



The accuracy of soil map for variable rate phosphorus fertilisation

M.R. Maleki (1,2) and J. De Baerdemaeker (1)

(1) Katholieke Universiteit Leuven, Division of Mechatronics, Department of Biosystems, Leuven, Belgium
(mohammadreza.maleki@biw.kuleuven.be), (2) Department of Agricultural Machinery, College of Agriculture, Shahid Bahonar University of Kerman, P.O. Box 76169-133, Kerman, Iran

The basic concept of precision agriculture is to match the input and field requirement. The Variable rate (VR) fertilisation technique allows the ability to vary the rate of fertiliser application based on the field information, normally using field maps. In VR phosphorus fertilisation, field map is developed using grid soil sampling and soil P analysis. The objective of this study is to investigate how many samples are basically required to develop an accurate map. Fresh samples collected from 0.1 - 0.2 m depth of arable fields and grassland from three different fields and were subject to chemical analyses for soil P using two methods, Olsen P and extractable ammonium lactate P.

The coordinates of each sample was located by a DGPS (Trimble® AgDGPS 132, USA) and converted into Lambert 72 coordinates to have the distance in the metric system. The result of each P analysis was put against its coordinates. Out of all sample records in each field (100 % of the data) 75, 50, 25 and 10% of the sample records were randomly selected and was used to develop field P map. The Surfer 8.00 (Golden Software) software was used to draw the maps using the Kriging method. Comparison of soil P maps showed a considerable difference while the number of samples used for map development is decreasing. However, there is a degree of similarity between maps using more soil samples. This means for developing an accurate map for precision agriculture it is not necessary to collect a massive sample sets.