Spatial characterisation and modelling of bio-production, eco-systems and climate driven spatial change

Many of the models used to predict the impacts of climate change on bio-production were developed in the 1980s and 1990s and need updating. Such updating will require some form of model intercomparison and recasting of the important elements in models, such that they are 'balanced' in terms of the detail with which they describe biological processes (mainly above- and below-ground). Such model improvement is an identified priority of the Global Crop Modelling Project, to which LIFE contributes via its membership of CRES. In addition, modelling has to take account of the effects of pests and diseases on bio-production, as was done in the EU project 'Karnal Bunt' to which LIFE contributed. A new aspect in the PhD could be how a serious food production threatening disease such as yellow rust might be expected to move (or not) northward and westward under different climate scenarios. Such studies could be linked to the use of stochastic weather generators and their use in impacts assessments. The proposer (JRP) oversaw the development of one of the most used weather generators (LARS-WG) during the early 1990s in the UK. Such techniques would need to be linked to the regional climate predictions that will form a central component of the next IPCC assessment and would contribute to LIFE's engagement with CRES.

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