



# SUSTAINABLE AGRICULTURE

## What is it all about?

*Integrated farming is the most efficient way to a productive, environmentally friendly and socially responsible agriculture in the EU*

## RELIABLE, PLENTIFUL AND HIGH QUALITY SUPPLY

Thanks to the daily efforts of highly productive farmers, using the best available technology, Europeans have access to a huge variety of high quality, affordable food products. Such food quality and availability has never been known before. However, the global challenges arising from climate change, dwindling natural resources such as soil and water, and the need to preserve nature and biodiversity, mean that we are still far from a secure food supply for the planet's population of more than seven billion. The task will only get more difficult as the population will rise to more than nine billion by mid-century.

These challenges can only be met when the world's farmers are able to farm productively and sustainably. Sustainable agriculture is based on the efficient and productive use of soil, water, energy, nutrients, and labour. At the same time, it minimises negative environmental effects (for example effects due to fertilizer losses or release of greenhouse gases when soil is unnecessarily disturbed), whilst conserving biodiversity. Last but not least, sustainable agriculture achieves social responsibility and trust through transparent communication. It fulfils the needs of people, planet and purse.





*High quality food at affordable prices – and the choice is yours!*

## INTEGRATED FARMING: Innovative, Practical and Effective

In the EU, science and technological progress have the potential to form the basis of a sustainable agriculture and food chain. Innovation has improved all aspects of farming: plant and animal breeding, soil science, plant nutrition and plant protection, agricultural engineering, animal nutrition and welfare, and veterinary medicine. Innovation also underpins the concept of Integrated Farming, which aims at minimising environmental impact and maintaining a secure supply of high quality food while, at the same time, assuring farmers' livelihoods.

Over the centuries, farmers have learned to use natural resources efficiently, conserving them to ensure sustainability. In modern times, they have been greatly helped by scientific research and innovation, sound professional education and high quality advisory services. They are well informed about the best crop management methods, how to manage livestock efficiently with high welfare standards, and effective ways to manage their land and natural resources.

However sustainable agriculture as practised through Integrated Farming means much more than just applying the right amount of fertilizers, feeding animals properly or keeping crops healthy. Integrated Farming is based on a holistic (whole farm) approach, on science-based management and on the optimal blend of experience and innovation in a continuous pattern of "planning, evaluation, and improved management."

Therefore, being aware of how Integrated Farming works is essential not just to make sustainable agriculture a practical reality, but also to increase consumer acceptance and trust through improving understanding of the realities of farming. With this brief summary and description of Integrated Farming, the European Initiative for Sustainable Development in Agriculture (EISA) hopes to contribute to this understanding. Many different issues need to be considered in everyday farming practice; this brochure covers some of the key points but is not exhaustive.



*Integrated Farming – the holistic (whole farm) approach for sustainable development in agriculture.*

# INTEGRATED PRODUCTION: Key Factors

## Arable Farming

### — *Integrated Soil Management*

Good soil husbandry ensures long-term fertility while reducing the risk of erosion, compaction and associated environmental concerns. At the same time, it helps to increase yield and profitability. An improved knowledge of farm soils by means of soil mapping helps in planning suitable cultivation, crop rotations and specific soil conservation measures such as reduced tillage, winter stubbles and green cover crops (intercropping).



*With the help of GPS and displays in the tractor cab, fertilizers are applied according to demand, and “on the spot” without overlapping.*

### — *Integrated Crop Nutrition*

Knowledge of the soil nutrient status is essential to ensure that optimum amounts of particular fertilizers are applied. The decision making process takes account of specific crop demands, the existing soil status, and nutrients derived from farm manure and crop residues. Providing the right type and amount of nutrients, with appropriate timing, for specific crops is an important tool to assure healthy, high quality crops while protecting the environment.

#### **Key practices of integrated soil management:**

- Soil management plan, to be evaluated and revised annually
- Long term crop rotation plan, soil cover index (time and percentage of soil covered by plants)
- Soil management advice and technical recommendations
- Soil quality monitoring including soil organic matter, regular assessment of field conditions
- Choice and record of soil operations including measures to prevent compaction

#### **Key elements of integrated crop nutrition:**

- Crop nutrient management plan (including organic nutrient supply), to be revised annually
- Advice and technical recommendations
- Calculation of Nitrogen needs and efficient Nitrogen use
- Phosphate and Potassium balance as well as micronutrient supply
- Consideration of soil pH status (liming according to soil demand)
- Records of nutrient applications
- Operator training and calibration of spreading equipment

### — *Integrated Crop Protection*

Crop protection measures must be warranted. Effective crop protection using the Integrated Pest Management (IPM) approach is based on four steps: prevention, observation, informed decision making, and intervention. The selection of more resistant varieties, combined with balanced crop rotations, helps

to minimise the need for crop protection measures. Chemical crop protection is used as much as is needed but as little as possible. Biological methods should be used whenever they are available, ensure satisfactory pest control, and are cost-effective.



*Information about pest pressure is vital for all crop protection measures.*



*If satisfactory pest control cannot be achieved otherwise, targeted chemical crop protection is applied following the rule “as much as necessary, as little as possible”.*

### Key elements of Integrated Pest Management (IPM):

- Crop protection management plan, to be revised based on experience
- Good skills in the identification of pests, weeds, diseases, and crop disorders
- Use of the complete IPM “tool box” for crop protection including cultivation, non-chemical and chemical options
- Protection and encouragement of important species, beneficial organisms and biodiversity
- Willingness to learn and improve systems; training; use of advice and recommendations
- Proper decision making process (using threshold values, monitoring, warning systems)
- Strategy to avoid developing resistance to herbicides, fungicides, and insecticides
- Choice of optimum crop protection product, rate and timing, following label instructions
- Minimisation of all impacts on water, soil, air, and biodiversity
- No application outside cropped area (i.e. on field margins, hedges, river banks, etc.)



