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capacity was 14.17 mg/g dry.wt (\hat{V}_B : 160.97mL/g) in the test column. There is no change in the biomass sorption capacity after 5 times sorption and desorption experiments using CaCl_2 , NaCl , CH_3COOH and EDTA.

2006 / 226

Effects of Dry Farming Development on Surface Runoff Characteristics

Sh. Khalighi¹, M. Mahdavi², B. Saghafian³, Sh. Ebrahimi⁴

¹ Faculty of Natural Resources, University of Tehran, Iran

e-mails: khalighi@ut.ac.ir; sh_khaligh@yahoo.com

² Faculty of Natural Resources, University of Tehran, Iran

³ Soil Conservation and Watershed Management Research Center, Iran

⁴ Faculty of Natural Resources, Mazandaran University, Iran

Abstract

Dry farming development and land use changes that has recently occurred in many parts of Iran has brought changes in water regime in many different rivers. The same has happened in the study area in Barandoozchay catchment with an area of 1146 km² located in northwestern of Iran. In this region during 45 years (1955-2000 for which air photographs and satellite images are available) the dry farming areas increased from 4528 to 20231 ha. NRCS model along with HEC-HMS software were used to simulate rainfall-runoff relation in the catchment area. Results indicate that the flood increased up to 70% during the studied period, but the extent in increase in peak discharge became lower for the higher return periods. In additions in new condition the time of concentration (T_c) is decrease up to 14% and the lowest daily discharge has recession trend during the period.

2006 / 228

Weed Management in Drylands of Pakistan

Muhammad Saeed^{1*}, Khan Bahadar Marwat² and Ikramullah Khan Marwat¹

¹ Department of Weed Science, NWFP Agriculture University, Pakistan

*e-mail: stf_62@yahoo.com

² Faculty of Crop Protection Sciences, NWFP Agriculture University, Pakistan

Abstract

Dry areas have much more problem of weeds as compared to irrigated areas due to aggressive behavior of weeds. Thus competing well with crop and lowering the yield. According to a self-conducted survey in Kohat-Pakistan the major weeds were *Carthamus oxyacantha*, *Avena fatua*, *Cirsium arvense*, *Phalaris minor*, *Convolvulus arvensis*, *Medicago denticulata*, *Malcolmia* sp., *Silybum marianum*, *Setaria* sp., *Rumex crispus*, *Lolium* sp., *Fumaria indica*, *Polygonum* sp., *Vicia sativa* and *Lathyrus* sp. According to farmers surveyed the yield reduction due to these major weeds ranged from 20-50 % in wheat. Keeping in view the losses due to these weeds, an experiment was conducted on the effect of various herbicides for weed control in wheat at Barani Agriculture Research Station, Kohat during the rabi season 2005-2006, using Randomized Complete Block Design with four replications. The experiment comprised of eight treatments, viz; seven herbicides and a weedy check, each treatment consisting of 5 rows each 25 cm apart and 5 m long making treatment size of 5m x 1.5m. The herbicides were; clodinafop @ 0.05 kg, 2,4-D @ 0.7 kg, bromoxynil + MCPA @ 0.49 kg, isoproturon @ 1.0 kg, carfentrazone-ethyl @ 0.02 kg, terbutryn + triasulfuron @ 0.16 kg, fenoxaprop-P-ethyl @ 0.93 kg a.i ha⁻¹ and a weedy check. The data recorded on weed kill efficiency (%), fresh weed biomass (kg ha⁻¹), 1000-grain weight (g), biological yield (kg ha⁻¹), and grain yield (kg ha⁻¹) were significantly affected by the different herbicidal treatments. Statistically Buctril M 40EC treatment exhibited the best performance, with maximum weed kill efficiency (47.2%) and minimum fresh weed biomass (400 kg ha⁻¹) as compared to weed biomass (1102 kg ha⁻¹) in the weedy check. Similarly, number of spikes (506 m⁻²), number of grains spike⁻¹ (57.3), thousand grains weight (46.6 g), biological yield (16750 kg ha⁻¹) and grain yield (1970 kg ha⁻¹) were the highest in Buctril M 40EC treatments as compared to weedy check having (400 m⁻²), (50.2), (41.4 g), (10850 kg), and (1653 kg ha⁻¹), respectively.

