

## **Environmental & Sustainable Farming**

### *Programme Module Aims*

Equip the learner with the relevant knowledge, skills and competence to farm in an environmentally friendly and sustainable manner in compliance with relevant EU and national legislation.

### *Programme Module Requirements*

None

### *FETAC Component to which the programme will lead*

Level 6 Component Certificate in Environmental and Sustainable Farming.

### *Learning outcomes: On completion of this module, the learner should be able to:*

1. Describe the effects of farming on water, air, soil.
2. Prepare a Farm Nutrient Plan.
3. Describe farm wildlife habits and biodiversity – range, protection and enhancement.
4. Outline the key requirements for cross compliance.
5. Outline best practice for farm building planning, waste management and recycling.
6. Describe key requirements for sustainable farming.
7. Outline policies and strategies to reduce greenhouse gases.
8. Evaluate energy and resource usage, efficiency and conservation principles for a given farm situation.

### *Syllabus Content*

1. The Effects of Farming on Water, Air, Soil
  - 1.1 Why water quality is important for farmers (surface water, ground water)
  - 1.2 Water Framework Directive, Nitrates Directive – implications for Irish farmers
  - 1.3 Water quality risk areas, nutrients leaching/runoff, chemicals farm yard pollution
  - 1.4 Nitrogen, Phosphorous – pathways of loss, effects on the environment, recommendations and codes of practice
  - 1.5 Teagasc Agri Catchment Programme
  - 1.6 Water conservation (water charges, grants/aids, water foot-printing)
  - 1.7 Air Quality – odours, production of ammonia
  - 1.8 Impact of farming practices, systems and machinery on soil
  - 1.9 Good soil management practices
2. Preparing a Farm Nutrient Management Plan
  - 2.1 Composition and nutrient value of organic manures and soiled water
  - 2.2 Calculation of the quantities of organic manures and nutrients produced on a farm
  - 2.3 Calculation of the quantities of soiled water and washings produced on a farm

- 2.4 Calculation of the storage requirements for organic manures/slurry, soiled water and washings for a farm
  - 2.5 Calculation of the nutrient demand for a farm
  - 2.6 Soil Fertility and Nutrient Status
  - 2.7 Preparation of a Nutrient Management Plan for a farm
  - 2.8 Assessment of potential environmental risks and farm pollution for a farm
  - 2.9 Set up a fertiliser spreader or slurry spreader to comply with a nutrient management plan
  - 2.10 Strategies to maximise nutrient use
  - 2.11 Dry Matter Content in slurry
  - 2.12 Measure Dry Matter of slurry using a slurry hydrometer and estimate nutrient content
3. Farming and Wildlife Habitats and Bio-diversity
    - 3.1 Bio-diversity in Ireland – Irish flora and fauna
    - 3.2 Range of farm wildlife habitats (e.g. arable land, grassland, peatland, woodland, scrub, hedgerows, field margins)
    - 3.3 Designated Habitats – NHA's, SAC's, SPA's
    - 3.4 Measures to protect and enhance farm biodiversity and wildlife habitats
    - 3.5 The importance of hedgerows to the Irish countryside
    - 3.6 Hedgerow management – selection, establishment, maintenance, rejuvenation
    - 3.7 Field margin establishment
    - 3.8 Bio-diversity auditing for a farm
4. Cross Compliance Requirements
    - 4.1 What *is* Cross Compliance
    - 4.2 SMR's (Statutory Management Requirements)
    - 4.3 GAEC (Good Agricultural and Environmental Practice)
    - 4.4 Nitrates Directive and Nitrate Derogations
    - 4.5 Cross Compliance Inspections
    - 4.6 Key Issues for Cross Compliance Inspections (e.g. Animal Identification, Nitrate Directive, Pesticides, Dairy Hygiene, Animal Remedies, encroachment, other compliance issues)
    - 4.7 Bio-diversity cross compliances
    - 4.8 Sustainable Use Directive SMR9
    - 4.9 Heritage
5. Planning Permission, Waste Management, Recycling at Farm Level
    - 5.1 Planning Permission Requirements and Key Steps
    - 5.2 Practical measures to minimise impact of Farm Buildings on the environment
    - 5.3 Waste Management and Litter Legislation – Implications for farms
    - 5.4 Waste Disposal and Recycling options for farms
6. Sustainable Farming and Environmental Protection Schemes, Biotechnologies
    - 6.1 Components of Sustainable Farming (Water, Air, Soil, Climate)
    - 6.2 EU Directives and EU and national policies to promote sustainable farming
    - 6.3 Agri-Environmental Schemes (REPS, AEOS, Burren, Farming Conservation Programme)
    - 6.4 Impact of Agri-Environmental schemes (farmer participation, benefits to the environment and farmers)
    - 6.5 Future Agri-Environmental Policy Trends – Common Agricultural Policy reform
    - 6.6 Biotechnology – an emerging issue, challenges and opportunities for sustainable farming, consumer and world trade issues, EU policy
    - 6.7 Example biotechnologies: Genetically modified crops, genetically modified animal feed, use of biotechnology in animal breeding and health
7. Farming and Climate Change
    - 7.1 Greenhouse Gases and Climate Change
    - 7.2 Greenhouse Gas Emissions and Farming (Methane, Nitrous Oxide, Carbon Dioxide)
    - 7.3 Climate Change Policy – Kyoto and Gothenburg Protocols, IPCC, Targets for Ireland

