Soil fertility is the ability of soil to sustain plant growth and optimize crop yield. This can be enhanced through organic and inorganic fertilizers to the soil. Nuclear techniques provide data that enhances soil fertility and crop production while minimizing the environmental impact. An integrated soil fertility management aims at maximizing the efficiency of the agronomic use of nutrients and improving crop productivity. This can be achieved through the use of grain legumes, which enhance soil fertility through biological nitrogen fixation, and the application of chemical fertilizers. Soil fertility management is very important for sustainable food production and maintenance of the environment. Fertilizer use and improved varieties were some of the major ingredients of the green revolution in Europe, Latin America, and Asia. Africa is the remaining region in the world with decreasing food production per capita. Soil scientists that focus on soil fertility are interested in managing nutrients to improve crop productivity. They focus on using commercial fertilizers, manures, waste products, and composts to add nutrients and organic matter to the soil. Sometimes they also add chemicals that change the pH to a more optimum level for nutrient availability to plants. Soil fertility experts must also be careful to ensure that practices are environmentally sustainable. Inappropriate management of nutrients can lead to contamination of lakes, rivers, streams, and groundwater. In addition, adding amendments to th...