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K and Calcium Boost Melon Quality

Studies show foliar applications of potassium and calcium can improve melon quality and shelf life.

Working with the largest cantaloupe and honeydew melon growers in Texas and with other collaborators, we have used a balanced nutrition approach to address the issue of improving and preserving fruit quality. Calcium (Ca) and potassium (K) are key minerals involved not only in processes determining fruit quality and storability, but also in human nutrition and health. Not only does Ca contribute to building strong bones in humans, it also helps melons develop stronger rind tissue. Due to many environmental factors, plants cannot absorb enough of these minerals from the soil during fruit formation to ensure optimum fruit quality standards. We have, therefore, looked at the possibility of using foliar sprays as a supplement to soil-derived nutrients to improve and preserve fruit quality.

Calcium studies

We collaborated with Albion Nutrition Labs in studies of foliar Ca applications for honeydews and cantaloupes on the vine as a supplement to or alternative for post-harvest Ca treatments to preserve quality. Albion is an exporter of dietary supplements and manufacturer of glycine-linked Ca (glycine is a protein-building amino acid from soybeans).

The shelf life of ripe melons is usually less than 12 days, but it nearly doubled when the fruit was treated with Ca in our field tests. Ca applications enable growers to provide more nutritious vineripened melons in greater quantities to distant markets—specifically, honeydew melons to Japan.

K studies

While doing the Ca research we discovered that cantaloupe and orange-

fleshed honeydew melon grown in high-K soils had slightly greater beta-carotene levels. Even though most soils test high for K, only a small portion of it is available to plants for a variety of reasons including competition for uptake from other essential minerals. We found a cost-effective solution to that problem in applying K through foliar sprays during fruit growth, when the root's ability to take up K is poorest.

In greenhouse and field studies using popular commercial melon varieties, applying K specifically during fruit development increased fruit sugar concentrations and vitamin C levels, possibly through beneficial effects on plant photosynthesis. These foliar K treatments also greatly increased fruit levels of beta-carotene, a powerful dietary antioxidant that regulates singlet oxygen, one of the most damaging reactive oxygen types in humans. The K formulation is relatively simple, inexpensive, safe, and readily available.

Two K formulas were used: 1) K linked with glycine and 2) KCl (a table salt substitute). We applied these food-grade compounds over 4- to 6-week periods in the spring and fall, during which time they were absorbed through plant leaves and the developing melon's skin. These elemental formulas can be mixed with pesticides or other chemicals for more efficient application. The glycine-K mix worked generally better than the KCl, but both were superior to relying only on soil derived K.

So far, after gathering data from collaborators from two harvests, K and other nutrient levels in the fruit have increased significantly without any complications. The K-treated fruit matured 2 to 3 days earlier—something growers like.

Research expanded

Unquestionably, K and Ca research can be combined to further improve the overall quality of melons. The results of our Ca studies are being applied by other researchers and growers to crops such as watermelon, chilies, tomatoes, papayas, bananas, and squash grown elsewhere in the world.

Grower and industry representatives involved with these crops are committed to promoting this innovative concept and strongly believe in the potential economic rewards.

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