Modeling sugar cane potential yield through climate parameters

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Conceptual mathematical model is presented and discussed toward simplification in order to be usable in determining cane (biomass) production potential for first generation of biofuels, also intended to serve as a tool for benchmarketing in evaluating different practices in different conditions through comparing of the parameters that will be determined for each condition that will represent the efficiency of the crop.

The model is based mainly on radiation interception and water use efficiency, using as a base parameter previous yields obtained in each condition. The model can be refined as much as data are available, that means that it can be applied for each kind of soil, whether, time of planting or harvesting (ratoon), variety, irrigation, general management, etc.

Knowledge gaps will also be able to be determined through the application of the model, even when validation will not be possible to be done since it can be used for determining the potential, and to validate obtained data is needed to be compared.

Principles and concepts of different levels of yields due to determining, limiting and reducing factors of production with the ecophysiology of the cane may be discussed and generate new patterns for future field researches.

The application of the model on more than 5 thousand commercial fields in Piracicaba region validated the model and showed the basics parameters to begin to be used as proposed model for determining production potential. Finally, a simple SWOT analysis is made to help the discussion on possible upgrades.

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