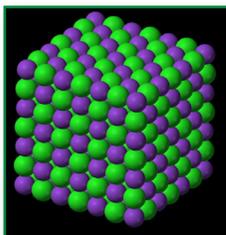


## Potassium Chloride

Potassium fertilizers are commonly used to overcome plant deficiencies. Where soils cannot supply the amount of K required by crops, it is necessary to supplement this essential plant nutrient. Potash is a general term used to describe a variety of K-containing fertilizers used in agriculture. Potassium chloride (KCl), the most commonly used source, is also frequently referred to as muriate of potash or MOP (muriate is the old name for any chloride-containing salt). Potassium is always present in minerals as a single-charged cation ( $K^+$ ).

### Production

Deeply buried potash deposits are found throughout the world. The dominant mineral is sylvite (KCl) mixed with halite (sodium chloride), which forms a mixed mineral called sylvinite. Most K minerals are harvested from ancient marine deposits deep beneath the Earth's surface. They are then transported to a processing facility where the ore is crushed and the K salts are separated from the sodium salts. The color of KCl can vary from red to white, depending on the source of the sylvinite ore. The reddish tint comes from trace amounts of iron oxide. There are no agronomic differences between the red and white forms of KCl.



Potassium chloride contains a one- to-one ratio of the two elements.

Some KCl is produced by injecting hot water deep into the ground to dissolve the soluble sylvite mineral and then pumping the brine back to the surface where the water is evaporated. Solar evaporation is used to recover valuable potash salts from brine water in the Dead Sea and the Great Salt Lake (Utah).

### Agricultural Use

Potassium chloride is the most widely used K fertilizer due to its relatively low cost and because it includes more K than most other sources...50 to 52% K (60 to 63%  $K_2O$ ) and 45 to 47% Cl.

Over 90% of global potash production is used for plant nutrition. Potassium chloride is often spread onto the soil surface prior to tillage and planting. It may also be applied in a concentrated band near the seed. Since dissolving fertilizer will increase the soluble salt concentration, banded KCl is placed to the side of the seed to avoid damaging the germinating plant.

Potassium chloride rapidly dissolves in soil water. The  $K^+$  will be retained on the negatively charged cation exchange sites of clay and organic matter. The  $Cl^-$  portion will readily move with the water. An especially pure grade of KCl can be dissolved for fluid fertilizers or applied through irrigation systems.

### Management Practices

Potassium chloride is primarily used as a source of K nutrition. However, there are regions where plants respond favorably to application of Cl. Potassium chloride is usually the preferred material to meet this need. There are no significant impacts on water or air associated with normal application rates of KCl. Elevated salt concentrations surrounding the dissolving fertilizer may be the most important factor to consider.

### Non-agricultural Use

Potassium is essential for human and animal health. It must be regularly ingested because the body does not store it. Potassium chloride can be used as a salt substitute for individuals on a restricted salt (sodium chloride) diet. It is used as a deicing agent and has a fertilizing value after the ice melts. It is also used in water softeners to replace calcium in water. ■

Abbreviations and notes: K = potassium; Cl = chloride.

### Chemical Properties

Property:	KCl
Fertilizer analysis	0-0-60
K content	approx 50%
Water solubility (20 °C)	344 g/L
Solution pH	approx. 7



Potassium chloride is found in various shades and particle sizes.

