



Symbolic learning of relationships between agricultural activities and water quality from simulations for decision support.

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Analysing the behaviour of an environmental system by a simulation model is difficult because of the numerous variables and the interactions between the simulated processes. Symbolic learning techniques have been used to learn classification for decision support by using a simulation model. This simulation model is an integrated model which represents and couples the decision rules for pesticide applications and the water and pesticide transfer by surface and subsurface flow over an agricultural catchment. The spatial structure of the catchment is defined as a set of plot outlet trees feeding the stream. These tree structures are labelled at each node by attributes. Simulations are divided in three groups corresponding to low, medium and high water contamination. Two learning methods have been developed and compared to separate these three groups. In the first method based on inductive logic programming, tree patterns are generated, whereas in the second method, the information contained in the trees are synthesized and attribute-value rules identified. The first method, time consuming, informs about the spatial organisation of the fields over the catchment. The second one, quicker, informs on the agricultural practices. To help the decision making process, the learning methods are incorporated in a visualization tool.