

Project title: Determination of Application Zones by Soil Productivity Variation at Field Levels, Menemen Case

Research Area	Soil Water Resources and Environment
Research Program	P08
Executive Institute	International Agricultural Research and Training Center
Supporting Institute/s	GDAR (General Directorate of Agricultural Research and Policy), Ege University
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Project Summary:

Determination of variability in soil productivity within a field and monitoring between years and detecting the underlying reasons are significant for a sustainable soil use. Within this framework, in order to determine field level soil productivity and to determine a method that facilitates regional fertilization management, 36 soil samples were collected at the corners of 50 m x 50 m grids on a 12,5 ha field in Menemen for the parameters of soil structure, nitrogen, phosphorus, potassium, organic matter, pH, EC, calcium, sodium, zinc and magnesium. Following soil analysis, the parameters were studied by isotropic spheric, exponential and Gaussian models. By ordinary kriging, distribution map of clay content obtained was mimicked by high and medium level auto correlations of total nitrogen and available phosphorus.

At the same time, the parameters of vegetation, height, biomass and LAI were studied on Göktürk-2 satellite images by unsupervised and supervised classifications. Plant parameters distributed according to soil structure especially when the field was under wheat.

By this project, potentials of geostatistical methods on field data and analysis of remote sensing were evaluated. According to the results obtained, a sub region was outlined near east and west borders. When the field was under wheat, both geostatistical methods and remote sensing methods were successful. But when it was under maize, geostatistical methods were more dependable. Consequently, soil productivity was determined more effectively by geostatistical and image analysis when the field is under rainfed conditions. However, when it was under irrigated conditions geostatistical methods were more successful.

Key words: Soil productivity, GIS, remote sensing, yield maps