

## ABSTRACT

An erosion study to evaluate water runoff, soil loss, nitrogen losses, crop growth and yields was carried out over two growing seasons in the Northern Range, Trinidad. Soil loss, rainfall erosivity and soil erodibility were the major parts of another study and are not reported here. Water runoff and inorganic nitrogen losses in the runoff water and eroded sediments were evaluated in four experiments conducted on 7<sup>0</sup>, 14<sup>0</sup> and 30<sup>0</sup> slopes of bare-soil plots and plots cropped with corn (*Zea mays* L.) and cowpea (*Vigna unguiculata* (L.) Walp) with and without tillage. The soil type was Maracas sandy clay loam, an Orthoxic tropudult, at the Hillside Station in the Northern Range. A fifth experiment to monitor erosion losses was also carried out on 25<sup>0</sup> slope with bare-soil and corn plots on another Orthoxic tropudult, Matelot sandy clay loam at the La Pastora Station in the Northern Range. The following results were obtained: (i) Cropping reduced water runoff on all the slopes studied; (ii) Water runoff did not necessarily increase with slope; (iii) Water runoff was greater under no-tillage than from the tilled treatments on the 14<sup>0</sup> slope; (iv) During both studies during 1977 and 1978, there were no significant differences in water runoff between the corn and cowpea treatments on all the slopes with the exception of the 7<sup>0</sup> slope during the 1978 study; (v) In both studies there were no significant differences in water runoff from the bare-soil treatments on the 7<sup>0</sup> and 14<sup>0</sup> slopes and the 14<sup>0</sup> and 30<sup>0</sup> slopes. In the 1978 study water runoff from the 30<sup>0</sup> slope for the bare-soil treatment was significantly higher ( $p = 0.05$ ) than that from the 7<sup>0</sup> slope; (vi) From the nitrogen loss study, there

were no significant differences in inorganic nitrogen losses in both the runoff water and eroded sediments from all the treatments on the different slope categories; and (vii) The concentration of inorganic nitrogen in the runoff water was much lower than that in the eroded sediments, for example, the mean concentrations of inorganic nitrogen over the period of study for the corn treatment on the 30° slope were 4.575 ppm and 48.511 ppm for the runoff water and eroded sediments respectively.

During the second study in 1978, there were no significant differences in the dry matter production and nitrogen-uptake by the cropped treatments on the three slope categories studied. In the 1977 study there were no significant differences in dry weight yields of corn + cob and cowpea + pod between the 7° and 14° slopes under tillage and the 14° and 30° slopes without tillage. There were also no significant differences in yields from the tilled and untilled treatments on the 14° slope. However for the 1978 season, the yields of both the corn and cowpea on the 14° slope were significantly higher ( $p = 0.05$ ) than those from the 30° slope. There were also no significant differences in yields between the 7° and 14° slopes, and the 7° and 30° slopes.