

## MANAGEMENT OF SOIL CRUST IN POTHWAR AREA UNDER RAINFED CONDITIONS

M.M.I. Nizami, M. Salim, M. Sharif Zia. LRRI, NARC Islamabad.

### ABSTRACT

*In rainfed area, soil crusting is one of the major problems having different intensity in different soils. A field experiment was conducted to find out the most suitable soil crust management practices for four soil series of Pothwar. The soil crust management practices selected were: hoeing, farm yard manure application, poultry waste application and mulching. The results revealed that intensity of soil crust depended upon the kind of soil and soil crust management practice adopted. As a result of the four experimental treatments, plant population and soil moisture status during growth period was different on the same soil. The maize grain yield varied with soil crust management practices within a soil series. It also had differential response among different soil series. Hoeing proved to be best treatment for Guliana soil series, hoeing and mulching were equally good for Missa soil series, mulching was good for Pir Sabak soil series while poultry waste and farm yard manure application were equally beneficial in Balkassar soil series.*

### INTRODUCTION

Soil crusting is a world wide problem occurring under a wide range of soil and climatic conditions (Page and Quick, 1979). Soil crust affects seedling emergence (Gerard, 1980) and thus results in reduction in crop yield. Soil crust within a climatic zone is dependent on soil physical properties and soil management (Bradford *et al.*, 1987). It is characterized and distinguished by their mechanical strength, markedly low porosity, higher bulk density, low degree of aggregation and higher amount of silt and

crust. In Pakistan not much research work has been done on the intensity (strength) of soil crust and its effects on plant population and grain yield of cereal crops. Nizami and Khan, 1991 reported that intensity of soil crust, decrease in yield and plant population due to it, differed from one soil to another. Soil crust intensity ranges from 1.8 to 5.6 kg/cm<sup>2</sup>, the yield decreases from 5 to 23 per cent while plant population decrease from 5.9 to 27.8 per cent in three soils under rainfed conditions. However, no research work has been reported in Pakistan on the management of soil crust. The study was therefore undertaken to find out the most appropriate soil crust management practice for the selected soils under rainfed conditions.

### MATERIAL AND METHODS

Four benchmark soils namely Guliana convex phase, Missa gently sloping, terraced, Pirsabak level to nearly level phase and Balkassar convex phases belonging to (i) Fine-silty, mixed, hyperthermic, Udic Haplustals convex phase (ii) Coarse-silty, mixed hyperthermic, typic Ustochrepts soil families respectively were chosen for study. Soil profiles were described according to the Soil Survey Manual (Soil Survey staff, 1951) from soil pits (1m x 1.5m x 1m) dug at each site and classified according to Soil Taxonomy (Soil Survey Staff, 1975). One composite soil sample of the top layer (0-15cm) was taken from each site for physico chemical analysis