

Project Progress Summary

Section 1: PROJECT IDENTIFICATION Information to be provided for project identification		NOT CONFIDENTIAL
Title of the project: Development of a model based decision support system to optimise nitrogen use in horticultural crop rotations across Europe		
Acronym of the project: EUROTATE_N		
Type of contract: RTD Shared Cost		Total project cost (in euro) €3,664,759
Contract number QLK5-CT-2002-01100	Duration (in months) 48 Months	EU contribution (in euro) €2,299,080
Commencement date 01/01/2003	Period covered by the progress report (e.g. 1 February 2000 – 31 January 2001) 1 st January 2005 – 31 st December 2005	
<u>PROJECT COORDINATOR</u>		
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Key words (5 maximum - Please include specific keywords that best describe the project.). Nitrogen, fertiliser, model, rotations, economics		
World wide web address (the project's www address) www2.warwick.ac.uk/fac/sci/hri2/research/nitrogenandenvironment/eurotaten/		

List of participants Provide all partners' details including their legal status in the contract i.e., contractor, assistant contractor (to which contractor?).

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Section 2: Project Progress Report

Objectives:

The aim of this project is to develop and evaluate a model-based decision support system to optimise nitrogen use in both conventional and organic field vegetable rotations across Europe. This will help Member States to minimise hazards to the environment by adopting consistent approaches to improved efficiency of nitrogen use for different production systems and climatic regions of Europe and to optimise production of quality crops while enhancing the economic sustainability of horticultural production within the EU.

Results and Milestones:

The project commenced on the 1st January 2003. During the 24 to 36 month reporting period two full participant meetings were in Italy and England. The third project newsletter was published in June 2005. Two out of eight milestones for this period have been met. Work for the other six milestones is well underway and will be completed by the middle of the year. Two out of the five deliverables have been met. Work on the other three will be completed by the middle of the year. Work within the final project year has been rescheduled to accommodate these delays and all major milestones and deliverables will be completed by month 48.

The research is divided into five workpackages, a brief report of progress is described below.

Workpackage 1 involves the compilation and integration of recent theories and knowledge of soil-crop-atmosphere interactions. Some reworking of the irrigation and water sub-modules was required to accommodate treatment of different irrigation regimes. This required the root, water, N uptake and mineralization routines to be modified. This was completed by the end of the year but it did delay the delivery of the model for validation into WP4. The resulting model has considerably greater functionality than the original N_ABLE model from which it was developed. Until the results of the validation are known this workpackage is complete.

Workpackage 2 deals with the evaluation of the effects of varying levels of nitrogen supply on product quality and farm income and the development of an economics module. Firstly considerable work has been carried out to investigate the relationship between total dry-matter yield and marketable yield for a wide range of single and multi harvested crops and algorithms to represent them have been incorporated into the model for validation in WP4. In addition discussions have taken place between the leaders of WP2 and WP5 on the approach to test the management strategies on both economic and environmental performance of horticultural rotations.

Workpackage 3 will amend and develop the existing model to facilitate the improved management of N fertiliser and cropping practices in crop rotations. In order to take account of the more precise treatment of irrigation and water movement, required by WP1 the Java framework has been extended. This has been a lengthy process but does allow for a much better representation of the soil plant interface. This will delay the final release of the model to WP5 which is not now expected until month 44. However work within WP5 is being rescheduled to accommodate this. The final application will be made available to the scientific community as a web application now being built up on an Apple Xserve G5 based at HRI.

Workpackage 4 will assess the new decision support system for fitness of purpose across cropping rotations in Europe. During 2005 all the field experiments required to provide data for model validation were completed and the results summarised in a

report. The data from these experiments is stored in a newly constructed database. A schedule for validation process was drawn up and following the release of the model began. Initial results of the validation indicate that the model is performing the tasks required but many corrections will need to be made.

Workpackage 5 will evaluate agricultural strategies with respect to N losses and economics. We have collected large amounts of information, both on 'model farms' and Good Agricultural Practice during 2004. This information was supplemented in 2005 and a discussion took place on the appropriate case studies to be tested. A document summarizing these was produced. As the model will be delivered late a strategy of parallel working, each participant running its own management scenarios it is hoped that much of this lost time can be made up allowing all the main project deliverables to be delivered within the timescale of the project.

Benefits and Beneficiaries:

The decision support system is intended to benefit growers by allowing rotational planning and optimisation of nitrogen use efficiency, government policy makers on improving Codes of Good Agricultural Practice and key public bodies on developing more effective environmental protection measures

Future Actions (if applicable):

The next reporting period covers months 37 to 48 the final year of the project. The main focus will be to complete the validation of the model. This has been carried out in two stages to allow corrections to be made following the first step and allow a period of retesting before the final version is launched. As the start of validation did not take place until month 35 it is not expected that the final model will be transferred to WP5 until month 44. However the work to test the management strategies in WP5 will now be split between countries to allow benefits of parallel working to overcome the original delays.

We will hold two meetings, the first in Spain in April 2006 and the second in Germany in the Autumn 2006. The website will continue to be updated and the fourth newsletter will be prepared during the autumn/winter of 2006 to publicise the initial findings of the testing of a sample of case studies on the effects of different management strategies on yield, economic and environmental performance of a range of case study rotations, and to publicise the release of the decision support system at the end of the project.