

RISK ASSESSMENT OF WATER CONTAMINATION BY AGROCHEMICAL IN WATERSHED.

A. J. B. LUIZ; M. C. NEVES; M. A. F. GOMES; C. A.
SPADOTTO & A. LUCHIARI Jr. EMBRAPA/CNPMA -
E.mail: alfredo@cnpma.embrapa.br

Intensive agricultural systems are based on the heavy use of pesticides and fertilizers. This fact offer a high contamination risk of the natural resources, even when adequate technical of storage, application and disposal are used. Brasil used in 1993 61,845 t of active ingredients of pesticides (insecticide, fungicide and herbicide) and 11,424,635 t of fertilizers (phosphorus, nitrogen and potassium), being the application rates variable as a function of region and crop plants. The use was very high, for example, in corn, cotton, orange, potato, soybean, sugar-cane and tomato in the east region of Rio Paraná basin.

The risk of agrochemical contamination of the natural resource varies according to the environment and product properties, therefore it is necessary to improve the knowledge about environment/product relation in order to permit a space-temporal management on application of these products, to reduce the risks.

In our country, because its large surface area (8,500,000 Km²) the data of environmental properties are poorly detailed and are not continuous in time and space. We have access to good information about properties of the used products, but few information is available about the quantity, the site and the method of their application. This work was done with all these things in mind and with the objective of the establishment of a method which permits a first approximation, to identify areas with high risk of water contamination by agrochemical.

We decided only use data which are available to everyone, in order to facilitate the method acceptance.

The basic idea was that the water is the main agrochemical transport medium after its application in the crop field, and the environmental properties involved in the water moving (here considerate only in liquid state) are soil type, terrain slope and precipitation rate.

An algorithm was built, based upon logical relationship matrixes, which permits to establish the water runoff and infiltration potential by crossing information of soil and terrain slope. This crossing was done by geographic information system IDRISI, using like example the data of the Córrego Espraiado watershed, Ribeirão Preto county, São Paulo, Brasil. Maps were generated with the localization of the areas with high, medium and low water runoff and infiltration (one is opposite of the other) potentials. The areas were quantified, resulting that from the total 4,463ha of the watershed, 1,779ha had high (low) runoff (infiltration) potential, 1,848ha had medium runoff and infiltration potential, and 836ha had low (high) runoff (infiltration) potential.

Maps which permits the identification of the areas which have greater risk of water contamination in the watershed has been generated. These maps can be made on monthly, seasonal (dry, normal and rainy seasons) or annual basis, for the main products used in most common crops in the region. The method may be used in any other watershed that has similar data availability.