

# Soil FACTSHEET



BRITISH  
COLUMBIA

Ministry of Agriculture and Food

Order No. 631.000-1

Agdex: 532

Revised May 1991

## 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.**

Deficiencies in very acid, alkaline or calcareous soils are due to the unavailability of micronutrients, and not to any lack of these elements in the soil.

Sandy soils, peats and mucks are often naturally deficient. 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. By far the most economical sources of micronutrients are metal sulfate salts and borates commonly blended into bulk fertilizer mixtures. In this form, the approximate costs per kilogram of nutrient elements are \$1.50 for iron, \$1.90 for zinc, \$2.20 for copper, \$2.80 for manganese and \$3.75 for boron. 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. Sewage sludge products should not be applied at heavy rates as a source of micronutrients because they may contain high levels of toxic metals. Fish and seaweed fertilizers are harmless, but the cost per unit of micronutrient element from these sources is extremely high.

---

1<sup>st</sup> Edition  
November 1980  
Prepared by:  
C. Wood, Soils Specialist, Cloverdale

Revised, May 1991  
R. Kline  
Soil Conservation/Management Specialist  
BC Ministry of Agriculture, Fisheries & Food  
Prince George

---

### FOR FURTHER INFORMATION, CONTACT:

Geoff Hughes-Games, Provincial Soil Specialist  
Phone: (604) 556-3102  
Email: Geoff.HughesGames@gems7.gov.bc.ca

### RESOURCE MANAGEMENT BRANCH

Ministry of Agriculture and Food  
1767 Angus Campbell Rd.  
Abbotsford, BC CANADA V3G 2M3