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Soil Testing

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## Micronutrient Supplements in Potato Fertilizers

### Introduction:

In the process of maximizing yield and quality, potato growers must examine every aspect of their production management system, including their fertility program. One aspect of potato fertility is the need for micronutrients.

Traditionally, potato producers in Prince Edward Island have assumed that their crops will receive an adequate supply of micronutrients; either from natural reserves in the soil or as by-products from other materials applied to the land (for example: in fertilizers, manures, limestone, or spray materials). It is important to recognize a crop's need for micronutrients, either as additives in fertilizers or as foliar sprays.

### The Need For Micronutrients:

Historical data from survey studies and research conducted in Prince Edward Island from 1979-1985 has indicated that a response to applied micronutrients on potatoes can seldom be expected. Similar studies conducted more recently have shown varied responses in yield and overall crop quality to micronutrient applications. However, when a micronutrient problem is noted, the elements which are most often deficient are copper, zinc, or boron. Iron and manganese are naturally plentiful in our acidic podzol soils and almost never approach the deficiency level.

The soils which most frequently show micronutrient deficiencies are those which have been heavily cropped and are physically degraded and eroded; whereas those which have received good rotational practices and which have good fertility levels and physical structure seldom are deficient in micronutrients.

The best way to predict soil micronutrient deficiencies is by soil testing. This is often routinely done in the Central and Mid-Western States and Provinces where soil and climate conditions are more predictable than those in Prince Edward Island. Unfortunately, **soil tests for most micronutrients appear to be of limited value in predicting micronutrients deficiencies in the Atlantic Provinces.** The most reliable method of assessing micronutrient sufficiency/deficiency is by plant tissue analysis.

### Recommendations:

At present, there appears to be little justification for widespread use of micronutrient supplements in fertilizers, except in cases where soils have been over-cropped and degraded. If a grower wishes to add micronutrients, no harm should occur and it can serve as "insurance" against potential deficiencies. It should be noted, however, that this insurance can cost \$40-\$60 per hectare and the probability that the potential benefits will justify the cost is questionable in most cases.

### Specific points to consider include:

- Add micronutrient supplements to fertilizers only if fields have been heavily cropped or have had micronutrient deficiencies confirmed by plant tissue analysis in previous years.
- Supplement fertilizers only with micronutrients known to be deficient in our soils (for example: Cu, Zn or B).
- Add micronutrients to fertilizers only at recommended rates. **Just because a little is good, it doesn't mean a lot is better.** Toxicities can easily occur with some micronutrients.

- Foliar application of micronutrients has shown some merit in being a beneficial method of micronutrient application. Foliar applications may also provide the micronutrient. It is important to note however that foliar sprays may lead to leaf burn due to high salt concentrations if applied at excessive rates, and therefore, may require a few applications over the season. Plant foliage must also be large enough to provide enough surface area for the spray to attach and dry onto to be absorbed by the plant, or the crop is likely to not demonstrate any benefit from the micronutrient application.
- **Monitor the micronutrient status of fields each year by plant tissue analysis.** If deficiencies are found, they can be corrected that year by foliar application of nutrients. In any case, the confirmation of deficiencies can be useful for subsequent crop years.

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