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Runoff; soil-nutrients loss through runoff and crop productivity as influenced by crop covers in vertisols of central India

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A field experiment was conducted at Indian Institute of Soil Science, Bhopal to evaluate the influence of crop covers on soil organic carbon, runoff, soil and nutrient losses through runoff and crop productivity in vertisols of Central India. Seven treatments consisted of three sole crop cover viz., soybean, maize and pigeon pea and three intercrop covers namely soybean + maize (1:1), soybean + pigeon pea (2:1) and maize + pigeon pea (1:1) along with one cultivated fallow (control). Results revealed that among the crop cover treatments, the runoff and soil loss was significantly higher under sole pigeon pea (177 mm and 2.15 t ha^{-1} followed by sole maize (167 mm and 1.99 t ha^{-1}), maize + pigeon pea (140 mm and 1.60), soybean + maize (135 and 1.48 t ha^{-1}), soybean + pigeon pea (132 mm and 1.34 t ha^{-1}) intercrops and lowest was under soybean sole crop (132 mm and 1.48 t ha^{-1}). The highest runoff and soil loss was recorded higher under cultivated fallow as compared to sole as well as intercrops. In relation to nutrient losses, the losses of soil organic carbon (SOC) and total nitrogen, phosphorus and potassium (NPK) were lower under sole soybean and its intercrops as compared to sole crops of maize and pigeon pea. However, the losses of SOC and total NPK were the highest under cultivated fallow over sole and inter crops. In term of system productivity, maize + pigeon pea (1:1) and soybean + maize (2:1) as a intercrop are the best options in reducing runoff, soil -nutrient losses and sustaining crop productivity of system in Vertisols of Central India.

Biography

R. K. Singh has completed his Ph.D. from G. B. Pant University of Agriculture and Technology, Pant Nagar, Uttarakhand. He is working as senior scientist in Indian Institute of Soil Science, Nabibagh, Berasia Road, Bhopal, Madhya Pradesh, India. He has published approximately 20 papers in national and international journals.

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