

K-Mag AGRI FACTS

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K-Mag For High-Yielding, Quality Tobacco

Tobacco was the first crop in the United States to be diagnosed as Mg deficient under field conditions. The early tobacco-magnesium research was begun in the 1920's in North Carolina. Intensive greenhouse and field studies over a period of about twenty years provided a wealth of information regarding the effects of Mg deficiencies of tobacco, and the roles of Mg in the nutrition of all plants. The work performed at that time was so comprehensive and thorough that little has been done in the U.S. since. It would therefore be interesting to revisit these studies and restate the reasons Mg is such an important nutrient in tobacco fertilization programs.

It was shown that Mg deficiency resulted in an approximate 25% reduction in yield, but even more importantly, a 35% reduction in the value of the crop. It was reported that Mg deficiency resulted in harvested . . . “leaves that are dull, lusterless, light brown in color, abnormally thin, nonelastic and of papery texture.”

These studies found that leaf Mg content seldom exceeded 0.6 percent when grown on light soils, but could be as much as two or three times this amount on heavier soils or when readily available magnesium was supplied to light soils. However, magnesium deficiencies in tobacco may not become observable until the deficiency becomes acute. The following table illustrates this point (Table 1).

Table 1. Mg Content Of Tobacco Leaves And Degree Of Visible Deficiency Symptoms. North Carolina

% Mg In Leaf	Observable Symptoms
0.08 - 0.10	Severe Deficiency Symptoms
0.15	Well-Defined Symptoms
0.22 - 0.27	No Visible Symptoms

While dolomitic limestone is often used to correct soil pH and supply magnesium, these early studies showed the application of adequate Mg in the sulfate form corrected all evidence of deficiency while

applications of ten times as much dolomitic limestone often did not.

Leading tobacco growers throughout the world are increasingly using K-Mag — sulfate of potash magnesia — in their fertility programs to assure top yields of high-quality tobacco. K-Mag is a naturally-occurring mineral that supplies three nutrients essential for the growth of all plants — 22% potash (K₂O), 11% magnesium (Mg), and 22% sulfur (S). There are many reasons why this material is such an excellent fertilizer for tobacco:

- K-Mag is highly water soluble and, thus, **immediately available** for absorption by plants. This is very important when considering fertilizers for tobacco. The tobacco plant grows very rapidly and produces a tremendous volume of leaves. Insoluble or slowly-soluble materials, such as dolomitic limestone, can't release nutrients at a sufficient rate to keep up with the heavy demands of this crop.
- K-Mag is a low-chloride material. All the K and Mg present in K-Mag is in the premium sulfate form. Chloride content is typically less than 1.5%.
- K-Mag has excellent physical characteristics. There are three product size ranges. Crystalline and compacted granular grades are both excellent for inclusion in bulk blends; the crystalline type being slightly higher in total nutrient content, with the compacted having better blending characteristics and consistency of particle size. The smaller sized standard material is ideal for direct application.
- K-Mag helps maintain a proper balance between K and Mg in soils and plants. As potash fertilization rates increase, it becomes increasingly difficult for plants to absorb Mg. And since tobacco has a high requirement for K, it is very important to make sure that sufficient Mg is available in order to prevent K-induced Mg deficiencies.

Results from other tobacco-producing areas of the world continue to reinforce the original research and show the benefits of magnesium fertilizers in general, and K-Mag in particular.

Results of an extensive study of Mg fertilization of tobacco in Nigeria clearly showed the importance of this nutrient for maximum production on various soils (Table 2).

Table 2. Effect Of Mg On Growth Characteristics And Yield Of Tobacco. Nigeria*

Treatment lb Mg/A	Plant Height (cm)	Leaf Area (cm /plant)	Leaf Yield (lb/A)
0	85	16,830	2,043
21	94	21,162	2,672
42	96	21,118	2,747
64	93	19,793	2,616

* Average of three trials

Note that there was a marked response to the initial level of Mg (21 lb/A), but that increasing rates resulted in no further yield response. This is typical of results from many areas — application rates of 20 - 30 lb. Mg/A are optimum.

Recent results from Canada clearly demonstrate the superiority of soluble K-Mag over insoluble magnesium oxide (MgO) as a Mg source for tobacco (Table 3).

Table 3. Effect Of Form Of Mg On Yield And Value Of Tobacco. Canada

Treatment	% Mg in Leaf	Yield (lb/A)	Gross Return \$/A
0 Mg	0.14	1,875	2,788
MgO	0.16	1,954	2,922
K-Mag	0.26	2,051	3,057

A great deal of work has been carried out recently in China regarding K-Mag fertilization of tobacco. Results of an exhaustive 5-year study carried out on soils low in both K and Mg are shown in Table 4.

Table 4. Effect Of Sulfate Of Potash (SOP) And K-Mag On Yield And Quality Of Tobacco*

Treatment	Yield (lb/A)	Relative Value of Crop
N-P	1,071	100
N-P-SOP	1,700	327
N-P-K-Mag	1,875	386

* Average results over 5 years and 3 locations

Results from around the world are clear; magnesium is an extremely important nutrient for high yields of quality tobacco, and K-Mag is an excellent fertilizer source of this nutrient.

K-Mag is used in tobacco fertility programs to supply all of the needed Mg. The potash needs are usually considerably higher than the Mg requirements, so K-Mag must be supplemented with sulfate of potash (SOP) to satisfy the K₂O requirements. Thus, if recommendations call for the application of 30 lb. Mg and 120 lb. K₂O, these could be supplied as follows:

270 lb. K-Mag	=	30 lb. Mg	+	60 lb. K ₂ O
120 lb. SOP	=		+	60 lb. K ₂ O
Total	=	30 lb. Mg	+	120 lb. K ₂ O