

A MULTICOVERAGE DATABASE FOR A DATE PALM REGION USING GLOBAL POSITION AND GEOGRAPHICAL INFORMATION SYSTEMS

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The spatial distribution of date palm and environmental variables in a region far apart from classical probability calculus could be taken into account by semivariogram and kriging analysis. In this paper we used GPS together with GIS to develop a multicoverage database for a date palm culture region, the base map (1: 10 000 scale) of which was of unknown coordinate system. A Trimble GPS unit was used to obtain the coordinates of selected ground control points and one-way-road positions within the date palm oasis. An ARC/INFO GIS was used to transform the base map digitized in units of the base map into metric UTM system by the affine transformation of the coordinates of the ground control points. The accuracy of this procedure was analyzed by comparing the GPS one-way-road positions with their corresponding GIS transformed positions. A 45-m buffer was required for at least 95 percent of the GIS roads to occupy the same GPS road positions. Multilayer maps were developed using semivariogram analysis and the kriging estimation of the spatial distribution of date palm yield and phosphorus and potassium soil tests. Error analysis indicated that the resulted maps must be at a lower scale than the base map with a scale of 1: 45 000 as an upper limit.