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| **Obligatory module or****Selective module** | **Plant Pests Identification (Identifikasi Hama Tanaman)** | **PNH 3140** |
| **Semester** | **V** |
| **Module level** | **Bachelor** |
| **Module Coordinator** | **Dr. Suputa** |
| **Lecturer(s)** | Dr. SuputaDr. Tri Harjaka |
| **Type of Module** | **1 hour and 40 minutes lecture****Practical** |
| **Status** | **C (compulsory courses)** |
| **Exam** | **What are the pests that are dual status as leaf miners and also as tuber borers? Explain and describe how this can happen!** |
| **Number of participants** | **49** |
| **Credit Points:** | **2/1** |
| **Learning outcomes:** After attending this course, students are expected to be able to:a. Understand the science of pest identification well.b. Identifying plant pests well, correctly, and not awkward to collaborate with other competent parties.c. Encouraged to work (make their own identification keys) and grow a sense of respect and work with others.d. Encouraged to be diligent in the process and not merely want something that is instance and grow a soul of high patience.e. Realizing that humans are one of the many creatures of God that exist and humans are part of the food chain in the ecosystem. |
| **Topics covered:**1. Introduction
2. Introduction to the term pest in the field of agriculture
3. Identification of plant pests based on attack symptoms
4. Identification of plant pests based on pest organisms
5. Group discussion assignment
6. Identification of "vegetable" horticultural plant pests based on attack symptoms (group discussion assignment)
7. Identification of "fruit" horticultural plant pests based on attack symptoms (group discussion assignment)
8. Identification of Food Crop Pests based on Attack Symptoms
9. Identification of Food Crop Pests based on Attack Symptoms
10. Identification of Food Crop Pests based on Attack Symptoms
11. Identification of Food Crop Pests based on Attack Symptoms
12. Plant Pest Identification based on Attack Symptoms
13. Plant Pest Identification based on Attack Symptoms
14. Plant Pest Identification based on Attack Symptoms
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| **Contents:**1. Introduction (Implementation of lectures and courses)
2. Introduction to the term pest in the field of agriculture

- Understanding Pests in General (Organism vs. Status)- Plant Protection (Primary Pests, Secondary Pests, Specific Pests)- Plant Quarantine (OPT, OPTP, OPTK, OPTK A1, OPTK A2)1. Identification of plant pests based on attack symptoms

- Signs and Symptoms of Pest Attacks related with pest morphology and behavior- Based on the parts of the plant that are attacked (borer and leaf miner)- Based on the Phases of the Plant Attacked (Example of stem rice Borer)- Based on the attacks caused (Example of bagworm, Grasshopper, and looper; leaf gall)- Based on Attack Signs (Examples of Stem Corn Borer)1. Identification of plant pests based on pest organisms

- Molecular identification (PCR, "Blast Gen Bank" DNA Sequencing)1. Morphology (Description, Pictorial Key, Dichotomous Key, Specimen Museum, Taxonomist)
2. Identification of "vegetable" Horticultural Plant Pests based on Attack Symptoms (Group Discussion Assignment)

**Cabbage (1)**- Crocidolomia Pavonana vs. Plutella xylostella**Cabbage (2)**- Agrotis ipsilon vs Spodoptera litura**Potatoes**- Liriomyza huidobrensis vs. Phthorimaea operculella**Pea / Broccoli**- Chromatomyia horticola vs Liriomyza huidobrensis**Parea**- Bactrocera caramboale vs Atherigona orientalis1. Identification of "fruit" Horticultural Plant Pests based on Attack Symptoms (Group Discussion Assignment)

**Mango**- Rhytidodera simulans vs. Batus rubus vs. Batocera rufomaculata**Air Guava (1)**- Pagodiella hekmeyeri vs. Pteroma plagiophleps**Air Guava (2)**- Megatrioza vitiensis vs. Apoderus javanus**Pamelo orange**- Bactrocera dorsalis vs. Citripestis sagittiferella**Sweet orange**- Borsrocera dorsalis vs. Prays endocarpa1. Identification of Food Crop Pests based on Attack Symptoms in Grain

**Vertebrate*** Rat

**Insect*** To see the difference between Nephotettix virescens and Nilaparvata lugens
* Distinguish the types of stem borer
* Ladybug

**Mollusca*** Golden snail

**White grub*** Holotrichia vs. Leucopholis vs. Phyllopaga
1. Identification of Food Crop Pests based on Attack Symptoms in Secondary crop (Bean)**- Seed magot**

Ophiomyia phaseoli, sin. AgromyzaMelanagromyza sp.* Lomprosema indicata
* Etiella zinckenella
* Riptortus linearis
* Callosobruchus phaseoli vs Bruchus sinensis
1. Identification of Food Crop Pests based on Attack Symptoms in Secondary crop (Corn)
* **Seed magot**

Atherigona exigua vs. Atherigona oryzae* Rhopalosiphum maidis
* Helicoverpa sp. vs. Ostrinia sp.
* **White grub**

Leucopholis, Lepidiota, Uslotria1. Identification of Annual Crop Pests based on Attack Symptoms
* **Sugarcane**

Cane borer (Chillo sacchariphagus vs. Chillo auricilius)Diatraea saccharalis vs. Sesamia inferensCeratovacuna lanigera vs. Saccharicoccus sacchariWhite grub (Lepiodita vs. Anomala vs. Hollothri)* **Tobacco**

Heliothis assulta, Spodoptera lituraLoopwer cutworm (Chrysodeixis calcites)Aphis sp., Bemisia tabacci* **Cotton**

Sundapteryx biguttula vs. Empoasca tabaciHelicoverpa vs. EariasMite1. Identification of Perennial Crops Pests based on Attack Symptoms I
* **Coffee**

Acrocercops zamaenopaXylosandrus vs. XyleborusHypothenemusPlanococcusCoccus viridis* **Cocoa**

The variety of Helopeltis sp.Acrocercops cramerellaPlanococcus* **Oil palm**

To see the different of Setore nitens, Thosea, Darna trima, Ploneta diductaRhinocheros, Oryctes1. Identification of Perennial Crops Pests based on Attack Symptoms II
* **Tea**

Empoasca sp.MiteHelopelthisCydia, Enarmonia, Homona* **Cloves**

Carea angulata* **Chasew**

FruitflyPod borer |
| **Which previous course required?** * General Entomology
* Principles in Plant Pest Sciences
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| **Literature:**Kalshoven, L. 1981. Pest of Crop In Indonesia. PT. Ichtiar Baru-Van Hoeve. Jakarta.Hill, D. 2008. Pest of Crop in Warmer Climate.Bailey, P.T. 2007. Pests of Field Crops and Pastures Identification & Control. Csiro Publishing. Australia.Heinrichs, E.A and A.T. Barrion. 2004. Rice-Feeding Insects and Selected Natural Enemies in West Africa. IRRI, Philliphines. |
| **Material provided:** Power Point, LCD Viewer, Laptop, Downloadable PDF files |
| **Requirements for exam:**Stationery and insect pest specimens |
| **Teaching method(s)** | Student Center Learning |
| Workload (hrs).1. Theoretical of course: 40%
2. Lab work: 40%
3. Home studies: 20%
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