Keywords: Wheat, *Triticum aestivum* and weed control, herbicides

2006 / 231

Responses of an Arid-land Plant Community to Simulated Changes in Rainfall Pattern

Mohammad Jankju Borzelabald

Department of Range and Watershed Management
Faculty of Natural Resources, Ferdowsi Mashhad University, Mashhad, Iran

e-mail: mjankju@ferdowsi.um.ac.ir

Abstract

Understanding effects of rainfall pattern on plant interactions is a prerequisite for anticipating the effects of climate change on communities and ecosystems. We tested effects of growth season rainfall pattern on the individual performance, and interaction between, arid land plants. Same amount of water was applied, either as pulses of high frequent- small size or pulses of low frequent- large size on natural vegetation of an arid rangeland, in Nasr-Abad, Yazd, Iran. Effects of rain size were more significant than those of rain frequency. There were linear increases in performances of both annuals (density) and perennials (current year growth), and a shifts in plant interaction (from facilitation to competition) as the magnitude of pulse sizes increased linearly from 0, to 10 and 20 ml per event. Accordingly we suggest that rainfall size represent a significant niche dimension for richness maintenance in arid ecosystems. Large rain events create a greater opportunity for perennials to increase their biomass or reproduction yield, and for annuals to increase establishment in open spaces. However under small rain events, facilitative effects by perennial shrubs, and decreased competition intensity, may maintain plant diversity under harsh climatic conditions of arid ecosystems.

Keywords: pulse size, arid land, competition, facilitation, climate change

2006 / 232

Rainfall Estimation in Hamedan Province Using Geostatistical Methods

G. Golmohammadi¹, S. Maroofi¹, K. Mohammadi²
¹BooAli University, Hamedan, Iran

² Presenting Author:
Dr. Kourosch Mohammadi
Tarbiat Modarres University, Tehran, Iran
e-mail: kouroschm@modares.ac.ir

Abstract

Rainfall is an important phenomenon especially in dryland areas. Usually, the number of stations to monitor the rainfall occurrence is not sufficient in those areas; therefore, an accurate interpolation method is necessary. In recent decades, geostatistical methods have been used extensively for interpolation of different spatial parameters. In this paper, the applicability of the geostatistical methods in estimation of rainfall in Hamedan province located in west of Iran has been investigated. In Hamedan province, rainfed agriculture is used for wheat and barely and rainfall has important affect on farmers' economy. In order to generalize the results for the area, three different meteorological years, dry, normal and wet, were selected. In addition, yearly average precipitation was used to compare the results with the three

selected years. All analysis was done in GIS environment and for assessment of the methods, cross validation graph and comparing between the observed and calculated values were used. Results showed that radial basis function with thin plate spline function had better performance and it can be recommended for the province.

Keywords: geostatistic, rainfall, Hamedan Province, Interpolation

2006 / 242

Predicting the Geographical Distribution of Plant Species in Poshtkough Rangelands of Yazd Province-Iran

M. A. Zare Chahouki¹, M. Jafari, H. Azarnivand, M. Shafizadeh

Faculty of Natural Resources, Tehran University, Karaj, Iran

¹Presenting Author: e-mail: mazare@ut.ac.ir

Abstract

The aim of this research was to study the relationships between the occurrence of plant species and environmental factors and provide a predictive habitat model for each plant species in Poshtkoh rangelands of Yazd province. After the delineation of the study area, sampling was conducted using randomized-systematic method. Plant species data such as: presence or not, density, and percent cover were collected for each plot. The topographic conditions were also recorded for the plot areas. Soil samples were taken at depths of 0-30 and 30-60 cm in each plot. The measured soil variables included texture, lime, saturation moisture, gypsum, acidity (pH), ECe and SAR. Logistic regression technique was used to analyze the data. The results showed that the vegetation distribution is mainly related to soil characteristics such as EC, saturation moisture, gypsum, gravel and lime. The presence of *A. sieberi* was inversely related with EC. *D. ammoniacum* was negatively related with saturation moisture, gravel, and lime, while the presence of *Ep.st-Zy.eu* was positively related with gypsum.

Keywords: Logistic regression, Environmental factors, Plant species, *Artemisia sieberi*, *Dorema ammoniacum*, *Ephedra strobilacea*, *Zygopyllum eurypterum*.