

The Root Cause

RECOGNIZING CORN NUTRIENT DEFICIENCIES

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Recognizing Corn Nutrient Deficiencies

Understanding the root causes of nutrient deficiencies—whether from soil characteristics, compaction, root injury, insect feeding, or temperature—is key to determining the best management strategies for correcting these issues. Let's take a closer look at some of the most common nutrient deficiencies in corn, both macronutrients and micronutrients, and how to manage them.

MACRONUTRIENT DEFICIENCIES

Nitrogen (N) Deficiency

Phosphorus (P) Deficiency

Potassium (K) Deficiency

Nitrogen Deficiency



Symptoms:

Nitrogen deficiency often appears in older, lower leaves. Because nitrogen is mobile within the plant, it is translocated to newer growth, causing yellowing that starts at the leaf tips and progresses down the midrib. This yellowing eventually turns to necrosis and can spread up the stalk if not addressed.

When to Expect it:

Deficiencies are more common later in the season when nitrogen applied earlier starts to run out. They are also more prominent in sandy soils prone to leaching. Early in the growing season, nitrogen deficiencies are less likely but may still occur, especially if the soil is compacted or dry.



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Phosphorus Deficiency



Symptoms:

Phosphorus deficiency generally shows up in older, lower leaves. A common symptom is purpling at the leaf tips, which can spread across the entire leaf in severe cases. It's essential to differentiate between phosphorus deficiency and **Purple Corn Syndrome**—a condition that causes similar purple coloring but doesn't lead to yield losses.

When to Expect It:

Phosphorus deficiencies are often seen early in the season, particularly if root growth is restricted and plants are unable to access phosphorus in the soil. Factors like dry or wet cool soils, compaction, or root injuries can exacerbate phosphorus deficiency. cool soils, compaction, or root injuries can exacerbate phosphorus deficiency.

Purple Corn Syndrome



More on Purple Corn Syndrome

Purple corn syndrome is often a genetic trait leading to uniform purpling across the field, while phosphorus deficiency manifests as inconsistent purpling, typically on older leaves first.

Potassium Deficiency



Symptoms:

Potassium deficiency usually manifests in older, lower leaves where the margins begin to yellow and eventually turn necrotic. Plants with severe potassium deficiency are more likely to experience lodging due to weakened stalks. This can be especially problematic around the 6-leaf stage.

When to Expect It:

Potassium deficiencies are often seen in dry or excessively wet soils. It is also more common in no-till systems where potassium may not be as readily available to plants.

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MICRONUTRIENT DEFICIENCIES

Sulphur (S) Deficiency

Zinc (Zn) Deficiency

Magnesium (Mg) Deficiency

Sulfur (S) Deficiency



Symptoms:

Sulfur deficiency appears in the newer, upper leaves since sulfur is immobile in the plant and remains in older growth. Symptoms include interveinal chlorosis, where the leaf turns a lighter shade of green, especially in sandy soils.

When to Expect It:

This deficiency is most common in younger plants and is more likely to occur in acidic, sandy soils combined with dry spring weather. In the past, the prevalence of sulfur deficiencies was lower, but this has changed as acid rain has decreased, which previously helped break down sulfur in the

Zinc (Zn) Deficiency



Symptoms:

Zinc deficiency typically affects newer leaves, where white bands appear that extend from the tip to the base of the leaf. This is often accompanied by interveinal chlorosis. In severe cases, the new leaves may become nearly white.

When to Expect It:

Zinc deficiency is most likely to occur in basic, cool, wet soils. While plants will often grow out of a mild deficiency, severe cases can lead to stunted growth.

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Magnesium (Mg) Deficiency



Symptoms:

Magnesium deficiency appears in older, lower leaves as interveinal chlorosis, accompanied by necrotic spots. As the deficiency worsens, the leaf tips begin to turn necrotic.

When to Expect It:

Magnesium deficiency is more common in acidic, sandy soils, especially where heavy rainfall has occurred. Additionally, excessive potassium levels in the soil can contribute to magnesium deficiency.

To confirm a nutrient deficiency, soil or tissue testing can be highly valuable. These tests can help you pinpoint the exact deficiency and identify the best corrective measures. However, it's essential to remember that as soils warm up and moisture levels increase, some deficiencies may resolve on their own as root growth and microbial activity pick up. Therefore, during vegetative stages a "wait-and-see" approach can generally be taken, with tissue samples being gathered later prior to silking if the symptoms are still persisting. Understanding the problem will help to create a management plan and strategy for the future when correcting the problem may not be feasible the current crop year.



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