Proper Zinc Nutrition Enhances Coffee Grain Quality

Coffee contains compounds shown to improve health and alertness; among them are caffeine and chlorogenic acids. Caffeine may have positive implications for individuals with diseases like hypercholesterolemia and cancers while chlorogenic acids, melanoidins, and other substances are strong antioxidants, showing hypoglycemic, antiviral, liver protective, and immunoprotective effects. Niacin, produced from trigonelline during roasting, is an important vitamin. The synthesis of all these compounds, as well as sugars and volatile compounds, depends on the mineral nutrient availability.

There are few studies on the influence of nutrients in the formation of compounds related to the quality of coffee beans and coffee beverage. The effects of zinc (Zn) on coffee beverage quality is addressed only in two papers. In an article recently published in Crop Science, researchers evaluated the influence of Zn on chemical composition, beverage quality, and production of coffee beans. To do this, they grew coffee plants with increasing doses of Zn and analyzed the resulting coffee beans.

The researchers discovered proper zinc nutrition enhances the contents of sucrose, caffeine, and trigonelline of coffee grains. They also report the foliar contents of Zn in the range of 8.0 to 12.75 mg Zn kg⁻¹ are adequate to maximize these compounds in coffee grains. This kind of study helps to do a fine adjustment in fertilization doses to achieve productivity and quality.


Identifying Sclerotinia Blight Resistance in U.S. Peanut Mini-core Collection

Use of disease-resistant plants is the most economical and sustainable approach for managing diseases. Plant germplasm collections are valuable sources of desirable traits such as disease resistance, but many accessions have yet to be characterized.

In the May–June 2018 issue of Crop Science, researchers evaluated accessions of the U.S. peanut mini-core germplasm collection for three years in the field for resistance to Sclerotinia blight, a destructive soilborne disease. In addition, the accessions were rated for yield, seed quality characteristics, and for a genetic marker associated with Sclerotinia resistance.

From the two years most favorable for disease, the team identified 21 accessions with less than 10%, and 7 accessions with less than 5% disease incidence. Resistant accessions were also more likely to possess the genetic marker for Sclerotinia blight resistance. One resistant accession, PI 478819, was similar to commercial cultivars in yield (3,617 kg ha⁻¹ over three years) and also had the highest seed quality among entries, large kernels, and a large proportion of extra-large kernels. In laboratory tests, PI 478819, was similar to the resistant cultivar Georgia 03L when inoculated with Sclerotinia minor, the pathogen causing Sclerotinia blight.

The 21 germplasm accessions identified may be useful to peanut breeders seeking additional sources of resistance to Sclerotinia blight. Researchers developing cultivars for the larger-seeded Virginia peanut market type may find PI 478819 especially useful.


doi:10.2134/csa2018.63.0708

doi:10.2134/csa2018.63.0709