Cedar Creek Ecosystem Science Reserve

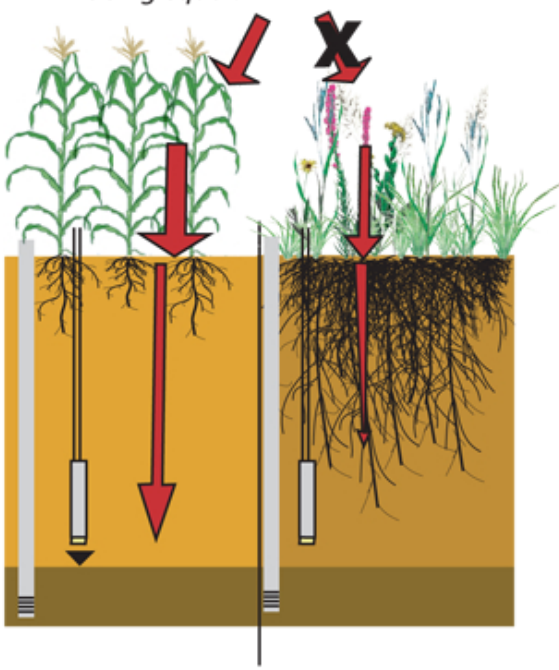
Biofuels as an Alternative Energy Source

There are right ways to grow biofuels and wrong ways. Properly done, biofuels from Minnesota restored prairies promise to provide perpetually renewable energy while (1) purifying water before it reaches the aquifers, (2) reducing or eliminating chemical use, (3) using land not designated for foodstuff, (4) removing carbon dioxide from the air, and (5) providing a large expansion of habitat for wildlife. Cedar Creek Ecosystem Science Reserve conducts this research with the support of the Legislative-Citizen Commission on Minnesota Resources (LCCMR) and the United States Geological Survey (USGS), with further background funding from the National Science Foundation (NSF) and the University of Minnesota..

The Clean Water Potential of Prairie Bioenergy

Prairies have important ecological properties that improve the quality of water reaching shallow groundwaters. Properly placed prairie biofuel buffers in agricultural landscapes around the state can absorb agrochemicals generated by row crop production.

Diverse working prairies are more productive and requrie less maintenance and little or no chemical inputs, all other things being equal.



Biofuel cropping can become a safe substitute for prescribed burning.

Selected Hypotheses

- Working prairies have large, dense root systems which provide greater opportunity for agrochemical uptake.
- Working prairies are actively growing and taking up soil water for the entire growing season thus increasing soil water storage.
- Working prairies increase soil carbon content, which slows the movement of water and dissolved contaminants.
- Working prairies host a healthy microbial community, which improves prospects for utilizing nutrients and biodegrade organic agrochemicals.

Future Potential

- Further instrumentation and contaminant testing at the existing site.
- Expansion at landscape scales with instrumentation and further hydrological/purification testing.
- Planning and implementation at the state/regional scale.
- Enhancement across the range of habitats, including brushlands, woodlands, and wetlands.
- Integration of biofuel production with other ecosystem services, including water quality, water quantity, wildlife, carbon sequestration, and soil restoration.

Legislative-Citizen Commission on Minnesota Resources

USGS science for a changing world

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