# Crop Protection Department
# Student Learning Assessment Report
### January – May 2007

## *Section I*

### Mission

Contribute to manage harmful and beneficial organisms in agriculture by training professionals in the crop protection disciplines.

Contribute to agricultural development and the conservation of the environment through research, teaching and extension by transferring knowledge related to the management of harmful organism to society.

### Graduating Student Profile (Student Learning Outcomes)

#### ***Skills and Values***

- Oral and written communication skills.
- Critical thinking and problem solving skills through the scientific method to solve phytosanitary problems.
- Team working skills
- Computer literacy
- To evolve as complete professionals with values and ethic principles.
- Apply efficient and effective technologies for the sustainable management of crop pests and other areas of crop protection.
- Leadership and uphold excellent human relationships.
- Professionals with an interdisciplinary vision of phytosanitary problems within a global perspective
- Apply technical knowledge and be a competitive professional.
- Knowledge of the functioning and importance of the environment and its protection.
- Self education.

#### ***Discipline Concepts***

- Understand and apply terms related to crop protection.
- Recognize the factors related to crop disorders and diseases.
- Diagnose the organism or causal agent of crop malfunctioning.
- Identify the taxonomic group of key pests.
- Skills in solving problems caused by plant pathogens, parasites or pests.
- Establish methods for plant disease or damage control.
- Team working skills to solve crop problems.
- Communication skills in spanish and english.
- Know how to use materials and equipment necessary for crop protection.
- Develop broad research and analytical skills related to pest and environmental management.

*Section II*

**Student Learning Assessment Results**

**Sub-Section 1 – Evaluation of knowledge in the Course CROP 5006, Insects of Tropical Crops.**

| Sub-section | Content |
|---|---|
| Focus of Assessment Project | According to the Crop Protection Department Assessment Plan one of the skills that students should develop is critical thinking and problem solving skills through the scientific method for the solution of phytosanitary problems. The evaluated areas were knowledge in the areas of general entomology, taxonomy, integrated management, sampling and terminology in applied entomology of the Course CROP 5006, Insects of Tropical Crops. A test was applied the first day and the last day of classes. The focus were undergraduate fourth year students and graduate first year students of the Crop Protection Department. |
| Justification | The course, Insects of Tropical Crops is an important and essential course to learn about key insect pests of tropical crops for undergraduate students that will graduate and work as agronomists or for graduate students as a basic course for other advanced courses. |
| Measures | To evaluate entomology skills and knowledge in the areas of general entomology, taxonomy, integrated management, sampling and terminology in applied entomology of the Course, CROP 5006, Insects of Tropical Crops, a pretest and a posttest were administered at the beginning and at the end of the course. Data of three semesters was used to have an adequate sample for the statistical analysis, because the course has few students each semester. The analysis was made using a paired t test ($\alpha = 0.025$). |
| Results | The results of the test are presented in the Table 1. There was significant improvement in student knowledge in all the evaluated areas. At the beginning of the course students had less knowledge in the area of insect taxonomy and harmful and beneficial insects. They improved and approved the course with 90.6%. This area is the most focused in the course. Similarly, students had less knowledge in the use of terms related to applied entomology. Students improved but the course didn't prepare them well to obtain an acceptable score in this area. The best scores in the pretest were obtained in the areas of integrated management and general entomology, but student's knowledge in these areas was not enough to approve. At the end of the course, students had the knowledge to approve the two areas. Student's knowledge about sampling techniques was low as demonstrated by a score of 40% in the pretest. They finished the course with enough knowledge in this areas to approve (postest, 82%). |
| Possible | The results show that students improve and acquired knowledge at the end of the |

| | |
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| reasons or hypotheses | course as showed by the t test. A possible reason for the improvement is the efficacy of the teaching strategies and laboratory practices. |
| Course of Action | We will give special attention to emphasize applied entomology terms in the integrated pest management section of the course. |
| Timeline of Proposed Activities | A pre and post test was implemented from January to May 2007. Its effectiveness was evaluated with the use of a paired t test ($\alpha = 0.025$). Data of three semesters was used to have an adequate sample for the statistical analysis,. |
| Appendices | Pre and posttest. |

