Training Course on Advanced Weed Science and Herbicide Resistance Management

Professional Development Training Course Outline

Category	Agriculture	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Training Course on Advanced Weed Science and Herbicide Resistance Management is designed to address the urgent need for innovative and science-based solutions to weed control in modern agriculture. With increasing cases of herbicide resistance, declining efficacy of traditional weed control measures, and mounting environmental concerns, it is critical to equip agronomists, researchers, farm managers, and policy makers with the latest knowledge and practical strategies in weed science. This course focuses on advanced weed biology, herbicide resistance mechanisms, integrated weed management (IWM), and emerging biotechnological interventions.

This comprehensive program will strengthen participants' capacity to analyze, design, and implement sustainable weed management systems that improve crop productivity and reduce resistance build-up. Through hands-on case studies, interactive modules, and expert-led instruction, the course ensures alignment with current agricultural innovations, climate-smart practices, sustainable land management, and precision farming technologies, making it an essential learning path in today’s agricultural landscape.

Programme Curriculum

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Course Objectives

1. Understand the biology and ecology of weeds in various agroecosystems.
2. Identify major herbicide-resistant weed species and their characteristics.
3. Analyze mechanisms of herbicide resistance and resistance evolution.
4. Apply integrated weed management (IWM) principles in field settings.
5. Evaluate the environmental and economic impacts of weed infestations.
6. Develop herbicide rotation strategies to minimize resistance development.
7. Implement weed mapping and digital surveillance tools.
8. Understand regulatory frameworks and herbicide stewardship programs.
9. Examine the role of biotechnology in weed and resistance management.
10. Promote climate-resilient weed control strategies.
11. Use data analytics and AI for precision herbicide application.
12. Address soil health and its role in sustainable weed suppression.
13. Build effective extension and outreach strategies for farmer adoption.

Target Audiences

1. Agricultural Extension Officers
2. Agronomists and Crop Scientists
3. Farm Managers and Commercial Farmers
4. Agrochemical Industry Professionals
5. Environmental Scientists
6. Agricultural Policy Makers
7. University Students and Researchers
8. NGOs working in Sustainable Agriculture

Course Duration: 5 days

Course Modules

Module 1: Weed Biology and Ecology

- Introduction to weed science
- Weed-crop interactions
- Seed dormancy and dispersal mechanisms
- Invasive weed species
- Weed identification and classification
- **Case Study:** Impact of *Striga hermonthica* on cereal yields in sub-Saharan Africa

Module 2: Herbicide Resistance: Mechanisms and Trends

- Types of herbicide resistance
- Genetic and biochemical mechanisms
- Resistance evolution modeling
- Resistance detection techniques
- Resistance risk assessment
- **Case Study:** Glyphosate-resistant *Amaranthus palmeri* in US cotton farms

Module 3: Integrated Weed Management (IWM)

- Cultural weed control techniques
- Mechanical and physical controls
- Biological weed suppression
- Chemical control within IWM
- Cover cropping and crop rotation
- **Case Study:** Adoption of IWM in Australian grain farming systems

Module 4: Herbicide Rotation and Stewardship

- Herbicide classification and modes of action
- Resistance prevention through herbicide rotation
- Herbicide tank mixing and synergy
- Application timing and techniques
- Regulatory and stewardship programs
- **Case Study:** Stewardship success in Brazil's soybean production

Module 5: Digital Tools and Weed Surveillance

- Weed mapping using drones and satellites
- Mobile apps for field scouting
- Geo-tagging weed outbreaks
- Real-time data collection and dashboards
- AI and machine learning in weed prediction
- **Case Study:** AI-powered weed detection in Kenyan maize fields

Module 6: Environmental and Economic Impacts

- Herbicide runoff and water contamination
- Non-target species impact
- Cost-benefit analysis of weed control methods
- Externalities of resistance buildup
- Long-term sustainability considerations
- **Case Study:** Economic losses due to herbicide misuse in India

Module 7: Biotechnological Approaches

- Genetic engineering for herbicide tolerance
- Gene editing for weed control
- Bio-herbicides: types and applications
- Regulatory and safety considerations
- Ethical and consumer perspectives
- **Case Study:** Use of HT crops in North America and their weed resistance dynamics

Module 8: Outreach, Policy & Capacity Building

- Designing farmer-centered extension programs
- Communication tools for rural engagement
- Policy formulation and advocacy
- Monitoring and evaluation strategies
- Partnerships with government and private sector
- **Case Study:** National weed resistance action plan in South Africa

Training Methodology

- Interactive lectures and expert presentations

- Hands-on field demonstrations and lab sessions
- Group discussions and problem-solving workshops
- Case study analysis and simulation exercises
- Access to e-learning resources and digital toolkits
- Final project presentations and feedback sessions

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com