Application of Geographic Information System to estimate production of para-rubber by using crop simulation models

Chamaporn Paiboonvorachat Kannika Homyamyen and Chulalak Suttirod

Abstract

The purpose of this study is to compare the yield of para-rubber from the Plantgro model based on potential of the soil to the yield of para-rubber from the actual fields, and to apply geographic information system (GIS) to create spatial database of the yield. First, the data that relates to para-rubber production and its yield are collected by field. After collecting the data, soil, climate and crop files are used in running the model with Plantgro software. The results from the model are, then, assessed the accuracy by calculating the Agreement Index and compared to the field data. If a value is greater than 0.75, it means that the value from the model is acceptable (Albers and Wards, 1991). Next, we use the estimated yields to create the thematic digital map of para-rubber yield. The result shows that the predictied yields of 80 percent of all samples (90 survey points) are acceptable, which is considered high agreement. However, there are 20 percent of all samples that have the Agreement Index less than 0.75 (between 0.34 and 0.72), which are not acceptable. The estimated yields differ from the actual yield because of the better land management, the higher productivity of para-rubber varieties, the different methods in havesting. The final map shows that the study area has the potential to produce 61,409 tons of para-rubber.

Keywords: para-rubber, Plantgro software