

Soil Fertility

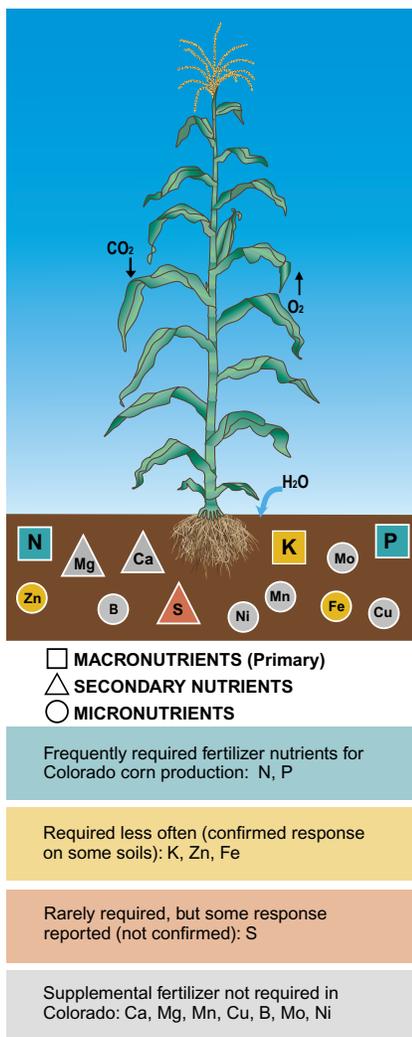


Figure 14. Essential elements for plants are required in varying quantities. For example, a bushel of corn removes approximately 0.8 lbs nitrogen, but only 0.001 lbs of zinc - an 800 fold difference.

Graphic modified from the International Fertilizer Industry Association.

- | | |
|---------------------|----------------------|
| N Nitrogen | Mg Magnesium |
| P Phosphorus | Mo Molybdenum |
| S Sulfur | Mn Manganese |
| K Potassium | Cu Copper |
| Zn Zinc | B Boron |
| Fe Iron | Ni Nickel |
| Ca Calcium | |

Corn plants require at least 16 nutrients in sufficient quantities for proper nutrition (Figure 14.) Using the sun's light and heat as an energy source, the corn plant is a living factory that uses nutrients to build simple sugars into more complex molecules for all its functions.

Corn plants obtain carbon, oxygen, and hydrogen from the atmosphere and from water and air in the soil. Other nutrients are absorbed by plant roots from the soil. Fortunately, only two to five of these nutrients are needed in supplemental quantities through fertilization or manure in Colorado. The remainders are supplied from the weathering of soil minerals, organic matter mineralization, irrigation water and rainfall.

The key to profitable fertility management in corn production is determining what additional nutrients are required to maximize efficient grain or silage production. As Figure 15 shows, the most profitable fertilizer rate is not always the one that gives maximum yield. The most reliable way to determine this rate is through soil sampling, and laboratory analysis (soil testing).

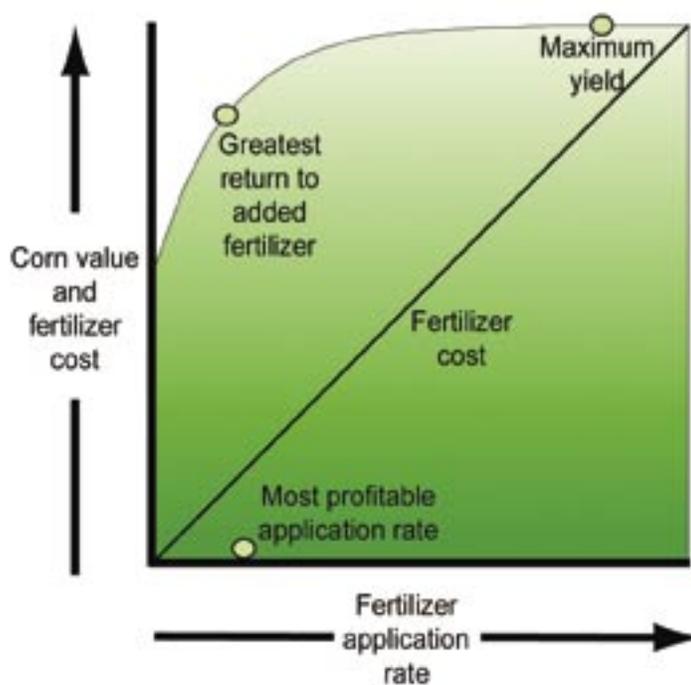


Figure 15. For most added fertilizer nutrients, corn yield increases rapidly at first and then levels off. The most economical yield is often not the maximum achievable yield and will depend upon the corn and fertilizer price.