

# K-Mag AGRI FACTS

Brought To You By IMC — Producers of Quality Crop Nutrients

## K-Mag And Balanced Fertility — For High-Yielding, High-Quality Tomatoes

A highly profitable tomato crop doesn't just "happen." It takes a great deal of planning and a complete package of Best Management Practices (BMP's). A balanced fertility program is a very important BMP for profitable tomato production. And K-Mag can play a very important role in such a fertility program. K-Mag is a naturally-occurring mineral (langbeinite) that contains three nutrients essential for the growth of all plants: potassium (22% K<sub>2</sub>O), magnesium (11% Mg) and sulfur (22% S). These nutrients all play very important roles in the production of high-yielding, high-quality tomatoes.

### Potassium

This nutrient plays an important role in transporting sugars produced in the leaf by photosynthesis to the developing tomato fruit. Adequate K nutrition has also been shown to reduce the severity of several physiological disorders such as uneven ripening, hollow fruit, irregularly shaped fruit, gray wall, and blotchy ripening. Table 1 shows the effect of K<sub>2</sub>O applications on the severity of gray wall.

**Table 1. Effects Of N And K On Tomato Quality.**

N Applied lb/A	K <sub>2</sub> O Applied lb/A	N: K <sub>2</sub> O Ratio	% Of Fruit With Gray Wall
100	100	1 : 1	29
100	200	1 : 2	19
100	400	1 : 4	11
400	50	8 : 1	49
400	100	4 : 1	41
400	800	1 : 2	14

### Magnesium

This nutrient is a component of chlorophyll, the green coloring matter of plants. Chlorophyll is essential for the process of photosynthesis — the process by which plants combine carbon dioxide and water to form sugars. So if a tomato plant is deficient in Mg, its rate of photosynthesis decreases, and it is not producing optimum amounts of sugars for



translocation to the developing fruit. Yields and quality can be markedly reduced. Table 2 shows the response of tomatoes to Mg applications on a Mg-deficient loamy sand adjusted to two pH levels.

**Table 2. Tomatoes Respond To Mg.**

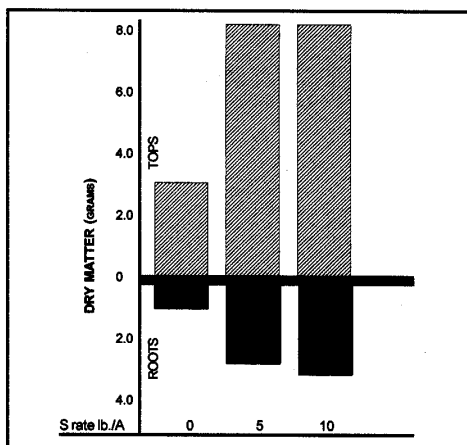
Soil pH	Mg Rate (lb/A)	% Mg in Leaf	Yield Tons
4.9	0	0.33	14.4
	50	0.45	16.8
	100	0.54	17.4
	150	0.66	18.5
5.5	0	0.31	16.5
	50	0.41	20.3
	100	0.51	22.9
	150	0.60	21.9

The greatest degree of response was to the first application rate (50 lb. Mg/A). This is not surprising. Typical Mg application rates are 25-40 lb/A. It's interesting to note that responses to Mg occurred in this experiment at leaf levels above 0.3% Mg. This is not a particularly low leaf Mg content, and tells us that tomatoes have a relatively high demand for this nutrient.

Figure 1 shows how K and Mg teamed up to reduce the occurrence of unevenly ripened tomatoes. The

greatest response was to K, but Mg further reduced unevenly ripened fruit at all three potash levels.

**Figure 1. K And Mg Improve Tomato Quality.**



**Sulfur**

Under S-deficient conditions, not only is yield reduced — the quality of tomatoes is likewise reduced. Sulfur is a component of the amino acids cysteine and methionine, and amino acids are the “building blocks” of proteins. Many studies have shown that adequate S nutrition increases the protein content of plants. In addition, the levels of these two amino acids has a marked effect on protein *quality*. Under S deficiency, the levels of cysteine and methionine are reduced, which reduces the “essential amino acid” (EAA) index of protein — and this in turn reduces the nutritive value of tomatoes. S deficiency can cause an increase in non-protein nitrogen levels in plants. In particular, nitrate-nitrogen content can reach dangerously high levels in S deficient plants. This is especially likely to happen when high rates of fertilizer nitrogen are applied to low-S soils. And since high amounts of fertilizer N are often applied to tomatoes, this effect of S on nitrate levels assumes great importance.

K-Mag application rates depend on soil analyses, but typical rates are 150-300 lb/A. K-Mag is used to supply the Mg and S requirements of tomatoes. Usually, additional potash will be required over and above the amount contained in K-Mag, and this should be supplied as muriate of potash (MOP, 60% K<sub>2</sub>O). For instance, if soil analysis results call for 25 lb. Mg and 200 lb. K<sub>2</sub>O, these amounts can be supplied as follows:

230 lb. K-Mag	=	50 lb. K <sub>2</sub> O	+	25 lb. Mg
250 lb. MOP	=	150 lb. K <sub>2</sub> O		
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Total	=	200 lb. K <sub>2</sub> O	+	25 lb. Mg

In summary, the use of K-Mag in a well-balanced tomato fertility program will provide the following benefits:

- A water-soluble, plant-available source of Mg and S.
- A water-soluble source of potash in the premium sulfate form.
- A non-acidifying fertilizer — K-Mag has no effect on soil pH.
- Helps produce tomatoes of superior quality.
- Helps maintain a proper balance of K and Mg — and also of N and S — in soils and plants.