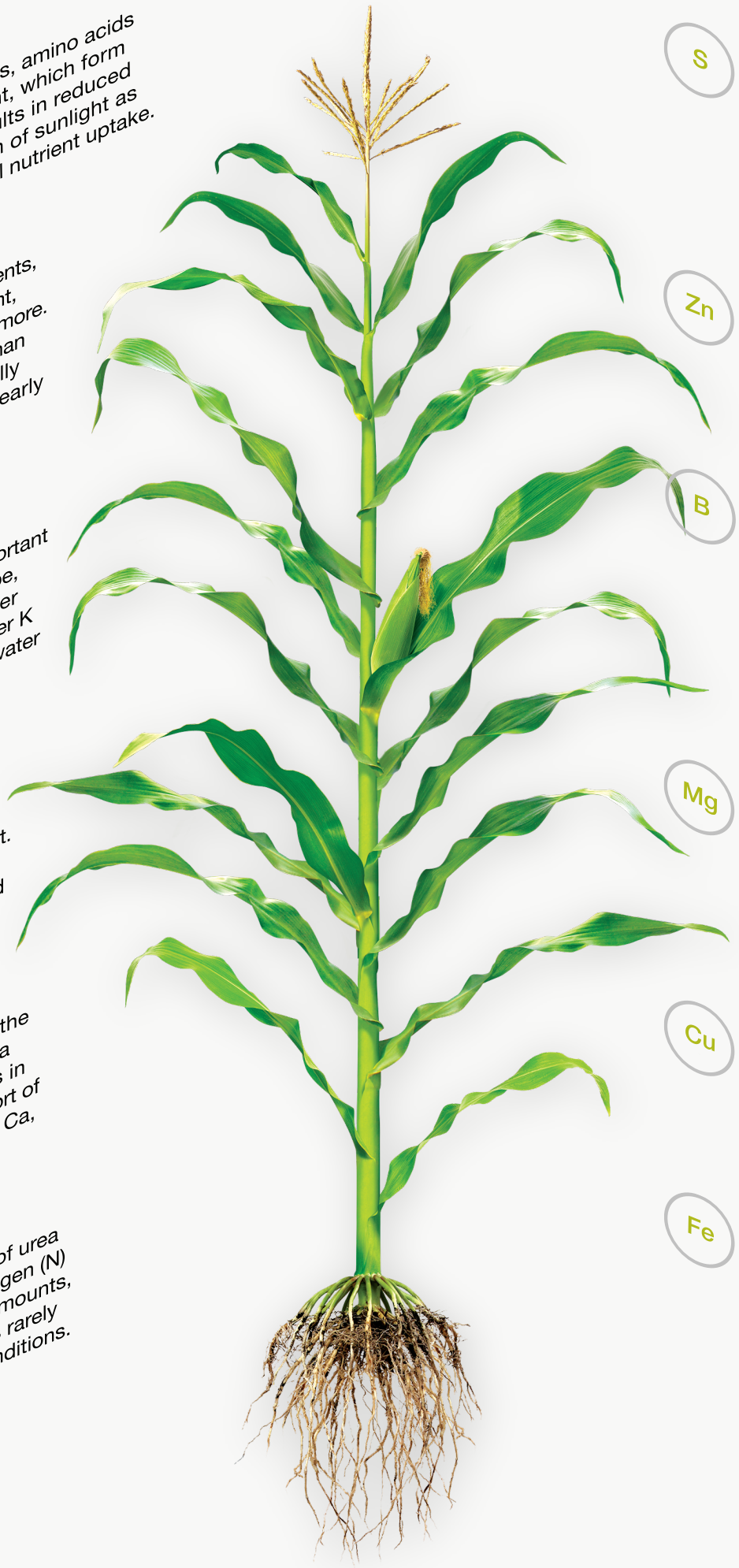
NUTRIENT KNOWLEDGE

THE 17 ESSENTIAL NUTRIENTS



N NITROGEN

Nitrogen is a component of vitamins, amino acids and energy systems within the plant, which form various proteins. N deficiency results in reduced chlorophyll, a decreased utilization of sunlight as an energy source, and limits overall nutrient uptake.

P PHOSPHORUS

One of the three primary macronutrients, phosphorus fosters root development, stalk strength, seed production and more. P deficiencies are harder to detect than N or K deficiencies and are generally associated with stunted growth in early stages of development.

K POTASSIUM

Potassium is known as the "quality nutrient" because of its important effects on factors such as size, shape, color, taste, shelf life, fiber and other quality-related measurements. Proper K levels maintain turgor and manage water loss and wilting.

Ca CALCIUM

Calcium is vital to the strength of the plant structures, all while helping balance organic acids within the plant. Ca contributes to yields indirectly by improving root growth conditions and stimulating microbial activity.

Cl CHLORINE

Chlorine is taken up by the plant as the Chloride anion. It regulates stomata activity to help minimize water loss in dry periods. It also supports transport of other nutrients, and cations such as Ca, Mg and K within the plant.

Ni NICKEL

Nickel is necessary for conversion of urea to ammonia. Ni is essential for nitrogen (N) metabolism and required in small amounts, with a critical level of 0.1 ppm. Ni is rarely found deficient in crop-growing conditions.

S SULFUR

Sulfur serves a wide variety of functions such as seed production, winter hardiness, protein synthesis and more. Adequate S is key for efficient nitrogen fixation in leguminous plants. S is increasingly deficient in the soil as it is a mobile nutrient.

Zn ZINC

Zinc aids in the synthesis of plant-growth substances and enzyme systems. Although Zn is needed in small amounts, high yields are impossible without it.

B BORON

Boron is the second most widespread micronutrient deficiency. Required in small amounts, primarily during reproduction stages, boron is a component in all cell walls within the plant. Due to phloem immobility, B is most effective when applied through a broadcast application for uptake through the roots.

Mg MAGNESIUM

Magnesium plays a critical role in plant health. Mg acts as a phosphorus carrier within plants and is required for better root formation. Proper Mg levels result in better nutrient and water use efficiency within the plant.

Cu COPPER

Copper assists in vitamin A production, protein synthesis and enzyme activation. Cu is key in nitrogen and hormone metabolism. It is immobile in the plant.

Fe IRON

Iron is essential for creating chlorophyll, assisting in cell division and necessary for plant growth. Deficiency prompts pale green/yellow leaves and lack of crop quality. Foliar sources work best.

Mn MANGANESE

Manganese acts as an enzyme activator and enables the manufacture of chlorophyll. This nutrient accelerates germination and maturity while increasing available P and Ca.

C CARBON

Carbon is responsible for all life on earth. Taken from atmospheric CO_2, plants use carbon as a source of essential biological compounds, such as carbohydrates and proteins.

H HYDROGEN

Hydrogen is derived almost entirely from water and is one of the major building blocks of plant growth. H assists in all plant processes – photosynthesis, plant respiration, glucose production – and is known as a structural element.

O OXYGEN

Oxygen is responsible for cellular respiration in plants. CO_2 is broken down during photosynthesis and O is released as a byproduct by the plant.

Mo MOLYBDENUM

Molybdenum converts inorganic phosphorus to organic forms – making P more available. It is more available as pH increases. Insufficient levels of Mo can cause marginal yellowing, cupping of leaves and stunting of plants.

LEARN MORE AT CROPNUTRITION.COM

Mosaic®