



USK
UNIVERSITAS
SYIAH KUALA

FACULTY OF AGRICULTURE
DEPARTMENT OF SOIL SCIENCE

UNDERGRADUATE PROGRAM

MODULE HANDBOOK

Module designation	Local Resources Biopesticides (SSOL6001)
Semester(s) in which the module is taught	5 th Semester
Person responsible for the module	Dr. Ir. Susanna, M.Si.
Language	Indonesian, English
Relation to curriculum	Elective module for Soil Science Department
Teaching methods	Lecture, small group discussion, interactive discussion
Workload (incl. contact hours, self-study hours)	<ul style="list-style-type: none">✓ 100 minutes lecture and discussion per week✓ 120 minutes structured tasks per week✓ 120 minutes learn to be independent per week
Credit points	2 SKS = 3.2 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<ul style="list-style-type: none">✓ Students are able to master the concepts and principles of developing and utilizing locally sourced biopesticides as an environmentally friendly alternative for controlling plant pests and diseases.✓ Students are able to explain the importance of using biopesticides in supporting sustainable agriculture.✓ Students are able to explain simple locally sourced biopesticide products and their effectiveness.
Content	This lecture explains the concept of biopesticides as pest control agents derived from natural sources, including microorganisms, plants, and certain minerals. The development of microbial biopesticides involves exploring microbial sources and plant growth-promoting rhizobacteria (PGPR), followed by isolation, efficacy testing, mass production, formulation, and proper storage to maintain their effectiveness. Similarly, the development of botanical pesticides from plants includes extraction, testing, formulation, and storage, ensuring the preservation of bioactive compounds and their effectiveness against target pests.
Exams and assessment formats	Assignment, Quiz, Midterm exam, Final exam
Study and examination requirements	<ul style="list-style-type: none">✓ Presence: 5%✓ Quiz: 10%✓ Assignment: 25%✓ Midterm exam: 30%✓ Final exam: 30%

Reading list	<ol style="list-style-type: none"> 1. Li, H., Kadzamira, M. A., Ogunmodede, A., Finch, E., Zhu, J., Romney, D., & Luke, B. (2023). Lessons learned and challenges of biopesticide usage for locust management—The case of China. <i>Sustainability</i>, <i>15</i>(7), 6193. 2. Fenibo, E. O., Ijoma, G. N., & Matambo, T. (2022). Biopesticides in sustainable agriculture: Current status and future prospects. <i>New and future development in biopesticide research: Biotechnological exploration</i>, 1-53. 3. Ndolo, D., Njuguna, E., Adetunji, C. O., Harbor, C., Rowe, A., Den Breeyen, A., Hospet, R. (2019). Research and development of biopesticides: Challenges and prospects. <i>Outlooks on Pest Management</i>, <i>30</i>(6), 267-276. 4. Soyel, S. A., Ruidas, S., Roy, P., Mondal, S., Bhattacharyya, S., & Hazra, D. K. (2023). Biopesticides as eco-friendly substitutes to synthetic pesticides: An insight of present status and future prospects with improved bio-effectiveness, self-lives, and climate resilience. <i>International Journal</i>, <i>2</i>(2). 5. Oguh, C. E., Okpaka, C. O., Ubani, C. S., Okekeaji, U., Joseph, P. S., & Amadi, E. U. (2019). Natural pesticides (biopesticides) and uses in pest management-a critical review. <i>Asian Journal of Biotechnology and Genetic Engineering</i>, <i>2</i>(3), 1-18. 6. Dadang, Pr ijono D. 2008. <i>Insektisida Nabati Pr insip Pemanfaatan dan Pengembangan</i>. Bogor (ID): Departemen Proteksi Tanaman, IPB. 7. Hagler JR. 2000. Biological control of Insect Using cultural practices to Enhance Insect Pest Control by Natural Enemies. Di dalam: Rechcigl JE, dan Rechcigl NA, editor . <i>Management: Techniques for Enviromental Protection</i>. Michigan (US): CRC Lewis Publisher
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