The “Grignon Model”:
Qualitative Assessment of Maize Cropping Systems

Marko Bohanec¹, Antoine Messéan², Sara Scatasta³, Martin Žnidaršič¹, Frédérique Angevin²,
Bryan Griffiths⁴, Paul Henning Krogh⁵, Sašo Džeroski¹

1 Jožef Stefan Institute, Department of Knowledge Technologies, Slovenia
2 INRA – Institut National de la Recherche Agronomique, Eco-Innov, Grignon, France
3 ZEW – Centre for European Economic Research, Mannheim, Germany
4 Scottish Crop Research Institute, Invergowrie, Dundee, United Kingdom
5 National Environmental Research Institute, Silkeborg, Denmark

ABSTRACT

An important goal of the SIGMEA project is to develop computer-based decision support systems (DSS) for the assessment of the impacts of using GM crops at the field and regional levels. Here we present the so-called “Grignon Model”, a qualitative multi-attribute model for the assessment of ecological and economic impacts of GM and non-GM maize crops at the farm level for one agricultural season. This is an ex-ante model developed according to the DEX methodology. In this model, cropping systems are described by four groups of features: (1) crop sub-type, (2) regional and farm-level context, (3) crop protection and crop management strategies, and (4) expected characteristics of the yield. The assessment of cropping systems is based on four groups of ecological and two groups of economic indicators: biodiversity, soil biodiversity, water quality, greenhouse gases, variable costs and production value. The evaluation of cropping systems is governed by expert-defined rules. In addition to the evaluation of cropping systems, the model facilitates various analyses (e.g., what-if analysis), identification of advantages and disadvantages of specific cropping systems, and generation of improved variations of existing cropping systems.

ACKNOWLEDGMENT

The “Grignon Model” model was developed in collaboration between the projects:

SIGMEA Sustainable introduction of genetically modified crops into European agriculture FP6-SSP1-2002-502981
ECOGEN Soil ecological and economic evaluation of genetically modified crops FP5-QLK5-2002-01666