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WHAT POTASSIUM SOURCE SHOULD I USE?

Western U.S. soils are becoming depleted of potassium. Soils in the West were commonly high in potassium when they were first cultivated long ago. However, after many years of intensive cropping and repeated nutrient removal, many fields now require regular inputs of potassium to maintain high levels of production. High yielding crops remove large amounts of potassium in the harvested portion of the crop.

It's little wonder that potassium deficiencies are becoming a common occurrence in so many fields. For example, harvesting 9 tons alfalfa will remove over 450 pounds of K_2O . Similarly, a potato yield of 450 cwt removes 500 pounds of K_2O , and harvesting 40 tons of tomatoes will take off over 450 pounds of K_2O . But these high rates of nutrient removal are not being matched with fertilization. In Idaho, for example, an average of 4 pounds of potassium are removed in crops for every pound that is added back. In the Pacific Coast states, over 2 pounds of potassium are removed on average for every pound returned to the field as fertilizer.

There are many excellent sources of potassium to replenish the soil's nutrient reserve. They include:

- Potassium chloride (muriate of potash) (KCl ; 0-0-60)
- Potassium sulfate (sulfate of potash) (K_2SO_4 ; 0-0-50-18S)
- Potassium-magnesium sulfate (K-Mag) ($K_2SO_4 \cdot 2MgSO_4$; 0-0-22-22S-11Mg)
- Potassium thiosulfate ($K_2S_2O_3$; 0-0-25-17S)
- Potassium nitrate (KNO_3 ; 13-0-44)

How are these sources different?

The potassium in all these fertilizers is identical and the nutrient will be rapidly available to the plant regardless of the source. The primary difference is in the companion nutrients that come along with the potassium.

Chloride The importance of this essential nutrient is frequently overlooked. Recent research has demonstrated that many crops respond favorably to chloride applications with greater yield and quality. Like any soluble fertilizer, salt-induced damage can result if large amounts are placed in close proximity to seeds or seedlings.

Sulfate All crops require an adequate supply of sulfur to develop proteins and enzymes. Sulfur-deficient plants appear light green and have reduced yields. The sulfate present in potassium fertilizers is immediately available for plant uptake, while thiosulfate rapidly converts to the sulfate form in the soil.

Magnesium Because of its vital role in chlorophyll, magnesium deficiency is first exhibited by yellow leaves in the lower part of the plant. Magnesium requirements vary considerably, with legumes generally containing more of this element than grasses.

Nitrate An abundant supply of nitrogen is essential for all high-yielding crops. For crops that prefer a nitrate source to an ammonium source of nitrogen, this potassium source can be a good option.

There are many excellent potassium sources available for meeting the nutrient requirements of crops. When making a decision on which source to use, choose the one that meets your needs and provides the accompanying anion that will help keep your high-yielding crops in top shape.

A PowerPoint presentation reviewing some of these principles is available at: <http://www.ppi-ppic.org/ppiweb/pusawest.nsf>

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Note: *Agri-Briefs* are available online at the PPI website: ppi-ppic.org/agri-briefs