European Network for the durable exploitation of crop protection strategies

IA3 Activity: *Human resource exchange*

ENDURE - Internal Mobility

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)

Topic of the visit

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1. Information about researcher and sending partner

Name and surname: SOUZI ROUPHAEL

Professional status: PhD student

Sending partner: Scuola Superiore Sant'Anna, Pisa, Italy

Institute/Department/Research Unit: Land Lab

Address: Piazza Martiri della Libertà 33, 56127 Pisa, Italy

E-mail and phone number of the researcher: **s.rouphael@sssup.it** **,** 0039320510711

Supervisor name*: Prof. Paolo Barberi

Supervisor e-mail*: p.barberi@sssup.it

Supervisor phone number*: +39 050 883525

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

2. Information about hosting partner

Hosting partner: University of Lleida

Institute/Department/Research Unit: department of Horticulture, Botany and Gardening

Address: Av. Alc. Rovira Rorure 191, 25198 Lleida, Spain.

Supervisor name*: Dr**.** Paula Westerman

Supervisor e-mail*: westerman@hbj.udl.cat

Supervisor phone number*: +34 973003662

***** For senior scientist indicate the name of the collaborating colleague

3. Information about the visit

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

Starting date: 11/03/2009

Ending date: 14/05/2009

4. Description of the activities and outcomes

Background and context: *maximum 10 lines*

Seed predation is a major strategy that causes significant weed seed losses which could have a greater impact on weed population size than any other life cycle process and should therefore be of significance for natural weed control. Different functional groups of predators are responsible for the seed predation.
Rodents can be considered one of the main seed predators, therefore it interesting to understand their behaviours to enhance their activity and maximise their function.

Objective: *maximum 10 lines*

The distribution patterns of weeds (and their seeds) in arable fields are often patchy meaning that there areas with low and high densities within the same field. Therefore the primary objective of this study is to determine if and how seed predators (rodents in this case) respond to areas (patches) containing high and low seed densities in order to predict if they will be able to regulate weeds in arable fields. The secondary objective is to compare methods of seed predation to estimate the response of seed predators.

Activities carried out: *maximum 20 lines*

- ERWS workshop on weeds and biodiversity in 12 and 13 March 2009.
- The first weeks were dedicated for the experiment planning and material's preparation.
- A 14-day field experiment of seed predation was settled in an irrigated cereal field in Vilanova Bellpuig, Lleida. Four seed densities of *Lolium multiflorum* Lam. and three patch sizes were placed in a complete randomised design to test our hypothesis of rodent's response for different seed densities and patches. Direct soil sampling and seed cards were established to compare the different seed removal methods. Seeds were almost 99% removed on all seed cards after one week of their disposal. Results of the direct sampling method are not yet available.

- A rodent trapping experiment was also established in the same field. For two consecutive days rodents were trapped, controlled and re-trapped ones also were counted weighted and their position was mapped. Mainly rodent species of *Mus spretus* and *Apodemus sylvaticus* were active during this experiment.
- Trials for understanding the behaviour of rodents: some rodents were dipped in a special fluorescent powder, released in the field, at night and under special light, they were followed. While other rodents were tied to a long thread fixed in a certain place and then released in the field. Both trials showed somehow a circular movement of the rodents but they were not really effective beyond a 4 m distance.
- I have also collaborated with some PhD students of the hosting Department helping them in their field and laboratory work.

5. Links between visit activity and ENDURE

My stage was mainly linked to RA 4.5 (Weed Biology and Management) but may have interesting implications for other ENDURE sub-activities. Nowadays there is clear sign that chemicals/based approach to crop protection has reached its limits. An alternative approach is needed one based on the use of ecological principles in order to take full advantage of the benefits of agrobiodiversity and strengthen at the same time the crop protection as well as other services. Therefore many new approaches and new researches are required. Weed control based on the use of herbicides can be replaced by a more sustainable agro-ecological way of control through the seed predation procured by the special functional groups already existing in the agroecosystems.

6. Impact

Added value for the researcher: Acquiring knowledge in seed predation methodology, predator's identification, etc. and having the chance to meet new scientists and researchers.

Added value for sending partner and hosting partner: Helping in their experiments, sharing knowledge and experiences, and strengthening the relationships between both universities in view of joint projects.

Date of submission
14/07/2009

endure
diversifying crop protection

Dr. Maurizio Sattin
IA3 activity leader

Approved