

K-Mag AGRI FACTS

Brought To You By IMC — Producers of Quality Crop Nutrients

Balanced Fertility Crucial For Profitable Soybean Production

- **Proper K levels important for drought resistance, pod formation and seed quality**
- **Magnesium essential for plant photosynthesis**
- **Plants need sulfur for the formation of root nodules**

High, profitable soybean yields are being achieved by many farmers throughout the world. All these farmers have one thing in common — they have put together a complete package of production inputs tailored to meet their specific needs. A well-balanced fertility program is an extremely important component of the overall production plan for high yields of soybeans. And K-Mag can play a very important role in balancing fertility.

K-Mag is a naturally-occurring mineral (langbeinite) which contains three nutrients essential for plant growth — potassium (22% K₂O), magnesium (11% Mg) and sulfur (22% S).

Potassium

Potassium performs many beneficial roles in plant growth. Adequate K nutrition has a considerable beneficial effect on the water balance of plants. Transpiration loss of water from leaves is reduced as K concentrations increase. Likewise, plants are better able to withstand periods of drought.

Research has shown that additions of potassium on K-deficient soils increased the number of pods as well as exerted a beneficial influence on retaining pods until harvest. Also, it has been demonstrated that adequate potassium markedly improved seed quality by reducing the number of shriveled, shrunken, moldy and off-color beans.

In soybean research in North Carolina, the addition of 54 lb/A on low-testing soils resulted in four-fold yield increases as an average of all varieties. Besides potassium, soybeans require good fertility management with both magnesium and sulfur. Table 1 illustrates that as yields increase, so do the amounts of K, Mg and S removed from the soil.

Table 1. Soybean Nutrient Utilization.

Yield (bu/A)	Nutrients Utilized (lb/A)		
	K ₂ O	Mg	S
20	68	8	7
40	135	16	14
60	205	24	20

Magnesium

This is an often overlooked — but very important — nutrient in soybean fertility programs. Magnesium is part of chlorophyll, the green coloring matter of plants. Magnesium is thus essential for the process of photosynthesis, the process by which plants produce carbohydrates from carbon dioxide and water.

Balanced fertility is also important in soybean production, especially with the relationship of potassium to magnesium. For example, it has been shown in many crops that increased K fertilization will reduce the plant content of Mg and potentially reduce the plant's ability to produce chlorophyll. Therefore, it is important that the magnesium levels in soybeans be maintained at adequate levels. Magnesium also helps carry phosphorus throughout plant tissues.

Sulfur

Sulfur is a very important nutrient for optimum production of high-yielding soybeans. Sulfur is a component of several amino acids, the "building blocks" of proteins. This nutrient is therefore very important with respect to quality.

Sulfur is essential for the formation of nodules on the roots of legumes. Soybeans that are low or deficient

in S are poorly nodulated and therefore nitrogen fixation is depressed. This likewise has an adverse effect on crop quality (reduced protein levels).

Sulfur is also involved in the formation of oil in soybeans. This effect is not widely recognized, but it has been found that additions of magnesium to sulfur further enhances the production of oil. The influence of sulfur and magnesium in combination with potassium on oil content of soybeans is illustrated in Table 2.

Table 2. Influence Of Sulfur And Magnesium On Oil Content Of Soybeans.

Treatment	Oil Content (%)
N + P	22.9
N + P + K + Cl	24.0
N + P + K + SO ₄	24.8
N + P + K + SO ₄ + Mg	25.4

Fertilizer Application for Soybeans

Although only relatively small amounts of fertilizer nutrients are required in the very early stages of plant growth, high concentrations of nutrients in the root zone at that time can help promote early plant growth. Even though the amount of nutrients taken up is relatively small, the final size of the soybean plant depends to a large degree upon having adequate supply of nutrients available to the plant early in the growing season.

This is where K-Mag can help, even on highly fertile soils. For example, K-Mag is a highly water-soluble source of readily-available nutrients; potassium, magnesium and sulfur. Besides, K-Mag is a non-acidifying source of nutrients . . . it will have no effect on soil pH. With these unique qualities, K-Mag can help provide a much needed boost to young soybean plants.

At later stages of growth, soybeans require much larger amounts of nutrients. Here again, K-Mag can contribute to a well-balanced fertility program.

K-Mag can be used in combination with other fertilizers or can be applied directly. The nutrient needs of the plant, as well as the soil, should help determine the rate of application. However, typical application rates are 100-200 lb/A of K-Mag.

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