

# Soil FACTSHEET



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## Do You Need Micronutrient Fertilizers?

Micronutrients, or trace elements, are those elements required by crops in relatively small quantities ranging from a few grams to a few kilograms per hectare. They include iron, manganese, copper, zinc, boron, molybdenum, cobalt and chlorine.

Many soils are adequately supplied with all micronutrient elements in available form. Deficiencies are most commonly found in **peat and muck soils, sandy soils, calcareous soils, alkaline soils above pH 8 and acid soils below pH 5**. Very acid, alkaline or calcareous soils may have adequate or abundant micronutrients, but the micronutrients are unavailable due to the influence of soil chemistry on the forms of the micronutrients. In contrast, sandy soils, peats and mucks are often naturally poor in micronutrients. Any soil may become deficient in one or more trace elements after intensive cropping for many years. Temporary deficiencies may be induced by unusually heavy applications of liming materials or phosphate fertilizers.

The most common deficiencies found are boron, zinc and copper, and to a lesser extent, iron and manganese. Molybdenum and cobalt deficiencies are rare, and generally affect only the vigor of nitrogen – fixing bacteria in legume crops. Chlorine deficiency is virtually unknown.

### TEST FOR MICRONUTRIENT DEFICIENCIES

Micronutrient fertilizers should not be used unless a deficiency has been verified by soil or plant tissue testing. Growers unfamiliar with the micronutrient status of their soils should consult their local soils or field crop specialist. If deficiencies are known to exist, or are discovered through soil or tissue testing, it is advisable to apply no more than recommended rates. There is often a small difference between an adequate amount and a toxic amount of specific fertilizer material. Sensitive crops in rotation may suffer the following year if too much fertilizer is applied. There are also distinct interactions among all macro and micronutrients, some beneficial and some detrimental. This further emphasizes the need for a balanced nutrient regime based on soil or tissue testing.

#### 1. Metal Salts

Once the need for micronutrient fertilizers is established, growers should be aware of the wide range of costs and efficiency of various fertilizer materials. The most economical sources of micronutrients are metal sulfate salts and borates commonly blended into bulk fertilizer mixtures. These materials may also be used in foliar sprays or applied in irrigation water. In the form of metal salts, micronutrients tend to be lost through leaching or to be transformed into unavailable forms before the next growing season. Therefore, these must be applied at rates which permit sufficient uptake by the crop, while allowing for normal losses.

## 2. Metal Chelates

Metal chelates tend to persist in soils in available forms much longer than the simple salts. Therefore application rates may be lower. These, too, are suitable for foliar and irrigation application. However, they are relatively expensive. Blended micronutrient fertilizer products containing a variety of elements in chelate form are available, with the cost per unit of element slightly greater than for pure chelates.

## 3. Organic Sources

Fertilizers made from fish by-products, seaweed and sewage sludge also carry micronutrients, although in very small concentrations. Fish and seaweed fertilizers typically have small concentrations of micronutrients but they may be expensive. For biosolids (treated sewage sludge) used as a soil amendment, the Organic Matter Recycling Regulation specifies limits for particular micronutrients.

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### FOR FURTHER INFORMATION CONTACT

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