

SKILL DEVELOPMENT COURSE
VERMITECHNOLOGY
AND SOLID WASTE MANAGEMENT



Course Code-M2&M4ZOO-SE-01 A

NO OF CREDIT-2

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ADMISSION PROCEDURE

Eligibility : 10+2 with minimum of 50% marks

Seats : Minimum 10 Maximum 20

Fee : 2500/- per semester

Reservation : As per University rule

INTRODUCTION

Sustainable development is the successful management of resources to satisfy the changing human needs ,maintaining and enhancing the quality of environment and conserving natural resources at the same time.The ultimate aim of sustainable development is to conserve natural resources and human health in long term.

The research on earthworms has gained a lot of priority in India as well as in other countries .Charles Darwin's observation on earthworms is a milestone in understanding the soil biology and an enormous contribution to some aspects of the genesis of humus and of its role in soils. Earthworms are perhaps the best known of all soil inhabiting animals commonly called “friends of farmers” due to the beneficial role that they play in soil. Vermicomposting is the process of decomposition of organic matter in which the mutual actions of earthworms and micro-organisms are used to convert the organic waste into vermicompost, a rich soil fertilizer. Almost any agricultural, urban or industrial organic material can be used for vermicomposting providing that it does not contain any toxic material that can harm the earthworms.

Organic waste poses a serious environmental problem globally. This can be solved by combination of effective technologies like Biodung composting and Vermitech (incorporating earthworms for the production of vermicompost

Due to increasing urbanisation, industrial growth and high cost related to waste treatment facilities, solid waste management is done in an unsustainable manner, mainly in developing countries. This leads to serious environmental problems in terms of air, ground/surface water pollution and contribution to global warming in the absence of the leachate and gas collection systems in landfills.

Vermicomposting technology provides a sustainable and low input basis to overcome these problems through the management of organic fraction of solid waste streams.

OBJECTIVES-

To get an approach of ecofriendly solid waste management

To produce high nutritional vermicompost for soil health improvement

To produce vermiwash for scientific crop production

To introduce indigenous varieties of Rajasthan in vermicomposting

To generate self employment by producing verms, compost and vermiwash.

To educate educational institutes to use their waste and produce compost for the use of their gardens.

Eligibility for the Course

Candidates for admission to Certificate course in Vermiculture could possess a minimum of Higher Secondary school Education in Science subjects with Biology .

Duration of the Course -

One year Certificate course in Vermiculture course non-semester for One Year duration

SYLLABUS

PART I: BIOLOGY OF EARTHWORMS

UNIT I - Morphology & Anatomy:

Earthworms Taxonomic position ,external features- shape , size,colour,segmentation,setae&clitellum.Bodywacoelom,locomotion,digestive ,excretory & nervous system.

UNIT II - Biology

Reproductive system-Male & Female, copulation, cocoon formation & fertilization, development of earth worm.

UNIT III - Habitat Ecology:

Burrowers, casts, nocturnal, poikilothermal, ecological grouping – Epigeic species, Endogeic species and Anecics.

UNIT IV - Diversity of species:

Detailed study of Lumbricus terrestris, Eisenia eugenia,Eudrilus Eugenia, Amynthas gracilus, Perionyx excavates.

UNIT V - Economic importance of Earthworms:

In sustainable agriculture, organic farming, earthworm activities, soil fertility & texture, soil aeration, water impercolation, decomposition & moisture, bait & food.

PART II: VERMITECHNOLOGY AND SOLID WASTE MANAGEMENT

UNIT – I

Vermitechnology- Definition, history, growth and development in other countries & India, significance.

UNIT – II

Vermiculture – definition, scope and importance; common species for culture; Environmental parameters; culture methods – wormery – breeding techniques; indoor and out door cultures - monoculture and polyculture – merits and demerits.

UNIT – III

Vermicomposting of wastes in field pits, ground heaps, tank method, roof shed method, static pile windrows, top fed windrows, wedges & bin method, harvesting the compost, storage, Vermiwash-Preparation and application.

UNIT – IV

Applications of vermiculture – Vermiculture Bio-technology, vermicomposting, use of vermicastings in organic farming/horticulture, earthworms for management of municipal/selected biomedical solid wastes; as feed/bait for capture/culture fisheries; forest regeneration.

UNIT – V

Future perspectives – Predator / pathogen control in wormeries; Potentials and constraints for vermiculture in India. Marketing the products of vermiculture – quality control, market research, marketing techniques – creating the demand by awareness and demonstration, advertisements, packaging and transport, direct marketing. Visit to relevant Labs/Field Visits

PRACTICALS

Based on above topics

1. Procurement of Worms (Exotic and Inegenous)
2. Procurement of cowdung and different waste collections
3. Decomposition of waste materials
4. Formation of composting pits
5. Preparation of vermibeds
6. Harvesting of worms and compost
7. Chemical analysis of Compost and comparison of FYM and chemical fertilizers
8. Small scale demonstration of compost and vermiwash on any two vegetable grown locally
9. Helping the trainee to get self employment by contacting various agencies

SUGGESTED READING

1. Sultan Ahmed Ismail, 2005. The Earthworm Book, Second Revised Edition. Other India Press, Goa, India.
2. Bhatnagar & Patla,2007. Earthworm vermiculture and vermin-composting, Kalyani Publishers,New Delhi
3. Mary Violet Christy,2008. Vermitechnology,MJP Publishers, Chennai.
4. Aravind Kumar, 2005.Verms & Vermitechnology, A.P.H. Publishing Corporation, New Delhi.
5. Sultan Ahmed Ismail, 2005. The Earthworm Book, Second Revised Edition. Other India Press, Goa, India.
6. Bhatnagar & Patla,2007. Earthworm vermiculture and vermin-composting, Kalyani Publishers, New Delhi.
7. Jordan & Verma,2009. Invertebrate Zoology , Chand & Company Ltd.

- 8 Edwards, C.A & P.J Bohlen, 1996. Biology and ecology of earthworms
III Edn. Chapman & Hall N.Y.U.S.A.
- 9 Lee, K.E. 1985. Earthworms their ecology and relationships