

Potassium Deficiency Symptoms in Some Crops

In modern commercial agriculture, symptoms of potassium (K) deficiency are not as commonly seen as in earlier years. However, visual symptoms and “hidden hunger” do still occur in some circumstances. Of course, other conditions can cause poor

growth or yield limitation. It’s also important to consider possible interactions with other nutrients or treatments.

Following are photos and descriptions of K deficiency for several major crops.



Corn: Firing or scorching appears on outer edge of leaf, while midrib remains green. May be some yellow striping on lower leaves. (Sorghum and most grasses also react this way.) Poor root development, defective nodal tissues, unfilled, chaffy ears, and stalk lodging are other symptoms in corn.



Soybeans: Firing or scorching begins on outer edge of leaf. When leaf tissue dies, leaf edges become broken and ragged...delayed maturity and slow defoliation...shriveled and less uniform beans, many worthless.



Alfalfa: With classical symptoms (shown at top right), first signs of K deficiency are small white or yellowish dots around outer edges of leaves...then edges turn yellow and tissue dies and becomes brown and dry. However, for alfalfa grown on soils high in sodium (Na), the K deficiency symptom has a different appearance, as indicated in the photo at left above.

Cotton: Cotton “rust”...first a yellowish or bronze mottling in the leaf. Leaf turns yellowish green, brown specks at tip around margin and between veins. As breakdown progresses, whole leaf becomes reddish brown, dies, sheds prematurely. Short plants with fewer, smaller bolls of short, weak fibers. In the past, K deficiency symptoms have been described as occurring on older, mature leaves at the bottom of the plant. In recent years, symptoms have been observed at the top on young leaves of some heavily fruited cotton varieties.



Wheat: Frequently, outstanding hunger signs on leaf itself (no discoloration, scorching, or mottling), but sharp difference in plant size and number, length, and condition of roots. Lodging tendency. Smaller kernels. In advanced stages, withering or burn of leaf tips and margins, beginning with older leaves.



Potatoes: Upper leaves usually smaller, crinkled and darker green than normal with small necrotic patches...middle to lower leaves show marginal scorch and yellowing. Early indicator: dark green, crinkled leaves, though varieties differ in normal leaf color and texture.



Apples: Yellowish green leaves curl upward along entire leaf...scorched areas develop along edges that become ragged. Undersized and poorly colored fruit may drop prematurely. Poor storage, shipping and canning qualities in fruit.



Rice: Rice deficient in K may show symptoms as stunted plants, a slight reduction in tillering, and short, droopy, dark green upper leaves. Yellowing may appear in interveinal areas of lower leaves, starting from the top and eventually drying to a light brown. Long, thin panicles and black, deteriorated roots may be related to K deficiency.



Sugarbeets: The first sign of K deficiency appears as tanning and leathery edges of recently matured leaves. When the soil solution is very low in K, a severe interveinal leaf scorch and crinkling proceeds to the midrib. Under high K conditions, tanning and leaf scorch lead to a smooth leaf surface.



Canola: Potassium deficiency reduces growth, resulting in smaller leaves and thinner stems. Plants are more easily lodged and may wilt. Under severe deficiency, the edges of older leaves become yellow, or scorched and may die completely, but remain attached to the stem.



Peanuts: Because K is easily redistributed from mature to younger organs, deficiency symptoms are first observable in the older, lower leaves. Deficiency is expressed by chlorosis of the leaves, beginning at the leaf margin. Potassium deficiency occurs frequently in acidic soils, and symptoms usually appear within five weeks of planting.

Coastal Bermudagrass:

Potassium plays an important role in heat, drought and cold tolerance of forage grasses. Leafspot diseases may be the first symptom of K deficiency recognized in Coastal and other hybrid bermudagrasses. Yellowing of older leaves, followed by leaf tip and leaf margin chlorosis, can occur with severe deficiency. Reddish-brown to purple spots, caused by fungal infection, may also be scattered over younger leaf blades. Thinning stands and reduced growth, followed by death of older leaves, are frequent symptoms.



Grapes: Potassium deficiency symptoms typically appear in early summer on leaves on the middle portion on the shoots. The leaves fade, becoming chlorotic beginning at the leaf margin, while the center portion of the leaf and veins remain green. The leaves tend to cup downward. In white wine varieties (such as Chardonnay, shown in photo) the leaves become mostly yellow or yellow bronze.