

Poster

ENVIRONMENTAL IMPACT ASSESSMENT OF HERBICIDES USED IN RICE FARMING IN SRI LANKA

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ABSTRACT

The environmental hazard has been estimated using a method that assesses the environmental impact of pesticides. It is the methodology developed by Kovach *et al.* (1992) known as Environmental Impact Quotient method (EIQ) and. The EIQ is regarded as relatively easy to use and has been presented in the scientific literature as a useful tool for estimating potential environmental hazards associated with agricultural pesticide use in diverse environments. There are two categories of values for EIQ, one of them is called “base environmental impact quotient” and it has been established for each molecule of pesticide (active ingredient of the agrochemical) and the toxic effect on workers, pickers, consumers, fish, birds, bees and beneficial arthropods must be taken into account for calculating this value. The other one is called “field environmental impact quotient”, and is calculated for the agrochemical products used by the farmers and the correlation of the base EIQ value, active ingredient percentage, quantity of the product used, field size and frequency of application of the product are used for calculating this value. The formula for determining the EIQ value of individual pesticides is listed below and is the average of the farm worker, consumer, and ecological components.

$$EIQ = \frac{C[(DT*5)+(DT*P)] + [(C*((S+P)/2)*SY)+(L)] + [(F*R)+(D*((S+P)/2)*3)+(Z*P*3)+(B*P*5)]}{3}$$
 Where, DT = dermal toxicity, C = chronic toxicity, SY = systemicity, F = fish toxicity, L = leaching potential, R = surface loss potential, D = bird toxicity, S = soil half-life, Z = bee toxicity, B = beneficial arthropod toxicity, P = plant surface half-life. This assessment was done to compare the impact of selected herbicides. Commonly used 12 herbicides were selected for the assessment. EIQ values were calculated for 01 ha using EIQ calculator which is available online at <http://www.nysipm.cornell.edu/EIQCalc> for 01 ha.

Among selected herbicides, Propanil 360 g/l EC has shown the highest field use EIQ i.e. it has the biggest impact. Ethoxysulfuron 15% WG has shown the lowest field use EIQ i.e. it has the lowest impact. Ecological impact of MCPA 600 g/l SL, MCPA 400 g/l SL and Glyphosate 360 g/l SL were also higher in comparison to other herbicides. Azim sulfuron 50% WG, Bispyribac sodium 100 g/l, Bispyribac sodium 20% WP, Penoxulam 240 g/l SC, Cyhalofop-butyl 100 g/l, Fenoxaprop-p-ethyl 75 g/l EW, Ethoxysulfuron 15% WG and Carfentrazone-ethyl 240 g/l EC have shown lower field use EIQ and therefore they can be considered as more environmental friendly herbicides.