1. Weed in Plant Protection

Obligatory module or Selective module	**Weed in Plant Protection**	**PNH 3118**
Semester	V	
Module level	Undergraduate	
Module Coordinator	Prof. Dr. Ir. Susamto Somowiyarjo, M.Sc.	
Lecturer(s)	Prof. Dr. Ir. Susamto Somowiyarjo, M.Sc. Ani Widiastuti, S.P., M.P., Ph.D. Dr. Ir. Nugroho Susetya Putra, M.Si.	
Type of Module	1 hour and 40 minutes lecture Practical	
Status	C (compulsory courses)	
Exam	Written	
Number of participants	64	
Credit Points:	2/1 (5.02 ECTS)	
Description:	Characterization and role of weeds in plant-disturbing organisms (system pathogens & pests, host biological agents, sources of resistance, weeds' influence on microclimates, weeds as a source of pesticides), interactions between weeds and other pests, environmental factors that influence weed development, weed management methods (prevention, technical culture, physical, biological, chemical), biotechnology approaches in managing weeds, optimizing the role of weeds in IPM, integrating Integrated Weed Management (IWM) with integrated pest management (IPM).	
Academic goal (competency):	Students can understand the concept of weeds as a sub-system of plant-disturbing organisms and their status, and are able to integrate weed management in IPM.	

Course outcomes:

CO1 = Students are able to understand the concept of weeds as a sub-system of plant-disturbing organisms

CO2 = Students are able to understand the status of weeds as a disturbing organism

CO3 = Students are able to integrate weed management in IPM.

Contents:

Introduction:

- Explanation of courses: syllabus, weight, lecturer team, lectures, practicum, and evaluation
- Introduction to the science of weeds: the definition, the characteristics of weeds, the benefits of weeds in life, and the basic grouping of weeds.

Weed Ecology:

- Human influence on weed ecology

- Plant-weed ecosystems
- Environmental interaction
- Basic ecological concepts
- Plant competition (definition, influencing factors and degree of competition)

Losses / damage that can be caused by weeds:

- Reduction in yield due to competition in nutrients, water and light
- Increase the cost of controlling pests and diseases
- Reducing the quality or quality of agricultural products and livestock
- Increase production and processing costs
- Hampered water flow in irrigation channels, drainage channels and hydrolytic water pipes (affecting water management)
- Influence human health
- Reducing the quality of land and reducing crops that can be planted
- Affects aesthetic value

Weed reproduction and spread

- Seed production
- Spread of seeds
- Seed dormancy and seedling
- Vegetative propagation

Weed Interaction with OPT

- Weeds as a pest host: viruses, bacteria, phytoplasmas, fungi, nematodes, insects
- Weed as a shelter for biological control agents and other beneficial organisms
- Weed as a vegetable pesticide
- Weed as a source of plant resistance genes
- Weeds affect the microclimate
- Weed has the potential to increase herbicide poisoning in staple crops
- Weed can be a place to live mice, insects, and pathogens

Basics of weed control methods:

- Definition of prevention, control and eradication
- Prevention of weeds
- Mechanical control
- Non-mechanical control
- Control of technical culture

Utilization of biotechnology in weed control

Weed Biological Control:

- Introduction: definitions, benefits, disadvantages
- Application method
- Biological control agency

Allelopathy:

- Allelopathic chemistry
- Production of allelochemicals
- Allelopathy and weed-crop ecology (effects on weed species, weed interference, weed management)

Chemical control

- History of chemical control of weeds
- Benefits of using herbicides

- Negative effects of herbicide use (costs, mammalian poisoning, environmental damage and resistance)

Herbicide Toxicolgi:

- Formulation and application techniques
- How the herbicide works
- Physiology of herbicides in plants

Implementation of IPM concepts in weed management

Examples of weed management in food crops and plantations

Implementation of IPM in horticultural weed management

Which previous course required? Plant Protection

Literature:

Major:

1. Naylor, R.E.L. 2002. Weed Management Handbook (9th Ed.). Blackwell Science, Melbourne, Victoria, 433p.
2. Rana, S.S. &M.C. Rana. 2016. Principles and Practices of Weed Management. Department of Agronomi, Colloge of Agriculture, CSK Himachal Pradesh Krishi, ishavidyalaya, Palumpur, 138p.
3. Somowiyarjo. S. 2019. Gulma Dalam PHT (in preparation)
4. Widyastuti, A., N.S. Putra, & S. Somowiyarjo. 2019. Implementasi PHT dalam Pengelolaan Gulma (in preparation)

Minor:

Tjitrosoepomo, G. 1985. Morfologi Tumbuhan. Gadjah Mada University Press, Yogyakarta, 266p.

Materials provided: PPT ; hand out

Requirements for exam:75% attendance

Teaching method(s)	Classes, discussion, and assignment

Workload (hrs).

1. Theoretical of course:14 times
2. Lab work:7 times
3. Home studies: related to the chapter discussed in the class