- 7.4 Practical measures to reduce greenhouse gas emissions on Irish Farms
- 7.5 Carbon Credits, Carbon sinks, Carbon Trading
- 7.6 Carbon Footprint concept – relevance to farming and food marketing, The Carbon Trust
- 7.7 Carbon footprints for Irish farm production systems
- 7.8 Calculating a carbon footprint for a given situation

8. Evaluation of Energy and Resource Usage, Efficiency and Conservation on Farms

- 8.1 Evaluation of electric power usage on a farm – lighting, heating and equipment, equipment cooling, electric motor powered equipment, other electrical
- 8.2 Electricity rates, unit cost, night rate, electricity provider rates
- 8.3 Tractor fuel consumption rates – impact of engine horsepower, task being carried out
- 8.4 Practical measures to reduce farm electricity costs
- 8.5 Farm Vehicle running costs
- 8.6 Practical measures to reduce fuel costs at farm level
- 8.7 Alternative and Renewable Energy Sources for Farms: wind energy, bio energy options, anaerobic digesters, solar power, air source heat pumps
- 8.8 Energy Conservation Measures and Grant Aid for Farms/Farm Dwellings
- 8.9 Water usage
- 8.10 Strategies for sustainable farming – input reduction (energy, fertilisers, pesticides, cultural practices)

*Teaching and learning methodologies*

Classroom presentations  
 Farm visits  
 Practical sessions  
 Workshops  
 Discussion Groups  
 Assessments

*Assessment Methods*

**Written Examination**

**40%**

Two Examinations (Unseen papers), each of 1 hour duration

Paper 1 (20%) Answer two questions from three Sections (1,3,4)

Paper 2 (20%) Answer two questions from three sections (5, 6, 7) and from section 8 if taking option B on assignment 2.

**Assignments**

**60%**

**Assignment 1** (Section 2) (i) – (v) 20% written (vi) 10% practical

Prepare a Nutrient Management Plan for a given farm over one year to comply with the Nitrates Directive

|       |  |                    |
|-------|--|--------------------|
| (i)   | Calculation of Nutrient Production   | (Written)<br>20%   |
| (ii)  | Storage capacity and storage deficit/surplus   |                    |
| (iii) | Calculation of nutrient demand   |                    |
| (iv)  | Fertilising recommendations and plans for nutrient application, managements<br>Of and plans for storage of manures/slurries and soiled water |                    |
| (v)   | Assessment of environmental risk and recommendations to avoid Farm pollution   |                    |
| (vi)  | Measure dry matter content in slurry to estimate nutrient content  | (Practical)<br>10% |

**Assignment 2**

Carry out an environmental resource audit on a given farm (30%)

Record fuel and electricity consumption for a duration of 3 months

Identify current tools and methods to quantify and reduce Green House Gases

Identify high energy use practices

Identify least environmental sustainable practices

Recommendations and strategies to ensure sustainable farming (on the given farm)

Note: No marks may be allocated to this assignment until all components of the assignment have been completed and submitted

**Penalties for late submission of coursework without a valid reason:**

Please refer to Teagasc late submission policy

Grade: Unsuccessful 0-46%, Pass 50-64%, Merit 65-79%, Distinction 80-100%