O.23 - Formal tools of automation may support design of decision systems for integrated pest management

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We consider here pathosystems whose modelling in terms of epidemics and damage makes it difficult, or even impossible, to compute optimal crop protection strategies, such as protecting from grapevine mildews. IPM strategies and decisions should use available epidemiological knowledge as well as expertise which include knowledge and facts about phytosanitary products, resource management, behaviour of plots and cultivars, and local warning systems for bioclimatic risk. We argue here that this expertise can be used to design decision frameworks and that formal tools facilitate deep and consistent design which can then be transferred to technical advisers and growers. We focus on some key issues from an example of such a design framework named GrapeMilDEWS (Grape Mildews DEcision Workflow System). From the automation point of view, GrapeMilDEWS is a controller of a dynamic system, and was modelled with the graphical language of Statecharts. In the field of human pathology, some scientists are also promoting formal means of studying consistency of decision and diagnostic guidelines. Formal design of decision strategies requires interdisciplinary scientific effort, which we believe could contribute to theoretical and practical innovation. We end up by showing how formal tools could be used to describe requirements that a desirable crop protection decision method should have. In the case of incomplete knowledge about a pathosystem, testing the conformance of different decision methods according to a shared and well-defined requirement set may help to enhance agricultural practices and scientific exchange.