



Agri-Facts[®]

More K for your cotton

Cotton is more sensitive to low soil K than most other major crops due to high K demand when cotton is setting bolls. With heavy boll set that often occurs with modern, high-yielding varieties and reasonable weather conditions, potassium deficiencies can occur on soils not considered low in K. Potassium reduces the incidence and severity of wilt diseases, increases water use efficiency, and affects fiber properties such as micronaire, length and strength. Cotton takes up about 60 pounds of K₂O per acre per bale. Although K is taken up throughout the season, over 70% of the total uptake occurs after first bloom when it uses 2-3 pounds per acre per day. Bolls are the primary storage mechanism for potassium. Part of the reason for high concentration of K in the boll is that K is required to maintain sufficient water pressure for fiber elongation. Beside its role in maintaining water pressure, it is involved in enzyme activation and pH balance in the cell.

Potassium is not very mobile in soils with significant clay and silt content, so roots must grow near the source of K to have high uptake rates. Potassium is stored temporarily in the leaves, like nitrogen, and remobilized later into the developing bolls. Heavy boll demand for K often exceeds the soil and leaves capacity to supply adequate K. As a result, K deficiency symptoms of leaf bronzing and droppage occur from the top of the plant downward. Inadequate K leads to bolls not maturing and poor fiber quality. Early K deficiency (usually a result of inadequate soil supply) will appear on the lower leaves and can be corrected before serious yield loss occurs. Several researchers have concluded that the modern high-yielding, fast-fruiting varieties place a greater demand on the soil's ability to supply K than older varieties. Due to modern varieties and high yielding practices, we are seeing K deficiencies in more fields than before. Fields with low CEC values may benefit from split applications of K with 50-80% applied preplant and 20-50% topdressed in-season.

K needs to be available in the soil solution where the late season roots will be active. This presents a difficulty for some fields because surface application of K may not be available if the soil surface is dry and the roots are inactive. Under normal growing conditions, broadcast applications achieve similar results as banded applications. In-season foliar applications of K have been successfully used in some areas to partially satisfy K needs, but soil applications should be the standard practice.

Dry fertilizer application of N, and sometimes K, is becoming much more common once the yield potential of the crop is more predictable, i.e. after stand establishment. Broadcast application equipment is being used prior to boll set to add additional stabilized urea and dry potash. This type of application should be considered if preplant K applications were not made due to weather or cost considerations this year. The plants should not be wet when topdressing to minimize fertilizer burn from pellets sticking to the leaves. When N is mixed with K, uptake is enhanced due to the root growth stimulation of nitrogen. Magnesium and potassium can often interfere with root uptake of each other if they are not in balance. K-Mag fertilizer provides K and Mg in appropriate balance to prevent this problem and makes an excellent source of potassium for the newer, higher yielding cotton. It has a low salt index and chlorine content to reduce the potential for fertilizer burn.

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