# 1 Introduction

## 1.1 Goal of the Tri-Provincial Manure Application and Use Guidelines

The goal of the Tri-Provincial Manure Application and Use Guidelines is to provide a set of recommended practices supported by science-based information to help ensure the sustainable use of manure as a fertilizer across the Prairie region.

## 1.2 Manure Management Principles

The following principles are accepted by the three Departments of Agriculture across the Prairie Provinces as the basis for sustainable manure management.

- Sound manure management requires annual planning and proper record keeping.
- Manure application rates will depend on the type of manure and nutrient availability, and should be calculated using results from annual soil and manure analysis to meet crop nutrient requirements.
- Manure application should account for the season, weather conditions and site-specific conditions relating to soil, topography and water.
- Manure application equipment should be calibrated to ensure consistent and appropriate delivery rates of manure.
- Manure should be managed in a way that maximizes crop nutrient utilization and minimizes negative impacts to soil, water and air resources.

## 1.3 Benefits of Manure

Livestock manure is a valuable resource. It is an effective source of plant nutrients and organic matter, which can be used to improve crop production and soil quality.

Using manure as a fertilizer returns nutrients to the land for crop production. Applying manure correctly:

- increases crop productivity and yield
- supplies macronutrients and micronutrients required for crops
- provides nitrogen (N) throughout the season, potentially increasing the protein content in the crop
- increases microbial activity, which can increase the availability of nutrients
- increases the organic matter content of the soil, which provides the following benefits:
  - improved soil structure
  - increased water infiltration and water holding capacity, resulting in reduced water loss from runoff and increasing water availability to the crop
  - increased cation exchange capacity (the ability to hold nutrients)
  - reduced wind and water erosion

## 1.4 Manure Management Challenges

All nutrient sources, whether commercial chemical fertilizer or livestock manure, must be managed to ensure that soil, water and air quality are not degraded. However, there are additional challenges to using manure effectively as a fertilizer. These challenges include:

- The moisture and nutrient contents of manure are highly variable, making it difficult to estimate nutrient availability without a representative manure analysis.

- The nutrients in manure are rarely "balanced" to meet all of the crop's nutrient requirements. For example, when manure is applied to meet the crop's N requirement, other nutrients such as phosphorus (P) and potassium (K) are simultaneously applied at rates that, in many cases, do not match the crop's requirements.
- The low nutrient content per unit weight or volume of manure limits the distance that manure can be transported economically.
- Manure can be a considerable source of odour during land application.
- Because manure may contain pathogens, added care must be taken to ensure it does not enter surface and ground water.
- Manure storage, handling and application practices will be affected by weather.