This study determined carbon dioxide (CO2) emissions from the cultivation of chickpeas cultivated in Usak using conventional wheat-chickpea crop rotation methods as a function of conventional tillage (CT), reduced tillage (RT), and direct seeding (DS). Measurements of carbon dioxide (CO2) emissions from the soil were started after planting using a portable CO2 measurement system (PP System) for a period of 55 days. Our results indicated CO2 emissions at rates of 4.1, 4.5, and 5.3 g·m−2·h−1 in response to the CT, RT, and DS treatments, respectively. A significant difference was found between CT and RT, and CO2 emissions under the DS treatment were higher than those of the other two treatments (p<0.05). Soil evaporation rates were estimated at 11.6, 10.9, and 13.1 g·m−2·h−1 under the CT, RT, and DS treatments, respectively. Mean soil temperature was 17.5, 18.1, and 18.3°C for the CT, RT, and DS treatments, respectively (p<0.05). Mean values of soil moisture content (wet base) after tillage were 19.7%, 19.1%, and 18.8% for CT, RT, and DS, respectively. Soil temperature and seedbed preparation methods appeared to influence soil CO2 emissions.