

# M&R FEEDS AND FARM SUPPLY

A Division of Brent Clifford Feeds Limited.

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## Understanding Your Soil Test Results

Having a soil test done is a great way to prepare for the 2013 cropping season. A soil test basically measures the ability of the soil to provide each nutrient to the soil solution. But what do the results really tell us?

### pH/BpH

The primary importance of the soil pH is its influence on nutrient availability. A pH of 6.8 is optimum; however most plant nutrients are most available between soil pH of 6.0 and 7.5. When applied to soil outside this range, fertilizer is less efficient. BpH is the Buffer pH, or the soil's ability to resist change in acidity. A soil's buffering capacity changes depending on content of clay, organic matter, and base saturation. The lime recommendation for low pH soil is based on BpH value.

**Organic Matter** is measured as a percent by weight. The typical range of organic matter is 2-6%, but an ideal target would most depend on the clay percent of a soil. The value of organic matter should not be underestimated, as it enables better drainage and water holding capacity, improves compaction resistance and recoverability, provides food for microbial populations, and increases CEC thus holds more nutrients.

Clay%	10	20	30	40	50
OM% target	3	4	5.5	7	9

**Phosphorus** – An ideal target would be 20 ppm, as soil testing higher than this does not need to rely on fertilizer for optimum yield. However, as phosphorus moves very little in the soil solution, adding a planter-placed starter fertilizer is often sound practice.

**Potassium**- Maintaining soil test potassium at or above 120 ppm would be desirable. Potassium is more mobile in the soil solution than phosphorus; therefore broadcasting is an effective application method.

**Magnesium**- OMAFRA suggests that soil test magnesium should be 100 ppm or greater; however maintaining a good balance between potassium and magnesium is also important. It is ideal for magnesium to be approximately 2x potassium test to minimize potassium-induced magnesium deficiency.

**Calcium**- Where soil test in the optimal pH range, calcium levels are usually fine. It is common for Ontario soil to be between 1000 and 4000ppm. When calcium is required, lime or gypsum is the most common broadcast source. Zinc, Manganese and Index Values- Zinc and manganese are two nutrients that are less available as pH rises, therefore an index value is also calculated which factors in soil pH. A general rule of thumb is that the index values for both nutrients should be greater than 15.

**Sulphate/Sulphur**- Similar to nitrogen, sulphur can also undergo many changes. The sulphate form is plant available and is mineralized by bacteria. Typically, tests greater than 10 ppm do not require additional S inputs.

**Copper, Iron and Boron**- Copper and iron are usually abundant in Ontario soils. For boron there is a fine line between adequate and toxic, and for the major cash crops it is not usually required. Boron testing of alfalfa fields and some vegetable crops is important though, as it can be required to optimize yield and improve quality.

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**Nutrient recommendations** may differ depending on approach or philosophy. A 'Sufficiency' approach, upon which the OMAFRA recommendations are built, considers crop response and is best for short term rent farms, or when crop value is low and/or fertilizer prices are high. The 'Build and Maintain' method desires to increase soil fertility to the point that yield should not be limited, and is maintained at these levels. It is best utilized for long term operations or when the ratio between grain and nutrient prices is favourable. 'Crop Removal' provides nutrient additions that match harvest removals and should maintain fertility over time and the 'Base Saturation' recommendation attempts to balance the cations K:Mg:Ca in an optimum ratio.

**Lime Recommendations-** The recommended amount of lime assumes an Ag Index of 75 of the liming product, and is based on the soil BpH and target pH for a specific crop or rotation. Where lime is required and soil magnesium is <100ppm, either dolomitic or calcitic lime may be used. Of course, a fertile soil is not necessarily a productive soil; physical and biological properties are also important, as are favourable weather conditions for optimum growth. However managing soil chemical properties to ensure yields are not limited by plant nutrients is an important part of the equation to optimize production.

For more information please contact Brian and Brett Coughlin at M & R Feeds Micksburg:

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