EFFECT OF FOLIARLY-APPLIED ACIDS AND FERROUS SULFATE ON IRON NUTRITION OF AVOCADO TREES

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Iron deficiency is a major problem of avocado grown in calcareous soils. Applying chelated iron to calcareous soil is efficacious but very expensive. The effects of foliarly applied organic acids and organic acids plus ferrous sulphate (FS) on iron nutrition of 10-year-old 'Donnie' avocado trees in calcareous soil was investigated in southern Florida. At 13-14 day intervals, trees received the following foliar treatments: ascorbic acid (A), A plus FS (AFS), citric acid plus FS (CFS), and sulphuric acid plus FS (SFS). Additional treatments were chelated iron (EDDHA-Fe) applied to the soil 3 times at 27-28 day intervals and a control receiving no iron (CNT). An organosilicone adjuvant was added to all foliar sprays. On 4 of 7 measurement dates, trees in the EDDHA-Fe treatment had higher leaf chlorophyll indexes determined with a SPAD meter (SPAD values) than trees in all other treatments. On 2 measurement dates, trees in the SFS and AFS treatments had higher SPAD values than trees in the CNT and A treatments. Total leaf iron content was higher for the SFS and CFS treatments than the AFS, EDDHA-Fe, CNT, and A treatments. There was no difference in total leaf iron content between the CFS and AFS treatments. Leaf ferrous iron (Fe^{2+}) content was higher for the SFS, CFS, AFS treatments than the EDDHA-Fe, A, and CNT treatments after 6 foliar acid applications and 3 EDDHA-Fe applications to the soil. Economic analysis indicated that foliar acid-iron treatments were 75 to 88% less costly than soil applications of EDDHA-Fe.