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Evaluation of soil heat flux density as a function of soil management practices

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Soil energy is an important parameter in order to understand the flux of energy between the plant and the soil. This parameter could determine the potential for future production of soil. Pattern of surface energy flux varies depending on several factors, mainly on coverage. Also, this behaviour is strongly conditioned by the physical condition of soil. In order to evaluate the trend and behaviour of soil energy depending on soil coverage the aim of the present study was to evaluate soil heat flux density (G) in three different soil conditions depending on seasonal weather temperatures. Therefore, the authors monitored soil energy every half hour from soil located on bare soil, on soil covered by crops at root level and in between crop rows. The selected crop was corn. Soil heat flux density was measured with a heat flux plate sensor buried at a depth of 0.05 m in experimental sites. The change in heat storage in the soil layer above the heat flux plates was measured by inserting temperature sensors at an angle from near the bottom to near the top of the soil layer (above the plate sensor). The results indicated that the soil energy flux depends mainly on radiation and soil conditions. Although net radiation (Rn) was the same for all the sites, the evolution for G is different. Greater G fluctuation is produced in bared soils and decreases as soil is covered by the crops, especially at root level.