



HAL
open science

Modelling climate change adaptation in European agriculture: challenges and priorities

Kairsty Topp, Vera Eory, André Bannink, Dave Bartley, Isabel Blanco-Penedo, A. Cortignani, Augustin del Prado, Gabriele Dono, Philippe Faverdin, Anne-Isabelle Graux, et al.

► To cite this version:

Kairsty Topp, Vera Eory, André Bannink, Dave Bartley, Isabel Blanco-Penedo, et al.. Modelling climate change adaptation in European agriculture: challenges and priorities. Macsur Science Conference 2017, 2017, Berlin, Germany. hal-02738262

HAL Id: hal-02738262

<https://hal.inrae.fr/hal-02738262>

Submitted on 2 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Topic: Improvements in modelling processes, interactions, and feedbacks

Submitting author: Topp, Kairsty

E-mail address: Kairsty.Topp@sruc.ac.uk

Affiliation: SRUC, UK

Modelling climate change adaptation in European agriculture: Challenges and priorities.

C. F. E. Topp^{1*}, *V. Eory*¹, *A. Bannink*², *D. J. Bartley*³, *I. Blanco-Penedo*⁴, *R. Cortignani*⁵, *A. Del Prado*⁶, *G. Dono*⁵, *P. Favardin*⁷, *A.-I. Graux*⁷, *N. Hutchings*⁸, *L. Lauwers*¹⁰, ¹¹, *Ş. Özkan Gülzari*^{12,13}, *S. Rolinski*¹⁴, *M. Ruiz Ramos*¹⁵, *D.L. Sandars*¹⁶, *R. Sándor*¹⁷, *M. Schoenhart*¹⁸, *G. Seddaiu*¹⁹, *J. van Middelkoop*², *I. Weindl*¹⁴, ²⁰, *R.P. Kipling*²¹

¹ SRUC, West Mains Rd, Edinburgh, UK, EH9 3JG

² Wageningen Livestock Research, P.O.Box 338, 6700 AH Wageningen, NL

³ Disease Control, Moredun Research Institute, Pentlands Science Park, Bush Loan, Penicuik, UK, EH26 0PZ

⁴IRTA, Animal Welfare Subprogram, ES-17121 Monells, Girona, Spain

⁵ Department of Agricultural and Forestry sciNcEs (DAFNE), Tuscia University, Viterbo, Italy.

⁶ Basque Centre For Climate Change (BC3), Parque Científico de UPV/EHU, Leioa (Bizkaia), Spain

⁷ PEGASE, Agrocampus Ouest, INRA, 35590, Saint-Gilles, France

⁸ Dept of Agroecology, Aarhus University, Postbox 50, 8830 Tjele, Denmark

¹⁰ ILVO, Social Sciences Unit Burg. Van Gansberghelaan 115, 9820 Merelbeke, Belgium

¹¹ Ghent University, Department of Agricultural Economics, Coupure Links 653, 9000 Ghent

¹²Department of Animal and Aquacultural Sciences, Faculty of Veterinary Medicine and Biosciences, Norwegian University of Life Sciences P.O. Box 5003, 1432 Ås, Norway

¹³Norwegian Institute of Bioeconomy Research P.O. Box 115, 1431 Ås, Norway

¹⁴Potsdam Institute for Climate Impact Research (PIK), Research Domain Climate Impacts and Vulnerabilities, Telegrafenberg A31, 14473 Postdam, Germany

¹⁵CEIGRAM-Universidad Politécnica de Madrid, ETSIAAB, 28040 Madrid, Spain

¹⁶ School of Water, Energy, and Environment (SWEE), Cranfield University, Cranfield, Bedfordshire UK, MK43 0AL

¹⁷MTA CAR, Institute for Soil Sciences and Agricultural Chemistry, Herman Otto út. 15, 1022 Budapest, Hungary

¹⁸ Department of Economics and Social Sciences, BOKU University of Natural Resources and Life Sciences, Feistmantelstraße 4, 1180 Vienna, Austria

¹⁹Desertification Research Centre and Dept. Agricultural Sciences, Univ. Sassari, Sassari, IT

²⁰Leibniz Institute for Agricultural Engineering and Bioeconomy (ATB), Max-Eyth-Allee 100, 14469 Potsdam, Germany

²¹IBERS, Aberystwyth University, 1st Floor, Stapledon Building, Plas Gogerddan, Aberystwyth, Ceredigion, UK, SY23 3EE.

*corresponding author

Climate change presents major challenges for European agriculture, and the speed, nature and extent of the responses to such challenges will have far-reaching social, economic and environmental consequences. Agricultural modelling has an important role in helping decision makers better understand the costs and benefits of different adaptation strategies, as well as trade-offs and win-wins between those strategies, mitigation measures and other economic, social and environmental goals. Incorporating adaptation strategies into biophysical, bio-economic and economic model is essential to gaining a more holistic understanding of their impacts, beyond the context of specific changes and purposes. Here, the ability and potential of agricultural models to characterise different adaptation strategies was explored, using the expertise represented within the Modelling European Agriculture with Climate Change for Food Security (MACSUR) project. In two workshops, modellers identified adaptation strategies, modelling challenges and knowledge gaps. A survey was conducted to understand current

modelling capacity. Challenges centred on knowledge gaps, data availability, technical issues, and stakeholder interaction (e.g. communication with, relevance for). For operational and tactical strategies (changes in practice in response to daily, monthly, or seasonal variation in conditions) most challenges were technical, relating to limitations in the processes and mechanisms represented in models. For longer term strategic climate change adaptation, uncertainty about future socio-economic context (e.g. prices and regulation) and the impact of new adaptation options (e.g. appearance of new technologies) were highlighted. Progressively novel and far-reaching strategies increasingly challenge the scope of existing models. Whilst models vary in capacity, most modellers reported a potential to better characterise adaptation. However, costs (e.g. trade-offs with processing speed) and the fact that adaptation lies beyond the initial remit of many models mean that strategic prioritisation of adaptation as a focus for modelling is key to facilitating model development to support effective stakeholder choices.