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## Performance of CropSyst simulation model for groundnut-wheat cropping system in IGNP Stage-II

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Simulation models are an important tool to understand soil-plant interactions on water balance components and their effects on crop growth and land productivity. Compared to field experiments, the use of crop models to evaluate crop responses to a wide range of management and environmental scenarios can give more timely answers to many management questions at a fraction of the cost of conducting extensive field trials. CropSyst is one of the most important process-oriented simulation models largely used for field crops all over the world to study the effect of climate, soil and management practices on crop productivity. In the present study, we have calibrated and validated the CropSyst model for groundnut-wheat cropping system of Bikaner region in IGNP Stage-II.

Field experiments were carried out during 2012-13 and 2013-14 on Typic Torripsamments at the farmers field in Bajju (Bikaner) located between 072°47'79"E longitude and 28°14'23"N latitude. The CropSyst model was calibrated for groundnut-wheat for different crop parameters, soil profile data and observed daily weather data of experimental site during 2012-13 and validated for aboveground biomass (AGB), grain yield, N uptake and moisture content by comparing simulation outputs with observed data during 2013-14.

The result of validation showed that the simulated seed yield (2926 kg ha<sup>-1</sup>) of groundnut agreed to the observed yield (3023 kg ha<sup>-1</sup>) with relative error of 3.3%. Simulations of aboveground biomass of groundnut showed good match with the observed data with

100 g<sup>-1</sup>, respectively. While other mineral like Fe, Na, K, P, Cu and Se were significantly at higher in sea buckthorn under barren and wetland systems as compared to river and slope land use systems.

It has also been recorded that *Hippophae* is useful in conserving soil, especially on fragile slopes, due to its extensive root system as it possesses nodules in its roots that fixes nitrogen and improves fertility. In areas having no presence of *Hippophae*, the top soils were eroded and no vegetation was present. Erosion may be checked by growing seabuckthorn which also improve fertility. Therefore seabuckthorn may be utilized for protecting soil health as it further supports other vegetation for reducing desertification. In addition to this, being an important plant species, the leaves, flowers, and fruits may be utilized for many other purposes like herbal medicine, processing beverages, spices etc.