

Impact of Wastewater Irrigation on Soil and Vegetable Quality in Peri Urban Cropping System

Authors : Neelam Patel

Abstract : Farmers in peri-urban areas of developing countries depend on wastewater for Irrigation but with great environmental and health hazards. Since, irrigation with wastewater is growing in the developing countries but its suitability to environment and other health factors should be checked. Metal pollution is a very serious issue these days, various neuro, physical and mental disorders are prevailing due to the metal pollution. Waste water contaminated with heavy metals got accumulated in the soil and then bioaccumulated in the vegetables irrigated with waste water. A 3-year field experiment on cauliflower has been done by using wastewater with two different methods of irrigation i.e. Drip and Flood irrigation and checked the impact on the cauliflower and soil quality. Heavy metals (Cr, Cu, Ni, Zn and Pb) have been studied in wastewater used for the irrigation and their accumulation in the soil and vegetable was studied. The study reveals that the concentration of heavy metals increases by 100 times from initial in soil. After 3 years, the concentration of Copper(41 ppm) Chromium(39.4 ppm) Lead(62.2ppm) Zinc(100.5 ppm) and Nickel(75.7 ppm) in Flood irrigated soil while in Drip irrigated soil , Copper (36.4 ppm) Chromium(36.8 ppm) Lead(53.7 ppm) Zinc(70.3 ppm) and Nickel (53.9 ppm). In vegetable, the wastewater irrigated shows an increase in the concentration of metals with the time and the accumulation of Nickel (6.98ppm), Lead (30.18 ppm) and Zinc (55.83 ppm) in drip irrigated while in flood irrigated, Nickel (30.58 ppm), Lead (73.95ppm) Zinc (93.50 ppm) and Copper (54.58 ppm) in edible part of cauliflower which is above the permissible limits suggested by different international agencies. On other hand, the nutrients content i.e. Nitrogen, Phosphorus and Potassium in soil was increased in concentration with time. The study pointed out that the metal contaminated waste water consisting the nutrients in it but also heavy metals which causes health issues in human. While the increase in concentration of nutrients in the soil indirectly helpful to the farmers economically by restricting the use of fertilizers. But the metal pollution directly affects the health of human being. The different method of irrigation suggested that the drip irrigated vegetable acquired less metal then the flood one and is a better combo with the waste water for the irrigation.

Keywords : drip irrigation, heavy metals, metal contamination, waste water

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020