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Suitability classification for different crops using GIS - A village level approach

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Abstract

A land resource inventory was conducted at NBSS & LUP, Nagpur during 2010-11 to determine the suitability of crops for site-specific database suitable for farm level planning in Bansinghi and Parseoni villages of Parseoni mandal, Nagpur District, Maharashtra, India. Suitable areas for crops were determined using a multi-criteria evaluation approach based on the soil, crop requirements and characteristics of the land. Suitability of soils for major crops was determined by comparing different land qualities with crop requirements (Sys *et.al*., 1993). The whole area falls under AESR 10.2 and the mean annual rainfall ranges between 1000 – 1300 mm. Parseoni mandal with an area 16,493 ha comprises of 31 villages, out of which two villages covering an area of 1,345 ha was surveyed. Sixty seven profiles were studied and five tentative soil series were arrived. Thematic maps of soil phases, soil depth, slope, soil erosion, drainage, surface soil texture, electrical conductivity, pH, OC, BD, CEC, Ca, Na, AWC, OM etc were prepared. These layers were intercepted and the specific suitability criteria were entered in GIS and the suitability map for crops such as rice, wheat, Cotton, Sorghum , Chilli, Citrus, Sapota, and Sunflower were derived. The Bansinghi village was found to be highly suitable for Sorghum (78% area of the village), moderately suitable for Sunflower (94%) and Citrus (78%) and marginally suitable for Rice (87%), Wheat (94%), Cotton (94%), Chilli (94%), and Sapota (94%) whereas, Parseoni village was highly suitable for Sorghum (40%), moderately suitable for Citrus (44%) and Sunflower (67%) and marginally suitable for Rice(74 %), Wheat (74%), Cotton(74%), Sapota and Chilli (66%). It was found that most of the area was marginally suitable for most of the crops. P^H and organic carbon were the main soil properties affecting the suitability of different crops in the study area.

Keywords: soil, GIS, crop suitability