tilling operations, but savings in fertilizer and diesel costs could make up this amount in only a few years depending on the size of the farm (Zemlicka 2014). As stated in the memo, we recommend financial incentives to help farmers purchase, lease, or share equipment.

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