



For Immediate Release

For more information, please contact:

Randy Groff
The Mosaic Company
763-577-2765
randy.groff@mosaicco.com

STUDY SHOWS INCREASED APPLE QUALITY WITH K-MAG

Research scientists conclude that K-Mag is one K source that won't decrease critical Mg levels

Recent research demonstrated that Pacific Northwest growers who rely on fertigation to deliver nutrients to high-density apple orchards may be able to increase fruit quality by supplementing with a broadcast K-Mag fertilization program.

"The Pacific Northwest's semi-arid conditions and coarse-textured soils create a unique soil fertility challenge for the region's apple producers," says Dr. Gerry Neilsen, a research scientist with Pacific Agri-Food Research Center, Summerland, B.C. Neilsen, along with Dr. Denise Neilsen, conducted the three-year study on 15 typical high-density apple orchards on sandy soils.

"We found in previous studies that popular NP fertigation practices can actually induce K deficiencies, but the K deficiencies were more serious on the sandier sites," he says. (Roots under drip irrigation tend to only proliferate in smaller volumes of soil, therefore limiting the plant's ability to acquire immobile nutrients, like K, Neilsen explains). "Applying a K-only source can correct the K problem, but what we've found is that both soil and leaf Mg levels go down."

Magnesium is essential for chlorophyll production, phosphorus (P) absorption and stimulation of plant growth. Deficiency symptoms in apples are characterized by interveinal chlorosis (and some necrotic brown tissue) on basal leaves of new year's growth, and under extreme conditions, premature leaf drop and defoliation.

It was concluded that broadcast applications of 112 to 225 lbs/A of K as K-Mag:

- Increased leaf tissue K concentration
- Increased soil K levels
- Maintained leaf Mg concentration

Additionally, when leaf K levels had been inadequate, broadcast K-Mag applications:

- Increased fruit acidity (sharper flavor)
- Increased apple fruit size
- Increased red coloration
- Decreased incidence of water core.

A premium fertilizer source, K-Mag is a naturally occurring source of three essential nutrients – potassium (21.5-22%), magnesium (10.5-11%) and sulfur (21-22%). Available in the highly available water-soluble sulfate form, K-Mag is low in chloride and will not affect soil pH. It is 100% natural, and the K-Mag NATURAL grade is listed by the Organic Materials Review Institute (OMRI) for use in organic crop production.

"High-yielding apple trees require huge amounts of K, but high K rates can restrict plant absorption of Mg," he explains. "In our trials, it became a priority to identify fertilization practices that would help overcome this antagonistic relationship between K and Mg. Ultimately, we found that K-Mag applications increased K levels and maintained Mg levels, whereas K-only sources resulted in declining Mg levels."

Macintosh, New Town and Spartans are very susceptible to Mg deficiencies, he adds.

New Leaf K Target: 1.3%

Neilsen says the British Columbia trials showed leaf K levels should be at or above 1.3%. “We used to say 1%, but we now know that apple trees really perform at 1.3% or higher,” he says. “Go below that and you’re asking for problems.”

With a heavy crop load, apples will draw K from the leaves, resulting in leaf scorch, he says. When this happens, the very process that drives fruit growth – photosynthesis – is impaired.

“The advantage of K-Mag is it supplies both K and Mg in the appropriate balance,” he continues. “If growers have sandy soils that are susceptible to K and Mg problems, and their apples are under drip irrigation, they should strongly consider broadcasting K-Mag as a maintenance tool to keep up appropriate levels of K and Mg.”

He adds that annual soil and leaf sampling, as well as physical observation of the plants, are critical. “Especially with high-density orchards, you have to think long term about soil fertility. You have to keep the tree’s framework healthy because it’s the framework for the next year.”



The Mosaic Company, 3033 Campus Drive Suite E-490, Plymouth, Mn. 55441, Phone 763-577-2700

© 2009 The Mosaic Company. All Rights Reserved. K-Mag is a registered trademark of The Mosaic Company