Typically, purple corn leaves are automatically diagnosed as a phosphorus deficiency early in the spring. Although purple corn leaves are a symptom of phosphorus deficiency, this does not always mean there is a soil phosphorus deficiency per se. It could be that the plants are unable to access soil phosphorus due to problems with the root system, excess soil moisture, or cool temperatures.

Phosphorus deficiency in corn causes purpling of the leaves, beginning with the oldest leaves first (bottom to top). However, purple corn can still surface even in the absence of phosphorus deficiency.

During the process of photosynthesis, sugars are produced and stored within the plant tissues. These sugars are then metabolized in the plant to create energy for growth and reproduction. When plant growth slows down, like during a stretch of cool weather or when root growth is restricted by compaction, an accumulation of photosynthate in plant tissues, specifically anthocyanins, can give the leaves a purple color. When there are big swings in temperatures with bright sunny days and cold nights, the plants are more prone to turn purple.

Large differences in accumulation of sugars and anthocyanins exist between hybrids, and this is often why you may see only one hybrid turning purple in a field with multiple products on it.

FACTORS TO CONSIDER:

1. Restricted root growth
2. Soil compaction and sidewall compaction of the seed trench
3. Cool soils and environmentally cool conditions
4. Phosphorus levels in the soil
5. Genetics

ACTION PLAN:

Look for patterns in the field to determine if the purple coloring is due to phosphorus deficiency, compaction zones, areas of restricted root growth, or just genetic expression. If purpling is restricted to a specific area of the field and is not related to low or compacted areas, look further into soil conditions.

- Put the plant into context: Has the weather been cool but sunny?
- Examine the soil fertility to rule out phosphorus deficiency.
- Dig up plants to examine the root system: Is the root growth restricted by compaction or insect feeding?
SIDEWALL COMPACTION:

Sidewall compaction inhibits root development, nutrient uptake, and slows overall plant growth, which can result in purpling. It is crucial to ensure good seedbed preparation and planter settings to help limit the chance of sidewall compaction. Choosing the proper closing wheel for soil conditions can reduce sidewall compaction at planting.

Typically, there is not a shortage of phosphorus in the soil, but instead an issue with phosphorus availability. The leaves will turn back to green once the environmental conditions change and the plant returns to a normal growth cycle and the sugars redistribute.

Purpling generally occurs early in the vegetative stages, and the corn crop will appear normal by the V6 stage. Early-season purpling will rarely cause a reduction in yield as many studies have shown that the purpling is only on the outer cell layers of the leaves. Therefore, the photosynthesis process is not in jeopardy.

PURPLING IN CORN DUE TO SIDEWALL COMPACTION

SUMMARY:

Purple corn is a phenomenon that usually occurs when the plant is under stress from cool conditions and it can occur even with an adequate supply of soil phosphate. It’s important to understand that most purpling of young corn seedlings does not affect yield. Make sure soil conditions are fit when performing field operations. Soil compaction can exacerbate or be the underlying cause for purple corn. If the purple pigment fails to fade as temperatures increase, there may be another issue that requires your attention.