

The Potential Use of a Silicon Source as a Component of an Ecological Management of Coffee Plants

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SUMMARY

Coffee is one of the most important agricultural export commodities in the world and it represents the main export resource for some developing countries. Therefore, the development of new methods of coffee management that improves production without causing any damage to the environment is an attractive alternative for the producers. Much effort has been invested towards the understanding the mode of action of compounds that can induce resistance against several pathogens without injuring the environment. Inasmuch, many researches have considered silicon efficient in order to avoid plant pathogen penetration and development. The purpose of this study was to verify the effect of potassium silicate and calcium/magnesium silicate on the development of coffee seedlings (*Coffea arabica*), cultivar “Mundo Novo” as well as to evaluate the incidence of coffee leaf rust development under greenhouse conditions. The experiment was a completely randomized design with 12 treatments with ten plants per treatment. The treatments were 0, 0.25, 1.25, 2.5, 4 and 5 μM of Si for each source of silicon incorporated into soil. The seedlings were inoculated with a urediniospores suspension of *Hemileia vastatrix* (2mg.mL^{-1}) at the 7th month after planting (six pair of leaves). Evaluations were performed by counting the number of lesions per leaf. The statistical analysis showed that the number of lesions reduced up to 66% in the highest silicon dose when compared to the number of lesions in control plants. Infected plants were found to have a linear decrease of lesions with the increase of silicate concentration. The lowest number of lesions per leaf area was observed in plants that received 5 μM of Si from potassium silicate. This result indicates the use of silicon as an alternative for an ecological management system for coffee disease protection.