

Qualitative land suitability evaluation for the growth of rice and off-seasons crops as rice based cropping system on paddy fields of central Guilan, Iran

ABSTRACT

Land suitability evaluation analysis is a necessary to achieve optimum management and utilization of the available land resources for sustainable agricultural crops production. One of the most serious and urgent constraint in lowland paddy fields of Iran is to improve agricultural land management and cropping patterns either to increase the agricultural production with proper land use resources or to get more income from out of season plant as a second crops. Therefore, the objective of this study was to find the most suitable off-season crops after rice. Qualitative Land Suitability (QLS) classification of fifteen first and second agricultural crops in the paddy fields of the Guilan plain in Iran under RBCS that covers an area of 40567 ha was carried out. By using the semi-detailed method of soil classification, 24 soil units at 11 soil series in five different physiographic units were identified (river alluvial plains (5 series), low lands (2 series), river banks (2 series) and coastal plains and sand dunes (2 series)). Land and climate characteristics of each crop with its requirements were also determined and rated based upon Parametric and simple limitation method proposed by Sys et al. [1]. The obtained indexes indicated that land suitability classes varied from S2 (moderately suitable) to N (Not suitable). The highest land suitability class for crops are: S2 for Rice, Spinach, Beans, Radish, Garlic, Shall cress, Clover, Lettuce, Rape seed, Bean (vulgaris and faba cultivars) and S3 for Wheat, Carrot, Barley, Triticale, and Rice (Ratoon). The most important limiting factors are: climate (low temperature and high rainfall at vegetative and reproductive growth stages), drainage (shallow water table depth), soil (texture) and fertility (low organic carbon content, pH) (alone or in combination) respectively, those influence adversely on the land suitability classes, especially climatic and drainage limitation, because of growing season in autumn and winter. Verification of the factors and their relative significance is very important for decision on land suitability.

Keyword: Land suitability; Paddy fields; Rice; Second crops