Online Library Residual Effects Of Different Tillage Systems on Soil Physical Characteristics and Crop Growth. This chapter presents a comprehensive overview of the relationships between soil physical characteristics and crop growth. It discusses the effects of different tillage systems on soil physical properties and their implications for crop production. The chapter also examines the role of soil physical characteristics in determining soil fertility and crop productivity. It highlights the importance of soil physical characteristics in shaping soil management practices and crop management strategies. The chapter concludes with a discussion of the future directions and research needs in the field of soil physical characteristics and crop growth.
The highest value of crop yield at any given planting density occurred in MPD plot and decreased in DPD and RC plots, respectively, in 2008 and combined two years. This result could be due to lower BDa and Agga2mm, higher MWDD and Pt in upper layer (0-15 cm) for MPD plot. However WI was higher and RP was lower in RC plot at the same depth. The other reason for sweet corn reduction in RC plot could be higher BDa and BP at the depth of 20-31 cm that impeded root growth of sweet corn; however BC's was higher in lower layer. Depth of soil under BC (15 cm) and creation of plough pan below this depth (plough layer) was the other reason for the lower yield under RC. Tillage method, planting density and also interaction effects of two factors, tillage and planting density were found to be significant on yield and some yield components of sweet corn such as ear diameter, row length of the kernels on the cob and with weight of ear, yield of sweet corn and final weight of dry matter, in 2008. Similarly, all yield parameters except for ear diameter were affected by planting density and interaction of the two factors in 2008. Irrespective of planting density, corn yield was lower in RC tillage in 2009 and for the combined two years. Crop yield with DPD was 9% higher than RC and with MPD it was 10% higher than RC. Ear diameter, row length of kernel on cob and weight of ear were higher at low density compared to high density planting. This could be due to the lower stress on competition between the plants for moisture, nutrients and sunlight under low density planting. Although the stress was higher for the plants with seed spacing of 20 cm, however it did not affect the crop yield and total weight of dry matter at any given tillage method. This result revealed there was no deficit of moisture and nutrients for the plants close to each other. Only the limitation of moisture could be the reason for this finding. Various climatic factors such as temperature and rainfall were higher in 2008 in terms of greater rainfall and sunshine hours. That is why the yield and some yield components of sweet corn were better in 2008 as compared to 2009 for DPD and RC plot. Energy consumption on drawbar power was higher on the soil ploughed with DPD was 56.2 hp and decreased with MPD (52.5 hp) and RC (49.3 hp), respectively. While fuel consumption was higher on the soil ploughed with MPD (17.02 L) and decreased to 15.04 L with DPD and 13.04 L with RC, respectively. Although energy on drawbar power and engine fuel consumption was higher under MPD and DPD tillage treatments as compared to RC, there was greater benefit gained in MPD plot (29%) and DPD plot (9%) respectively. On the other hand, the highest profit was obtained in MPD plot (RM 32,000) and this decreased to RM 18,900 in DPD plot and RM 18,100 in RC plot respectively. In general, working condition of two tillage methods (MPD and DPD) was similar in trend in terms of soil physical properties, yield and its components of sweet corn. However, mouldboard plough to a depth of 25 cm followed by one time tandem disc harrowing to a depth of 10 cm with seed spacing of 20 cm showed the best overall results in terms of yield and economic benefit.