



European Network for the Durable Exploitation of Crop Protection Strategies

IA3 activity: human resource exchange
SA3.2 sub-activity: foster the participation of research teams
from ICPC target countries

ENDURE Grants for ICPC scientists

Final activity report

(The form has to be filled in and sent to the activity leader – message should be sent to his p.a. denise.barreiro@ibaf.cnr.it – within 15 days after the end of the visit)

1. Information about researcher and sending partner

Name and surname: Tetyana Dyman

Professional status: (*PhD student, post-doc, junior or senior scientist*): senior scientist

Sending partner:

Institute/Department/Research Unit: Bila Tserkva National Agrarian University, Ecological Faculty, Department of Ecotrophology

Address: (*street, postal code, city*): pl. Soborna, 8/1, Bila Tserkva, Kiev region, 09117 Ukraine

E-mail and phone number of the researcher: dyman@rambler.ru; +380679757346

Supervisor name*:

Supervisor e-mail*:

Supervisor phone number*:

*Supervisor information only for PhD student, post-doc and junior researchers

2. Information about hosting partner

Hosting partner: Agroscope Reckenholz-Tänikon

Institute/Department/Research Unit: Life Cycle Assessment

Address: (*street, postal code, city*): Reckenholzstrasse 191, CH-8046 Zürich

Supervisor name*: Jeanneret Philippe

Supervisor e-mail*: philippe.jeanneret@art.admin.ch

Supervisor phone number*: +41 44 37 77 228

3. Information about the visit

Duration: (*number of weeks or months*): 3 months

Starting date: 01.04.2010

Ending date: 30.06.2010

4. Description of the activities and outcomes

Background and context: *maximum 10 lines*

As known, pesticides can inflict damage to different components of natural ecosystems: decrease the biological productivity of biocenosis, adversely affect species diversity, decline in a number of beneficial insects and birds. Recently, life cycle assessment (LCA) models are being developed to take into account toxic effect of chemical substances on environment in general and on biodiversity in particular. The problem of pesticide impact assessment on biodiversity is complex, it has not been considered in Ukraine up to now. The **aim** of the project was to further develop the integration of impact of pesticide application into LCA tools focusing in biodiversity and to investigate different scenarios of pesticide application in the Ukraine and use the LCA tool (SALCA-Biodiversity) to assess their effect on biodiversity.

Objective: *maximum 10 lines*

- to study recent developments in terms of Life Cycle Assessment (LCA) methodology, approaches, databases and tools related to the biodiversity protection;
- to collect information about current state of the art and ongoing research on effects of pesticides on biodiversity in agriculture;
- to master methods of indicator measurement/laboratory analysis;
- to investigate different scenarios of pesticide application in the Ukraine and use the LCA tool (SALCA-Biodiversity) to assess their effect on biodiversity;
- to prepare an educational brochure on assessment of pesticide impact on biodiversity for Ukrainian students, agriculture specialist and other interested public groups at local level.

Activities carried out: *maximum 20 lines*

The pesticides applied in arable farming were studied in detail. The recent developments in term of Life Cycle Assessment (LCA) methodology, approaches, databases and tools related to the biodiversity protection were considered. Successful examples of LCA results sharing with agri-food sector stakeholders in Switzerland and their use were studied.

The information about current state of the art and ongoing research on effects of pesticides on biodiversity in agriculture was collected.

The criteria list of pesticide impact assessment on biodiversity for Ukraine taking into account specificities of farming systems, and also cost of indicator measurements was completed.

Methods of indicator measurement in particular sampling and procedure in lab for earthworms (extraction with an expellant solution (diluted allyl isothiocyanate: AITC) and then hand sorting), spiders (suction with a modified vacuum shredder, Stihl SH 86-D, Andreas Stihl AG & Co. KG), wild, domestic and bumble bees (transect walk with aerial netting) were mastered.

Finally different scenarios of pesticide application in the condition of concrete Ukraine farm (wheat fields) were calculated using the method SALCA-Biodiversity.

In order to provide tools, knowledge and expertise gained at the theoretical and practical levels to Ukrainian students and stakeholders who make decisions about the optimisation and reduction of pesticide use, the educational brochure on assessment of pesticide impact on biodiversity was prepared in English and Ukrainian. Brochure contains of such chapters: Preface, Production of pesticides in the world and in the Ukraine, Pesticide impact on biodiversity, Methods for evaluating of pesticide impact on biodiversity, SALCA – method for evaluating the impact of Swiss agricultural practices on biodiversity in life cycle assessments, Calculating of scenarios of pesticide application in the Ukraine using the method SALCA-Biodiversity.

5. Links between visit activity and ENDURE

Describe links and relevance of your visit in relation to a specific ENDURE activity(ies) and sub-activity(ies) – maximum 15 lines

The visit corresponds to ENDURE activities and sub-activities in the following:

1A3. Human resource exchange

RA3. Multicriterion assessment of crop protection methods and cropping systems

RA3.4. Life Cycle Assessment

A Review of biodiversity assessment methods and their relevance in the evaluation of crop protection strategies at field and landscape level is one of the tasks in the Sub-activity RA3.3 which is coordinated by JKI in ENDURE. The assessment involves mainly the method I-Phy and a method developed by SZIE, but also the method SALCA-Biodiversity which is developed by ART. The Method SALCA-Biodiversity has already been tested in Swiss case studies which showed the feasibility and practicability of the model, but up to now the method focus is on agricultural practices and pesticides are only considered globally. A more detailed consideration of pesticides in SALCA-Biodiversity allows extending the LCA results from RA3.4 for the already assessed case studies (wheat, maize, pome-fruit). The adaptation of LCA tool to farming practice for assessment of pesticide impact on biodiversity in other countries can further improve of biodiversity assessment methods.

6. Impact

Added value for the researcher: *maximum 10 lines*

The stay in the Agroscope Reckenholz-Tänikon Research Station ART allowed me:

- to strengthen and empower my knowledge of agricultural science in general, and in a field of Biodiversity Conservation;

- to develop a new improved vision and commitment to assessment of pesticide impact on biodiversity;

- to master new approaches and methods of investigations.

Besides, ENDURE program helped me to improve my teaching techniques, in particular to find latest research results regarding assessment of pesticide impact on biodiversity; to find additional teaching courses for my current curriculum; to acquire practical skill; to improve my command of English for international courses and lectures.

Added value for sending partner and hosting partner: *maximum 10 lines*

This project will enable the researcher (Dr. Dyman) to set up an equivalent research programme on her return to Ukraine. This will provide the Bila Tserkva National Agrarian University to begin the adaptation of LCA tool to farming practice for assessment of pesticide impact on biodiversity in the Ukraine.

The work should also lead to future links and collaboration with Agroskope Reckenholz-Tänikon, Zurich, Switzerland (host institution) and Bila Tserkva National Agrarian University (home institution of the researcher).

Date of submission: 6.07.2010



Dr. Maurizio Sattin
IA3 activity leader

Approved