

1. Sampling Technique in Plant Pests And Diseases

Obligatory module or Selective module	Sampling Technique in Plant Pests and Diseases	PNH 3221
Semester	VI	
Module level	Undergraduate	
Module Coordinator	Dr. Tri Joko, S.P., M.Sc.	
Lecturer(s)	Prof. Dr. Ir. FX Wagiman, S.U. Dr. Tri Joko, S.P., M.Sc.	
Type of Module	1 hour and 40 minutes lecture Practical	
Status	E (elective courses)	
Exam	Written	
Number of participants	64	
Credit Points:	2/1 (5.02 ECTS)	
Description:	<p>Subjects of Pest and Plant Disease Observation Techniques are held to achieve core competencies in the form of understanding of various pest and plant disease observation techniques, distribution / distribution of plant diseases and estimating pest populations, methods and techniques for sampling pests and plant diseases, calculating disease parameters (events and severity of disease, AUDPC) and pest population parameters, techniques for handling and sending samples of pests and diseases for identification, techniques for observing pest behavior, and survey and surveillance methods for plant pests and diseases. As an advanced course, student centered learning (SCL) based learning has begun to be applied to this subject to achieve core competencies and others in the form of student courage to actively convey ideas, by way of student discussion and presentation on one of the subjects in the lecture.</p> <p>The lecture design is created to create an interactive learning atmosphere and students can convey their ideas freely and responsibly. To increase student creativity in lectures, in several topics the assignments are given per group (4-5 students) which will be presented in front of the class. Evaluation of student activeness during the discussion is carried out by lecturers and becomes one of the evaluations of learning. In addition to group assignments, to hone students' ability to make scientific reports in writing are also given individual assignments in the form of making papers about research related to one of the subject areas of lectures based on literature study.</p>	
Academic goal (competency):	Introducing basic principles and training in the application of pest and plant disease observation techniques and post-harvest products, surveys and surveillance, introducing approaches for calculating	

	disease parameters (disease incidence and severity, AUDPC) and pest population parameters, to the stages in conducting surveys and surveillance.
<p>Course outcomes:</p> <p>CO1= Able to carry out sampling and observation of plant pests and plant diseases appropriately to support research or the final project.</p> <p>CO2= Able to estimate pest population, distribution and parameters of plant diseases</p> <p>CO3= Able to design surveys and surveillance on pests and plant diseases</p>	
<p>Contents:</p> <ol style="list-style-type: none"> 1. Introduction to lectures and practicum of pest sampling and observation techniques 2. Basic principles for pest sampling and pest observation devices 3. Pest sampling and observation techniques 4. Observation of pest behavior techniques 5. How to estimate pest populations 6. How to estimate damage intensity and yield loss due to pests 7. Survey and pest control 8. Distribution (distribution) of plant diseases 9. Calculation of disease parameters (disease incidence and severity, AUDPC) 10. Observation and diagnosis of plant disease techniques 11. Method of sampling and sending samples of plant diseases 12. Sampling techniques of seed-borne diseases and postharvest products 13. Remote sensing application for observation of plant diseases 14. Survey and surveillance of plant diseases 	
<p>Which previous course required? Plant Protection, Phytopathology, Agricultural Zoology</p>	
<p>Literature:</p> <p>Pest Science:</p> <ol style="list-style-type: none"> 1. McMaugh, T. 2005. Guidelines for surveillance for plant pests in Asia and the Pacific. ACIAR Monograph No. 119, 192p. 2. Dent, D. & Walton, M.P. 1997. Methods in Ecological and Agricultural Entomology. 3. Dent, D. 2000. Insect Pest Mangement 4. Nishida, T. & Torii, T. 1970. A Hand Book of Field Methods for Research on Rice Stem Borer and their Natural Enemies 5. Pedigo, L.P. 1996. Entomology and Pest Management 6. FAO. 2008. Methodologies for sampling of Consignments. International Standards for Phytosanitary Measures (ISPM) No. 31. International Plant Protection Convention. 7. Pusat Karantina Tumbuhan. 2007. Pedoman surveilensi organisme pengganggu tumbuhan (OPT) /OPT karantina(OPTK). Badan Karantina Pertanian, Departemen Pertanian 8. McMaugh, T. 2007. Pedoman surveilensi organism pengganggu tumbuhan di Asia danPasifik. ACIAR Monograph No. 119a, 192p. 9. Pusat Karantina Tumbuhan Dan Keamanan Hayati Nabati. 2011. Pedoman Pengambilan Contoh Produk Tumbuhan untuk Pemeriksaan Kesehatan Media Pembawa OPT/OPTK. Badan Karantina Pertanian 10. Leather, S. R. (ed.). 2005. Insect sampling in forest ecosystems. Blackwell Science Ltd. UK. 	

