

TABLE OF CONTENTS

Part I

FERTILIZERS AND ANIMAL WASTES

FOREWORD.....	10
SUMMARY AND CONCLUSIONS.....	11
Chapter 1. OVERVIEW OF THE SITUATION.....	18
1. Introduction.....	18
2. Reasons for Concern.....	19
3. Problems already facing Member Countries.....	19
4. The Scope of this Report.....	20
Chapter 2. NITRATE LEACHING FROM AREAS OF INTENSIVE CROP PRODUCTION -- THE ROLE OF SYNTHETIC FERTILIZERS.....	22
1. Summary of the Nitrogen Cycle in the Soil.....	22
2. The Nitrogen Cycle in Crop Production.....	25
3. Trends in Crop Production Affecting Nitrate Leaching.....	30
Chapter 3. NITRATE AND PHOSPHORUS POLLUTION BY ANIMAL WASTE.....	40
1. Development and Location of Intensive Animal Production....	40
2. The Causes of Water Pollution.....	41
3. Pollution Processes.....	42
4. Pollutant Types.....	43
5. Factors Discouraging better use of Manure and Slurry.....	44
Chapter 4. POLLUTION OF THE WATER RESOURCE SYSTEM: PROBLEMS EXPERIENCED INCLUDING HEALTH ISSUES.....	47
1. Transport of Nitrate and Phosphorus Compounds to Water.....	47
2. Other Sources of Nitrate and Phosphorus Compounds.....	48
3. Natural Denitrification in Water Resources.....	49
4. Nitrate in Drinking Water : Health Considerations .....	49
5. High Nitrate Ingestion by Farm Animals.....	55
6. Eutrophication of Surface Water.....	55

Chapter 5. PREVENTIVE MEASURES TO REDUCE NITRATE POLLUTION WITHIN AGRICULTURAL THE SECTOR.....	57
1. Practical Measures for Reducing Nitrate Leaching from the Intensive Use of Synthetic Fertilizers.....	57
2. Practical Measures for Reducing Pollution from Animal Wastes.....	60
Chapter 6. WATER MANAGEMENT MEASURES TO MINIMISE THE IMPACT OF NITRATE POLLUTION ON DRINKING WATER.....	64
1. Basic Considerations.....	64
2. Short-term Management Measures Available to Water Suppliers .....	65
3. Medium- and Long-term Options.....	70
Chapter 7. POLICY DEVELOPMENT -- GUIDING PRINCIPLES AND AVAILABLE INSTRUMENTS.....	73
1. Introduction.....	73
2. The Main Elements of a Policy.....	73
3. Environmental and Agricultural Viewpoints.....	74
4. Basic Principles for Policy Evaluation.....	77
5. Policy Measures available for Pollution Prevention.....	81
Chapter 8. RESEARCH NEEDS.....	87
Annex 1. NATIONAL EXAMPLES OF THE NITRATE PROBLEM.....	89
Annex 2. DENSITIES OF LIVESTOCK AND NUTRIENT CONTENT OF ANIMAL WASTE.....	106

## Part 2

### PESTICIDES

FOREWORD.....	110
SUMMARY AND CONCLUSIONS.....	111
Chapter 1. OCCURRENCE OF PESTICIDES IN THE AQUATIC ENVIRONMENT.....	118
1. Origin of Pesticide Contamination.....	119
2. Summary of Pathways of Pesticides into the Aquatic Environment.....	121
3. Impact of Pesticides on the Water Environment.....	122

Chapter 2. POTENTIAL PROBLEMS IN CURRENT USE PATTERNS.....	126
1. Synergism.....	126
2. Metabolisation and Degradation.....	126
3. Impurities in Commercial Preparations.....	127
Chapter 3. PESTICIDE REGULATION.....	128
1. Registration and Licensing Schemes.....	128
2. Regulatory Action at the Post-Registratio/Licensing Stage.....	129
3. Monitoring Pesticide Use and Effects.....	129
Chapter 4. PESTICIDE PRODUCTION AND USE.....	132
1. Production of Pesticides.....	132
2. Use of Pesticides.....	133
Chapter 5. POSSIBLE FUTURE DEVELOPMENTS IN THE FIELD OF PESTICIDES.....	137
Chapter 6. RESEARCH NEEDS.....	140
Annex 1. REGISTRATION/LICENSING SCHEMES.....	142
Statutory vs Non-Statutory.....	142
Data Requirements.....	142
Notes and References.....	144