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A study was taken up to model runoff volume and peak discharge from two small agriculture watersheds through multiple regression analysis using rainfall amount, its duration, maximum rainfall intensity and antecedent precipitation index from 1981-1987. The regression equations were found to be statistically valid explaining 60 to 82% of the variation. Maximum variation was explained by rainfall amount in the models for estimation of runoff volumes, whereas it was rainfall intensity which explained the maximum variation in case of peak discharge models. Verification of the regression models was done by comparing the estimated values generated by the models developed and the observed values (1985-87) not used in development of the models. The 't' test verified the use of regression models to hold good for estimating the runoff values.