

Alberta Phosphorus Management Tool

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Key Points

- The Alberta Phosphorus Management Tool (APMT) is currently being developed as part of the Alberta Phosphorus Watershed Project.
- The APMT is a risk assessment tool to help minimize environmental risk associated with the management of phosphorus (P).
- The risk assessment tool evaluates flooding, run-on and run-off surface water flow, nutrient accumulation, and facility management to determine the risk of P loss.
- The APMT evaluates a farming operation's management practices, facilities and their landscape factors to determine how they may be impacting the potential for P loss and it then identifies beneficial management practices (BMPs) that can be adopted to reduce the opportunity for loss.

Introduction

Phosphorus (P) from manure or inorganic fertilizers is essential for crop production; however, if not managed effectively, P can be transported to water bodies via surface run-off. Phosphorus is generally the limiting nutrient for plant and algal growth in fresh-water systems. Increased aquatic plant and algal growth can significantly deplete oxygen levels when these organisms die and decompose, negatively affecting aquatic animals. Blooms of blue-green algae (cyanobacteria) can also release toxins that are harmful to aquatic life, livestock, wildlife, and humans if they ingest the water.

Beneficial management practices have been developed to manage nutrient losses from crop and livestock production. However, there is no provincial assessment tool to evaluate the risk of P loss from agricultural operations. Alberta Agriculture and Rural Development (ARD), the Alberta Livestock and Meat Agency, and the Intensive Livestock Working Group initiated a 3-yr project (Alberta Phosphorus Watershed Project) to develop and evaluate a phosphorus risk assessment tool.

The APMT is currently an Excel-based risk assessment tool developed to help minimize environmental risk associated with the management of P. The purpose of the APMT is to identify and assess, at a farm operation-scale, current management practices, facilities, and landscape factors contributing to P loss. Ultimately, the tool will identify BMPs that can be adopted to improve nutrient-use efficiency and/or reduce the opportunity for P loss.

APMT Development

The tool was developed using key elements of existing nutrient management resources in Alberta. These resources included the Environmental Farm Plan, the Nutrient Management Planning Guide, Natural Resources Conservation Board's Environmental Risk Screening Tool, the Wintering Site Assessment Tool, the Manure Management Planner, and the Alberta Farm Fertilizer Information and Recommendation Manager. It also incorporates elements from the Alberta Soil Phosphorus Limits Project as well as phosphorus indices and risk assessment tools from a variety of other jurisdictions in North America. Subject matter experts were consulted to ensure questions used in the tool were appropriate and sufficiently addressed P loss in Alberta.

The APMT evaluates the potential risk of flooding, run-on and run-off surface water flow, nutrient accumulation, and facility management on the loss of P. It also evaluates farm facilities and practices with questions grouped into a number of different sections. Some sections are applicable to all types of agricultural operations, while others are relevant to specific livestock or cropping activities. The producer only completes sections that are relevant to his or her operation. Risk is assessed based upon the answers to the questions, which fall into either a yes/no or low-to-high risk category ranking. Each answer has an assigned level of risk. How a producer answers a question will influence whether or not they are required to answer subsequent questions. Each question also includes a listing of potential BMPs to address the identified risk, as well as a description of the 'potential concern' of the question, i.e., why is the question being asked with respect to P loss.

APMT Testing and Delivery Process

Two pilot watersheds were selected in which to test and evaluate the APMT: Tindastoll Creek Watershed and Acme Creek Watershed. We have been working in partnership with Red Deer, Kneehill, and Mountain View counties to pilot the APMT with producers. We have been meeting with producers to go through the assessment to evaluate their P loss risk and discuss BMP implementation. Based on the farm visits and producer feedback, the assessment tool is updated.

A delivery process, which includes several key steps, has been developed to build a relationship with producers in order to pilot and evaluate the APMT:

- Project team members meet with producers to explain the project, the risk assessment tool, and the APMT process. Fields and facilities managed by the producer are identified and a quick risk assessment of P loss is conducted. The producer is then made aware of the information needed for the follow-up meeting.
- Team members follow up with the producer to complete the APMT. Feedback collected from the interviews is used to improve the APMT and delivery process.
- A summary of the APMT risk assessment findings is provided to the producer on a third visit. The summary identifies risks, and potential BMPs to address the risks. The team then, if the producer is interested, discusses potential BMPs and assists with BMP implementation.

We are currently at the mid-way point of this project and the Excel-based tool is being tested by users, and improvements are identified and implemented as the tool is used. We hope to get more people involved with testing and evaluating the APMT in 2015.

For more information on the Alberta Phosphorus Watershed Project, please refer to the project website: [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/irr14541](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/irr14541)