Table 1. Results of the pre and post test of students of the Course CROP 5006

| Area | Maximum score | μ pretest[1] | μ postest[1] | N | df | Critical t | Calculated T | P ($T \leq t$) $_{0.025}$ |
|---|---|---|---|---|---|---|---|---|
| Total | 52 | 25 (48) | 42 (81) | 25 | 24 | 2.06 | 12.1 | < 0.0001 |
| General Entomology | 10 | 6.2 (62) | 9.5 (95) | 21 | 20 | 2.08 | 4.9 | < 0.0001 |
| Taxonomy | 16 | 6 (37.5) | 14.6 (90.6) | 21 | 20 | 2.08 | 8.5 | < 0.0001 |
| Integrated Management | 8 | 4.9 (61) | 6.5 (81) | 21 | 20 | 2.08 | 3.1 | 0.005 |
| Sampling | 4 | 1.6 (40) | 3.3 (82) | 21 | 20 | 2.08 | 5.2 | < 0.0001 |
| Applied Entomology Terminology | 14 | 4.7 (34) | 8.0 (57) | 21 | 20 | 2.08 | 7.0 | < 0.0001 |

[1]The numbers in parenthesis are the percentages based on the maximum scores in the different areas.

**Sub-Section 2 Training of Crop Protection professors in Assessment techniques:**

| Sub-section | Content |
|---|---|
| Focus of Assessment Project | General improvement of Crop Protection courses content and as a result improvement in skills acquired by students.. The focus were all Crop Protection students.. |
| Justification | Lack of knowledge of professors of Crop Protection about how to implement assessment in their courses and how to evaluate results obtained by the application of different assessment tools. |
| Measures | The efficacy of this assessment activity will be measured in future semesters. |
| Results | No results for the semester of January to May 2007. |
| Possible reasons | Results obtained in future semesters will be analyzed and improvements will be |

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| or hypotheses | implemented. |
| Course of Action | We will analyze results of assessment activities in the capstone courses of the Crop Protection Department, beginning on the semester of August to December 2007 and implement changes to improve the courses. As a result students will improve their knowledge and skills. |
| Timeline of Proposed Activities | From August to December 2007 and January to may 2008. And then in all future semesters. |
| Appendix | Diagnostic test of the course Crop 5006, Insects of Tropical Crops. |

## Appendix: Diagnostic Test for CROP 5006

RECINTO UNIVERSITARIO DE MAYAGÜEZ
DEPARTAMENTO DE PROTECCIÓN DE CULTIVOS
PROC 5006: PRUEBA DIAGNÓSTICA

CONTESTE LAS SIGUIENTES PREGUNTAS:

1. Escriba una composición basada en su conocimiento (morfología, taxonomía, comportamiento, ecología, importancia económica) sobre los insectos. Puede ilustrar sus puntos mediante diagramas o dibujos.

2. En el siguiente cuadro indique cuatro insectos plaga: nombre común, nombre científico, orden y familia taxonómica.

| Nombre común | Nombre científico | Orden | Familia |
|---|---|---|---|
| | | | |
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| | | | |
| | | | |

3. Indique cuatro formas en que usted puede estimar las poblaciones de insectos plaga para recomendar métodos de control de insectos.

   a.

   b.

   c.

   d.

4. Indique cuatro métodos de control de insectos y explíquelos.

   a.

   b.

   c.

d.

5. Defina los siguientes términos:
    a. Umbral económico-
    b. Manejo integrado-
    c. Plaga-
    d. Entomófago-
    e. Plaga directa-
    f. Perforador-chupador-
    g. Metatórax-