

Land suitability mapping for implementation of precision farming

Abstract

This paper studies the potential of satellite imagery in mapping of soil compaction and land suitability using Remote Sensing and GIS method. GIS and remote sensing, play an important role in environmental study, monitoring and remediation which can be used for a great variety of application. Soil compaction is important part in crop growth and the major causes for reduced crop yield worldwide. The aim of this study is producing the potential of land suitability map through measuring soil compactness for implementation of precision farming. In addition, it analyzes the correlation between soil compaction data and pixel value of satellite imagery. For this study, soil penetrometer tool are used to record data manually while digital analysis uses satellite images. A Landsat 5 TM and SPOT 5 images of Perlis were acquired to illustrate the use of Remote Sensing to identify areas of possible soil compaction. Soil sampling data was collected and simultaneously recorded the coordinate using GPS handheld. The correlation was analyzed in identifying areas of potential soil compaction using linear regression and polynomial. The farmers can used the product of soil suitability map to identify areas suitable for particular crops. Furthermore, to increase crop production through the use of integrated remote sensing, GIS, GPS and sensor technologies simultaneously maintaining the quality of the environment.

Keywords; GIS; GPS; Precision farming; Remote sensing; Soil compaction