



An analytical study of nitrate-nitrogen on vegetables from different markets of Allahabad

L.S. KHARSYNTIEW, R. BHAROSE, SUSHIL KUMAR¹ AND T. THOMAS*

Department of Soil and Environmental Sciences, Sam Higginbottom Institute of Agricultural Technology and Sciences, ALLAHABAD (U.P.) INDIA (Email : thomasaidu@gmail.com)

Key Words : Nitrate, Nitrogen, Vegetables

View Point Article : Kharsyntiew, L.S., Bharose, R., Kumar, Sushil and Thomas, T. (2014). An analytical study of nitrate-nitrogen on vegetables from different markets of Allahabad. *Internat. J. agric. Sci.*, **10** (1): 474-476.

Article History : Received : 25.10.2013; Accepted : 21.12.2013

Nitrogen is an essential plant nutrient that often limits crop production. Consequently nitrogen sources, such as chemical fertilizers and manure, are sometimes applied to meet crops nutrient requirements. It is a plant food most often applied to vegetable crop as fertilizer, and this nutrient is responsible for green leafy growth. Insufficient nitrogen results in poor crop growth and low yields. The nitrate form of nitrogen (NO_3) is especially prone to contamination of ground and surface waters and also responsible for contamination when excessive amounts are applied to crops. Agriculture is considered as the major source of releasing nitrate into the environment. Fertilizers use is rapidly increased, causing excessive loading into the environment.

Nitrogen compounds are also accumulated in some plant tissues. More than three quarter of our average intake comes from the vegetables, which provide about 80% of the average daily dietary intake. Vegetables that may accumulate nitrate in their tissues are leafy vegetables such as spinach, lettuce and cabbage, or root crops like carrot, beetroots, potatoes, radish, and other like cauliflower, beans and peas. The nitrate in vegetables is derived primarily from the nitrate added fertilizers.

Application of chemical fertilizers and farmyard manure affects crop productivity and improve nutrient cycling within soil-plant system, but the magnitude varies with soil-climatic conditions. Nitrate nitrogen leaching is a major problem for

soils in which ammonium (NH_4) is quickly nitrified to NO_3 . It has become a major concern worldwide, mainly due to increased N fertilizers and farmyard manure inputs nitrates and nitrites seemed to be among the chemicals that may cause pollution; many studies have expected the effect of these compounds on the environment and on the living health. These studies focused on the nitrate and nitrite content on water and vegetables consumed by humans. In order to control the nitrate and nitrite intake by consumers in general and on babies in particular who are the most vulnerable to the adverse effects of these compounds, a minimum acceptable of these compounds were suggested. The acceptable daily intake (ADI) of nitrate and nitrite set by European Commission's Scientific Committee for Food (ECSCF), is 3.7 mg/kg body weight, and 0.06 mg/kg body weight, respectively (WHO, 1995).

The maximum safe and / or regulatory limits for nitrate in drinking water, vegetables, forage/food stuffs (WHO, 2007) are well within the detection range, 0.5-10 ppm N, of acid reduction method for nitrates. The mean concentrations of 9.1 ppm as nitrate N and 0.7 ppm as nitrite N in the present study would suggest good nitrogen quality of the test soil. vegetables contribute dominantly, 60 to 90% or above, to dietary nitrate intake in humans followed by water (Chiroma *et al.*, 2007). Many workers have determined the nitrate and nitrite contents of the prepared infant cereal foods and

* Author for correspondence

¹Department of Agricultural Chemistry and Soil Sciences, C.C.R. (P.G.) College, MUZAFFARNAGAR (U.P.) INDIA