



Comparing the applicability of some geostatistical methods to predict the spatial distribution of topsoil Calcium Carbonate in part of farmland of Zanjan Province

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Most of soils in Iran, were located in the arid and semi-arid regions and have high pH (more than 7) and high amount of calcium carbonate and this problem cause to their calcification. In calcareous soils, plant growing and production is difficult. Most part of this problem, in relation to high pH and high concentration of calcium ion that cause to fixation and unavailability of elements which were dependent to pH, especially Phosphorous and some micro nutrients such as Fe, Zn, Mn and Cu. Prediction of soil calcium carbonate in non-sampled areas and mapping the calcium carbonate variability in order to sustainable management of soil fertility is very important. So, this research was done with the aim of evaluation and analyzing spatial variability of topsoil calcium carbonate as an aspect of soil fertility and plant nutrition, comparing geostatistical methods such as kriging and co-kriging and mapping topsoil calcium carbonate. For geostatistical analyzing, sampling was done with stratified random method and soil samples from 0 to 15 cm depth were collected with auger within 23 locations. In co-kriging method, salinity data was used as auxiliary variable. For comparing and evaluation of geostatistical methods, cross validation were used by statistical parameters of RMSE. The results showed that co-kriging method has the highest correlation coefficient and less RMSE and has the higher accuracy than kriging method to prediction of calcium carbonate content in non-sampled areas.