EFFECT OF SOIL COMPACTION AND ORGANIC MATTER ON GROWTH OF WHEAT CROP

Manzoor Ahmad M.S. Sabir* M. Aslam***

ABSTRACT

This study was conducted to investigate the effect of soil compaction and organic matter on the growth of wheat crop. The soil was placed in the earthen pots containing @ 0.47, 1.45, and 2.95% organic matter and compacted to achieve three different soil bulk density levels viz 1.2, 1.3 and 1.4 g/cm^3. The results indicated that organic matter and soil bulk density affected significantly the shoot and root length, shoot fresh weight and number of tillers per plant. Maximum plant height, root length, shoot wheight and number of tillers per plant were 43.17 cm, 14.80 cm 10.60 g and 5.3 respectively for the corresponding treatment combination of organic matter and soil bulk density of 1.45% and 1.2g/cm^3.

INTRODUCTION

The efficient production of crops by mechanization is often limited by poor stand of crops. Some of the emergence failures are directly correlated to problems other than soil physical environment such as insects, wind damage, poor germinating seeds etc.

However, most failures are direct or indirect results of improper environment around the seed. Thus the environment in relation to plant growth, this study was designed to investigate the effect of different levels of organic matter and soil bulk density on the growth of LU 26s wheat variety.

MATERIALS AND METHODS

An experiment to study the effect of soil bulk density and organic matter on the growth of wheat was conducted in the laboratory. For this purpose wheat cultivar LU 26s was sown in pots. Sandy clay loam soil collected from top 15 cm from cultivated area was used for this research. The soil was air dried, ground and passed through 2 mm sieve. The soil was divided into three lots to mix 0.47, 1.45 and 2.95% of organic matter one month prior to the sowing of crop. The sowing depth and moisture content were maintained at 5 cm and 16% (d.b) respectively, whereas fertilizer level and atmospharic conditions were uniform. All the treatments were repeated thrice and there were 27 treatments in all.

At the time of sowing three levels of bulk density for each moisture level were created by compacting the soil by slow loading rate method with the help of mechanical press. These being equivalent to 1.2, 1.3 and 1.4 gm/cm^3. Hadas, (1987) claimed that when loading was done at slow rate, uniform stress

S.D
0.09
0.31
0.02
2.97
76.34
0.31
4.19
6.16
4.71
66.39
0.05
1.51

S.D.
1.189
4.198
6.475
2.869
3.390
166.050
10.906
174.70