Software development to determine the nutritional status of sugar cane crops based on DRIS method

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ABSTRACT

In tropical soils, the introduction of commercial crops in the organic farming system depends on the usage of efficient software for managing soil acidity and fertilization with appropriate products for organic agriculture.

The usage of the leaf analysis, interpreted through the critical levels has been an option. The method DRIS (Diagnose and Recommendation Integrated System), developed by Beaufils, is a method that uses the ratio between the concentrations of the nutrients for the interpretation of the results on foliar and soil analysis thus overcoming the limitations of the traditional methods of diagnose. The development of software becomes necessary because the calculations of the DRIS indexes are extremely complex and there is no software developed for sugar cane crops that are cultivated in agroecology systems in Brazil. The usage of software can allow the information to reach farmers and technicians who work in the agricultural sector, providing ways to diagnosis the nutritional balance of crops, to use fertilizers in the right season and time, and consequently, to decrease the costs, to improve the productivity and even to decrease the pollution, from a perspective of a more sustainable agriculture. Due to the relevance of the sugar cane crop system, which has important contributions to the economic, cultural, environmental, and social sectors, the usage of this software is justified. In this study an organization of the data and rules of the DRIS for the organic sugar cane crop production was done for the State of Goias, Brazil. These data and rules were used "to feed" the software. The developed program uses language Borland Delphi. To get the nutrient input data, specific rules was used for each sugar cane specie and region which were based on the concentrations and relationships between nutrients and on comparisons between them and the related rules. The software allows the accomplishment of a complete and simple diagnosis because when typing the values of the sugar cane leaf concentrations got from a foliar analysis in their right spaces, the software generates the graph with its respective indexes for each nutrient which allows the indication of those nutrients that are limiting the productivity.

Keywords: Saccharum officinarum L., Agroecology, Plant Nutrition