Biotech rice cuts pesticide and energy use compared to non-GMO counterpart, study finds

The release of environmental emissions, which partly emanates from the application of chemical inputs, is a major global concern. Planting crops that have been genetically modified (GM) is one possible solution for reducing negative impacts on the environment and human health. The life cycle of genetically modified (GM) and non-GM rice cultivars was assessed.

Four GM lines …. and conventional cultivars (non-GM parents) were cultivated under a standard biosafety protocol in three isolated regions in the north of Iran. In order to conduct a life cycle assessment analysis, at first, the results of low- and medium-yielding cultivars in each region were analyzed separately. Since there were no differences among the impact categories and indices in different regions, the average for the results of the three regions is presented.

Results show that decreased application of pesticides in GM cultivars led to less energy utilization, emission of greenhouse gases, and global warming potential (GWP). The highest amount of GWP, cumulative non-renewable energy demand, terrestrial acidification, freshwater eutrophication, marine eutrophication, and water depletion were observed in the non-GM cultivars. The heavy metals emitted in air (Pb, Cd, Zn, and Hg) and water (Cr, Zn, Cu, Cd, Hg, Pb, and Ni) were less in GM cultivars than in non-GM cultivars. Pollutants emitted from soil (nitrate, metals, and pesticide) in GM cultivars derived from ‘Khazar’ were less than their non-GM parent.

As a result, we conclude that the level of emission of environmental emissions is directly related to the application of input and method of field management, which was based on the lowest level of these indices obtained when GM cultivars were produced. Therefore, the emissions released from environmental issues are positively correlated with the application of inputs and field management practices.

Read the original post (Behind paywall)