Can *M*odels be *U*seful for *D*eciding to *C*onvert to organic *F*ruit *G*rowing? Proposals for a framework

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Multi-attribute decision models (MADM) are useful tools in the scientific and professional context, as they can help end users (farmers among a wide variety of users) in making decisions for complex problems or situations, without working on a quantitative and long-term basis. Literature attests that a variety of agricultural problems can be solved with computer modeling, especially in the case of perennial crops such as fruit trees with long-term management practices (Pacek et al., 2005). Alvisi et al. (1992) developed MULTIFRU for decision making in orchard management.

Various models have been developed for MADM applications (Electre, Hiview, Prime..., Belton & Stewart, 2002), but it seems that DEX-i has been more commonly used for agricultural purposes. The main characteristics of the DEX method is its capability to deal with qualitative variables.

Marko Bohanec for Institute of Mathematics of Maribor conceived of DEX-i (formerly DEX, as for 'Decision EXpert'), whereas Rozman is one of the agri-economists that developed agricultural applications, especially in organic farming.

Literature compiled on decision tools for helping fruit growers to convert to organic farming led to the publication of a significant number of papers offering theory and sociology aspects related to the transition to organic (Acs et al., 2006), but Rozman's papers gave a means to elaborate a qualitative tool that included a hierarchy of various determinants, including technical, social, and economic.

We aim to gain knowledge by using the DEX-i program and understanding its construction by starting with a simple question: Is my orchard suited for organic farming? .MADM will help achieve a cost-benefit analysis (CBA) under various scenarios.

In a second step, the model should be validated through field assessments and interviews of growers that already experienced conversion to organic, in order to compare the model results with the real situation of orchards.

Indeed, we may consider many failures of transition to organic farming because: the orchard was not adapted; the grower was not motivated enough; or the financial situation did not permit sustainable management.

In addition, many fruit growers may refuse to take the risk of going organic, although they may benefit from the transition.

Theoretical papers and models established five types of farmers with respect to their behavioral approach to organic farming: the committed conventional; the pragmatic conventional; the environmentally conscious but not organic; the pragmatic organic; and the committed organic.

Growers suffer (in France at least) from a lack of technical support, due to its cost. Asking advisors about the relevance of transition requires a considerable effort and time to assess the CBA of transitioning.

Our proposal is not to give a scenario with an exact estimation, but to give major themes and indications of major factors of risks and bottlenecks. Those indications may help the grower to improve planning before again considering the transition and running the model. We may not be able to be more accurate in the answers to be brought to the end-user. The aim of the tool is to avoid failures and discrediting of organic farming to the extent possible. Official transitioning should indeed be anticipated and prepared for, focusing both on the field and farming moral.

A complementary answer to the end-user is the AHP (Analytical Hierarchical Process) method, which gives quantitative evaluation of different scenarios. Pacek and Rozman also used AHP (Expert Choice© program) in evaluation of Slovenian organic farms (2005, 2006), and they concluded on the complementary contributions of DEX-i and AHP.

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