

Effects of maize and potato intercropping on crop root system and soil aggregates in sloping field

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Abstract:

Soil and water loss in sloping field seriously affects the sustainable development of agriculture in Yunnan province. Four treatments (MM maize monoculture, PP potato monoculture, PM potato and maize intercropping, CK blank control) and three repetitions (slope degrees of 10, 20, 30 were studied) were set up in this study. The results showed that in different planting patterns, root characteristic value (root content, root number, root length) and soil depth were negatively correlated. At 0-10cm, root content, root number and root length of maize, PM treatment increased by 33.79%, 18.46% and 14.38% respectively compared with MM treatment. At 0-10cm, root content, root number and root length of potato, PM treatment increased by 5.32%, 17.66% and 23.99% respectively compared with PP treatment. The content of soil aggregates treated with PM above 5 mm was 35.71%, 41.52% and 71.32% respectively higher than that of PP, MM and CK treatment, respectively. Content of water stable aggregates treated by PM was 54.87%, higher than 8.42%, 10.41% and 21% by MM, PP and CK treatment respectively. In conclusion, maize and potato intercropping can enhance root system, promote the formation of soil aggregate and reduce soil erosion.

Keywords: sloping field, intercropping, root characteristics, soil aggregate