11. Southwood, T.R.E. and P.A. Henderson. 2000. *Ecological Methods*. Third Edition. Blackwell Science Ltd.
12. McCallum, H. 2000. *Methods in Ecology. Population Parameters: Estimation for Ecological Models*. Blackwell Science Ltd. USA.
13. Pedigo, L. P. dan G. D. Buntin. 2000. *Handbook of sampling methods for arthropods in agriculture*. CRC Press, London.
14. Direktorat Jenderal Tanaman Pangan, Kementerian Pertanian. 2015. Petunjuk teknis pemantauan dan pengamatan serta pelaporan organism pengganggu tumbuhan dan dampak perubahan iklim. Lampiran Keputusan Direktur Jenderal Tanaman Pangan, No. 55/SK.310/C/8/2015, tgl. 24 Agustus 2015.
15. Southwood, T. R. E. 1978. *Ecological methods with particular reference to the study of insect populations*. Chapman & Hall. New York.
16. Kogan, M. and D. C. Herzog (eds.). 1980. *Sampling methods in soybean entomology*. Springer-Verlag. New York.
17. Sandra, S. L. and P. J. Lastimosa (eds.). 1985. *Research techniques in crops*. Book Series No. 35/1985. Philippine Council for Agriculture and Resources Research and Development. Los Banos, Laguna, Philippines.
18. DirektoratJenderal Perkebunan, Direktorat Perlindungan Tanaman Perkebunan. 1982. Petunjuk umum pelaksanaan pengamatan hama dan penyakit perkebunan. Draft Buku I.
19. Jurnal *Ecological Modeling, Economic Entomology, Environmental Entomology*

Plant Pathology:

1. Agrios, G.N. 2005. *Plant Pathology*. 5th Edition, Elsevier Academic Press. 922p.
2. Cook, B.M., Jones, D.G. & Kaye, B. 2006. *The Epidemiology of Plant Diseases*. 2nd Edition, Springer. 576p.
3. Rivai, F. 2006. *Kehilangan Hasil Akibat Penyakit Tanaman*. Cetakankedua. 281p
4. Rivai, F. 2009. *Dimensi Waktu dan Ruang Penyakit Tumbuhan*. 338p.
5. Southwood, T.R.E. 1996. *Ecological Methods*.
6. Zadoks, J.C. & Schein, R.D. 1989. *Epidemiology and Plant Disease Management*. Oxford University Press, 427p.
7. Rusli, E. S., HY. Samudra, N. D. Permana, L. Aini, T. Noerachman, A. S. Hudri, E. S. Hudri, E. Syarifudin, M. Achrom, U. S. Rustiani, R. Desnurvia, Derhani LG, I. Suryaman 2007. *Pedoman teknik pengambilan sampel biji-bijian untuk benih*. Pusat Karantina Tumbuhan. Badan Karantina Pertanian.
8. Badan Karantina Pertanian. 2008. *Pedoman Diagnosis OPTK Golongan Bakteri*. Departemen Pertanian.
9. PusatKarantinaTumbuhan. 2010. *Pedoman Diagnosis OPTK Golongan Nematoda*. Badan Karantina Pertanian. KementerianPertanian.
10. Badan Karantina Pertanian. 2009. *Pedoman Diagnosis OPTK Golongan Virus*. Departemen Pertanian.
11. Pusat Karantina Tumbuhan. 2007. *Pedoman Diagnosis OPTK GolonganCendawan*. Badan Karantina Pertanian.
12. Jurnal *Plant Disease, Phytopathology, Australian Phytopathology, Journal of Indian Phytopathology, European Journal of Plant Pathology, J. of General Plant Pathology*

Materials provided: Power Point Presentation

Requirements for exam:75% attendance

Teaching method(s)	Classes Special assignment related to the subject matters
Workload (hrs). 1. Theoretical of course:14 times 2. Lab work:9 times 3. Home studies:related to the chapter discussed in the class	