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The Effect of Water Content on the Penetration Resistance of Different Soils,
and Regression Models

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Abstract: The purposes of this study were to determine the relationships between soil water content and soil penetration resistance, and to develop regression models for comparing penetration resistance in different soils. A field study was conducted on four different soils in Entisol on the Konya plain. Significant relationships were found between soil water content and soil penetration resistance ($r^2= 0.77$ to 0.99). The results of regression analysis showed that the regression equation was $Y=a+bX^3$, in which Y was penetration resistance (kPa) and X was soil water content (%), a and b were constants changing with soil and different layers of the same soil. Correlation coefficients between penetration resistance calculated from regression equations and penetration resistance from field experiment measurements varied between 0.94 and 0.99.

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