Agri-Environment Bulletin

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A newsletter from Manitoba Agriculture, Food and Rural Development

Burying Phosphorus May Help Keep It in the Field

The Watershed Evaluation of Beneficial Management Practices (WEBs) at Deerwood, Manitoba has greatly improved our understanding of phosphorus (P) movement from agricultural land to surface water. One of the major revelations stemming from the collaborative work, undertaken by staff of the University of Manitoba and the federal and provincial governments, centers on tillage practices. The "Twin Watersheds" study of adjacent conventional till and conservation till fields found that the adoption of conservation tillage can lead to accumulation of P near the soil surface due to fertilizer placement and residue build-up. Following the 4Rs of nutrient management (Right Source at the Right Rate, Time and Place) remains strongly recommended for agronomic, economic and environmental reasons. In this context, however, such sound practice may not be enough. It turns out that crop residue is an additional source of P to runoff. Phosphorus from crop residue is mobilized by freezing, thawing, degradation and spring snowmelt.

Findings from recent research at the WEBs site reveal that re-introducing tillage, on a rotational basis, may mitigate this problem. Tilling every second year, with a total of four passes over five years, appeared to reduce the amount of P escaping the field in runoff during snowmelt.

However, here's the catch sometimes faced when tackling agri-environmental challenges – there can be unavoidable trade-offs. While rotational tillage appears to have reduced P loss from the formerly conservation till portion of the Twin Watershed, improvements in nitrogen (N) management from adopting the conservation approach may have been sacrificed in the process.

This case typifies the complex relationship between agricultural landscape and practice with climate and nutrient dynamics on the Prairies. In such circumstances, the proper goal for environmental stewardship may have to be optimizing outcomes overall rather than targeting a single problem.

Figure 1. Researchers assessed the impact of various tillage treatments on runoff water quality at the WEBs site near Deerwood, Manitoba.

What agri-environmental news is important to you?
Email agrienv@gov.mb.ca with your ideas and suggestions for future articles.

Shelterbelts Provide More Than Ecological Benefits

With funding from *Growing Forward*, Manitoba Agriculture, Food and Rural Development has partnered with Stanley Soil Management Association to explore the practice of maintaining shelterbelts to provide ecological and societal services that are not well understood.

Shelterbelt trees and shrubs protect land against wind and soil erosion. They protect waterways and roads from extreme weather and provide protected habitats for local wildlife. All of these things have a great ecological impact on a community. In addition, the study is also demonstrating direct benefits to the people within the community.

The social benefits of shelterbelts include the provision of local landmarks, family legacy and community identity. Trees add beauty to a community and they reflect memory and heritage values that enhance community spiritual well-being and social cohesion. They also provide opportunities for diverse land use and recreation such as bird watching, hunting or fruit picking.

A survey was mailed to 300 randomly selected farmers and non-farmers in the area. The survey was to assess the community's perception of the social and cultural benefits of shelterbelts. The survey showed:

- Shelterbelts are strongly associated with agriculture (soil protection, snow collection and agricultural systems' resilience).
- Sixty-four per cent of the community see themselves as the main beneficiary of shelterbelts.
- Fifty-five per cent of the community see the removal of shelterbelts as having a negative impact on a community.
- Eighty per cent of the community has great appreciation of shelterbelts.
- Sixty-four per cent of the respondents see shelterbelts as highly connected to their identity.
- Sixty-four per cent noted their appreciation of shelterbelts mainly came from family.

The survey indicated that social and cultural values associated with shelterbelts differ greatly among cultural groups. Because these social benefits are largely intangible, they could easily be lost. Ongoing education and awareness about the benefits are important for landowners and rural communities as a whole. Shelterbelt maintenance currently relies on farmers' stewardship. Without that stewardship, there's nothing in place to protect shelterbelts.

The enhancement of agricultural systems mainly depends on the collaboration and commitment of stakeholders to create a shared vision of production and conservation. The ultimate goal is to strategically manage shelterbelts for the current and future benefit of all rural and farming communities.

Figure 2. Shelterbelts provide ecological and societal benefits.

Important Dates and Notices

A free composting webinar is held the first Wednesday of each month. Please contact van.doan@gov.mb.ca for more information.