

Soil Quality Index of Different Land Forms and Cropping Systems of Agricultural College Farm, Naira, Andhra Pradesh

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ABSTRACT

Soil quality evaluation was carried on soils of twelve different cropping systems of Agricultural college, Naira farm, Andhra Pradesh. Twenty two soil quality indicators were assessed in the laboratory and soil quality indices of SQI and RSQI were computed. Relatively high values of soil quality of SQI and RSQI of 327 and 81.75 respectively were recorded with soils of Guava (CS10) and cashew (CS8) plantation followed by redgram-fallow cropping in rainfed uplands(CS4) with corresponding soil quality class of II (slight limitation for plant growth). Lowest SQI and RSQI values of 270 and 67.5, respectively were recorded with soils of mesta fallow system (CS5) in rainfed upland with corresponding soil quality class of IV (severe limitation for plant growth). Soils of rice- pulse (CS2) of irrigated upland and redgram – fallow (CS4), Mango (CS6) and Sapota (CS7) of rainfed uplands and rice- sunhemp (CS12) in low lands were qualified for soil quality class II . Soil of rice-maize system (CS3), rice- rice system (CS1) in irrigated uplands, coconut plantation (CS9) of rainfed uplands and rice- fallow system of lowlands (CS11) were qualified for class III of soil quality indices. The study suggested suitable management options for soil health and sustainable crop production in these soils. Correlation analysis revealed significant negative correlation between pH and available N ($r = -0.355^{**}$), available P_2O_5 ($r = -0.422^{**}$), available Fe ($r = -0.264^*$), and hydraulic conductivity ($r = -0.267^*$). The soil organic carbon showed significant positive correlation with available N ($r = 0.427^{**}$), P_2O_5 ($r = 0.578^{**}$), K_2O ($r = 0.211^*$), Zn ($r = 0.582^{**}$), Cu ($r = 0.218^{**}$), Fe ($r = 0.306^*$) and Mn ($r = 0.251^*$). CEC of soil showed a significant positive correlation with available nitrogen ($r = 0.274^*$), zinc($r = 0.256^*$) and copper($r = 0.283^*$) and enzymatic activity. Positive and significant correlation was observed between soil organic carbon and enzymatic activities viz., dehydroginase ($r = 0.509^{**}$), urease ($r = 0.428^{**}$) and phosphatases ($r = 0.356^*$). Positive and significant correlation was observed between soil organic carbon and enzymatic activities.

Keywords: *Agricultural college, Soil quality, Soil physical properties, Soil chemical properties and Soil biological properties*