COMMERCIAL FERTILIZER MANAGEMENT FOR CROP PRODUCTION

Nutrient Management

Why should you be concerned?

Nutrients from either commercial fertilizer or manure are important inputs for crop production. Nutrient management planning helps to:

- Optimize production at a reasonable cost; and
- Minimize the risk of nutrient loss from agricultural lands.

There are environmental concerns associated with nutrients lost from the farm. When certain nutrients, particularly phosphorus, enter surface water, they stimulate the growth of algae and aquatic plants. The death and decay of large colonies of algae, called blooms, deplete oxygen in surface water which can kill fish. Blooms of certain algae can also release toxins that are harmful to aquatic life, livestock and humans if they ingest the water.

Nitrates are highly soluble in water. After snowmelt, heavy rain or inaccurate or poorly timed irrigation, excess water can move down through the soil, carrying nitrates past the root zone to groundwater. Elevated levels of nitrate in groundwater that is used for drinking poses a health concern because of the direct link to Blue Baby Syndrome in infants.

Fertilizer management practices that can contribute to nutrients reaching surface water through runoff or groundwater through leaching include:

- Application at a rate that is higher than what the crop requires;
- Inappropriate timing of application; and
- Inappropriate method of application.

Improper and inefficient use of agricultural nutrients can also negatively affect air quality. Under saturated soil conditions, nitrogen from soils, manures and fertilizers can be lost to the atmosphere as nitrous oxide, a greenhouse gas.

What can you do?

1. Apply nutrients to meet crop requirements based on soil tests, fertilizer analysis, crop type and target yield. Adjust for nutrient contributions from other sources (e.g. manure, legume crops).
2. Consider the following before deciding on the timing and method of nutrient application:
    - Will nutrient availability be optimized?
    - Is the risk of nutrient loss minimized?
    - Are the limitations (e.g. steep slopes) and sensitive areas of each field (e.g. surface waterbodies) accounted for?
3. Calibrate application equipment to deliver target rates to meet crop requirements. Check equipment to ensure that it is in proper working order prior to and during field activities.
4. Include crops in the rotation that can readily take up surplus nutrients from the soil, including nutrients located deeper in the soil. The nutrient uptake potential is greater for crops that have dense and deep rooting systems that persist for a longer period throughout the growing season (e.g. forage grasses). Avoid consecutive years of crops that receive heavy fertilizer applications and have less vigorous rooting systems.

5. For irrigated crops, avoid build-up of surplus water in the soil, due to inaccurate or excessive irrigation or due to irrigation prior to major precipitation. Consider split fertilizer applications during the growing season to avoid high soil nutrient levels at any one time.
6. If you apply manure to your land, consult Section B18.
7. Use this worksheet to evaluate how well nutrients are managed in your operation.
8. Contact your local GO Office for additional information and support, or other appropriate agricultural extension specialist.