**Investigation of CO2 emission from cereal production of Iran**

 **(wheat, Barley and Corn)**

**Abstract**

Carbon is an essential element for the growth and production of plants. Carbon dioxide (CO2) is absorbed from the atmosphere and fixated in the plants through the process of photosynthesis. Increased concentrations of greenhouse gases such as CO2, methane and nitrogen oxides trigger widespread climate change and the consequently rise the Earth's temperature. The term carbon footprint has been proposed in response to climate change for food products. The concept of carbon footprint is often adopted as a synonym for CO2 emissions or other greenhouse gases that are expressed as carbon dioxide equivalent. The carbon footprint is the analysis of the total greenhouse gas emissions from inputs in the production cycle of a product. In order to evaluate the greenhouse gases emission in wheat, barley and Corn production of Iran, this study was conducted. The data was collected for 5 years (2006-2011). Data collected included the amounts of fertilizers (N, P and K), herbicides, insecticides and fungicides used, human labor, diesel fuel, and total yield for each crop. Result showed that the total carbon emission of wheat, barley and Corn production systems were 6579.18, 4339.4 and 9162.86 kg CO2-equivalent per hectare respectively. Leaching of nitrogen fertilizers and diesel fuel were the most important pollutants of environment in terms of carbon emission in these crops. The result also showed that barley had a lower carbon footprint (0.4) than Corn (0.41) and wheat (0.47). Totally Barley farming system in Iran was more efficient than wheat and barley farming systems in terms of CO2-equivalent indices. Finally, increasing the water and fertilizer use efficiency of farms and replacing the conventional tillage with conservation tillage or no-tillage would be useful for reducing carbon footprint and therefore improvement of the agricultural sustainability in Iran.

**Kay words:** Wheat, Barley, Corn, Carbon Footprint, GHG Emission.