Annals of Arid Zone 28 (3&4): 197-200, 1989

INVESTIGATIONS ON MONTHLY WIND EROSION CLIMATIC FACTOR OVER KARNATAKA STATE, INDIA

V.S. RAMACHANDRAN AND M.B. RAJEGOWDA

ABSTRACT

The mean monthly local wind erosion climatic factor (C) was computed on monthly basis and its distribution pattern over Karnataka State at various geographical locations is described. It was found that the C factor varied from high to very high intensity over north-interior and eastern portion of south-interior Karnataka, moderate to low intensity over westward side of the south-interior and very low intensity over coastal Karnataka State. The highest and lowest values of C factor were noticed during the months of June and October, respectively, while the corresponding coefficient of variation in March and June. The C factor was found to have the highest intensity over the State during the south-west monsoon season while the lowest intensity was during early part of summer and later part of winter seasons.

INTRODUCTION

Wind erosion damages soil, crops and the environment by reducing soil productivity affecting plant emergence, quality and increasing atmosphere particulates (Lean, 1983). The wind is a renewable source of natural energy and its erosive influence varies inversely as the square of the Thornthwaite's precipitation - evaporation index (Ven Te Chow, 1964) and directly with the cube of the wind velocity (Chepil et al, 1962; Woodruff and Siddoway, 1965). Erosion of soil by wind at Indian climatic conditions was already enunciated (Mishra and Kaul, 1959; Krishnan and Gupta, 1977). The wind erosion process, the motive force behind erosion and the methods for estimating the amount of soil moved including various wind erosion control principles and practices were discussed by earlier workers (Rao and Krishnan, 1981).

In Karnataka State, wind velocities generally remain light (0-5 kmph) to moderate (6.1-12 kmph) with some strengthening in force during the south-west monsoon season in the southern part, while strong wind velocities varying from high (12.1-18 kmph) to very high intensity (> 18.1 kmph) exist in most parts of the districts over northern portion almost throughout the year (IMD 1984). With the advance of the summer season, the State would be exposed to wind velocities (ranging from 7.6-10.3 kmph) varying mainly between south-westerlies to westerlies which were deemed to be the dust raising harmful surface winds. During the post-monsoon, season, wind velocities prevail mainly easterly to north-easterly over the State.

um to very high intensity along the tract of the dryland zone of the State which was characterised by low and erratic rainfall, temperature extremes, strong winds, high evaporative demands and poor soils.

CONCLUSIONS

The magnitudes of the wind erosion climatic factor had direct influence on soil erosion as well as soil crust and hence the intensity had direct proportionality with crop productivity. The intensities of above moderate C factor which usually occurred during kharif crop growing season in the State were harmful to crop growth, development and yield. The wind erosion direction would be towards the most frequently observed wind direction during that particular month. Wind break plantings in the form of shelter-belts of adapted trees or shrubs species properly spaced or areal coverages of stubble mulching on soil and certain commercially available soil stabilizers applied at certain technical rates could provide the temporary control on the wind erosion especially on cropped lands (Rao and Krishnan, 1981).

In high to very high wind erosion places, the combatness practices like implementation of modern agronomic methods namely contour cultivation and changing the normal orientation of rows of crops in the direction perpendicular to the prevailing wind direction could be adopted.

REFERENCES

Chepil, W.S., Siddoway, F.H. and Armbrust, Dean V. 1962. Climatic factor for estimating wind erodability of farm fields. Journal of Soil and Water Conservation. 17(4): 162-165.

IMD, 1984. Climate of Karnataka State. India Meteorological Department, Government of India, New Delhi. 11-27.

Krishnan, A. and Gupta, J.P. 1977. Dust movement under different land use conditions in the arid zone of western Rajasthan. Vayumandal. 7 (3&4): 41-43.

Lean, Lyles, 1983. Erosive wind energy distributions and climatic factors for the West. Journal of Soil and Water Conservation. 38(2): 106-109.

Mishra, D.K. and Kaul, R.N. 1959. Erosion of soil by wind. Journal of Soil and Water Conservation in India. 7 (4&5): 24-27.

Rao, G.G.S.N. and Krishnan, A. 1981. Influence of shelterbelts on wind speed reduction. Indian Journal of Ecology. 8(1): 8-16.

Ven Te Chow (ed). 1964. Hand book of Applied Hydrology. A Compendium of Water resources Technology. Section 11: 1-33.

Woodruff, N.P. and Siddoway, F.H. 1965. A wind erosion equation. Proceedings of the Soil Society of America. 29(5): 602-608.