*Beneficial organisms help “keep the balance”.*



*Filling and cleaning of the sprayer in the field or on a “bio-bed” help to avoid point source pollution.*



*Colorado Beetle – one major potato pest.*



## — *Integrated Animal Husbandry, Health and Welfare*

All management practices should aim at meeting the welfare needs of the animals, maintaining livestock in good health, in comfortable, low stress conditions, and allowing for natural behaviour to the greatest possible extent. Balanced, nutritious feed is essential. Compliance with disease prevention plans / statutory health controls, and documentation of all treatments is also part of integrated practice. Traceability by origin, age, race and category of livestock, together with individual batches of animal feed (whether produced on site or purchased elsewhere) is ensured by compliance with national identification systems.

### **Key elements of integrated animal husbandry, health and welfare:**

- Welfare of animals ensured by fulfilling their physiological needs, satisfying their food requirements, and maintaining them in good health
- Adequate housing, space, ventilation, stocking density, comfort, grouping and transport
- Feed purchase records and quality assurance
- Regular evaluation and improvement; continuous provision of information and training
- Disease prevention and treatment including responsible use of medicine for animals



*Health and welfare of farm animals are prerequisites for high-quality produce.*

# THE ENVIRONMENT: Key Factors

## Water Use and Protection

Protecting ground and surface water resources, and using water wisely, are key elements of Integrated Farm Management systems for maintaining and enhancing the environment, wildlife and biodiversity. Using water responsibly means using and re-using it as efficiently as possible.



*The protection of water also helps to maintain biodiversity.*

### Key elements of water use and protection in Integrated Farming:

- Water management plan, to be revised annually
- Water output control (metering) and water use records
- Monitoring and maintenance of drainage systems, ditches and watercourses on farm
- Irrigation on the basis of appropriate forecasting and with the right technical equipment
- Prevention of leakage, run-off control, separate collection of rain water where possible
- Proper storage and use of fertilizers, crop protection products, diesel fuel and oil, etc.

## Climate Change and Air Quality

With regard to climate change, integrated management decisions can help to maintain carbon stores in soils by allocating land to annual or perennial crops, grassland, woods or uncultivated buffer zones. Some practices, such as reduced tillage, use of cover crops or incorporation of crop residues into the soil, may increase carbon sequestration and help to improve air quality.

### Key elements of reducing emissions in Integrated Farming:

- Management concept to avoid emissions, to be revised annually
- Fuel efficiency of equipment and practices, reduction of transport distances where possible
- Emissions from livestock manure (in housing, from storage, spreading and incorporation into the soil)
- Methane emissions from ruminants (having a strong climatic effect)
- Gaseous Nitrogen emissions ( $\text{NH}_3$ - and  $\text{N}_2\text{O}$ ) in fields after fertilization
- Increase of carbon sink function in arable farming



*Not all soils are suitable for reduced tillage or direct drilling. Where direct drilling is possible, however, this helps to keep carbon stores in the soil and save fuel.*

## Energy Efficiency

Awareness of sustainability issues and responsible management of natural resources are central to Integrated Farming. Careful use of inputs, conservation tillage, reducing fossil fuel needs where possible, and striving for optimum instead of maximum yields all help to increase the input-output ratio and hence energy efficiency.

### Key elements of energy efficiency in Integrated Farming:

- Whole farm management plan for energy use, to be revised annually
- Records of energy inputs in arable farming and livestock keeping
- Recycling and re-use of products which need high energy input
- Energy production from liquid manure and biomass, two-crop system where possible
- Use of renewable energy, in particular fuels
- Technical recommendations and advice



*Besides using energy efficiently, there are more and more opportunities to produce renewable energy on farms.*

## Landscape and Nature Conservation

Protecting and enhancing wildlife and biodiversity is of great importance within the holistic concept of Integrated Farming. Management practices should consider biodiversity effects such as the threat to skylarks from cultivations and / or mechanical weeding. Maintaining and enhancing a wide range of land uses and landscape features helps encourage a diverse collection of wild plants and animals.

### Key elements of landscape and nature conservation in Integrated Farming:

- Whole farm conservation plan, to be revised annually
- Leaving a certain area of land (field margins, hedges, etc.) unused for cropping
- Active involvement of staff and contractors
- Consider nesting birds / wildlife during field operations / forage cutting (grass, etc.)
- Small areas of wildlife seed mixes, beetle banks and comparable strips / structures
- Monitoring and protection of wildlife
- Advice and exchange with local nature conservation representatives



*Leaving some of the farm land without crops improves habitats and hence living conditions for wildlife.*



*Butterflies – equally beautiful and important elements of ecosystems.*

## INTEGRATED FARMING DELIVERS

When looking at farming from the “inside”, there is a need for constant incremental improvement, often resulting in major benefits for the business and the environment. Therefore, being aware of technological developments and new scientific findings is important. New ideas, procedures or strategies may lead to considerable improvements when implemented.

When looking at farming from the “outside”, i.e. from a consumer’s point of view, it is important to

keep in mind that agricultural systems are highly integrated and single practices cannot be changed without evaluating the consequences for the whole business. If, for example, cultivation is changed from deep ploughing to reduced tillage, this will inevitably affect crop rotations, fertilisation, and crop protection needs. Therefore, consumers need to understand that best practice cannot be prescribed but needs to be chosen and adapted according to the situation and circumstances of individual farms.



*The public is invited to “get in touch” with agriculture and see where their food is produced.*

## ABOUT EISA

The European Initiative for Sustainable Development in Agriculture (EISA) was founded with the common aim of developing and promoting Integrated Farming throughout Europe. Integrated Farming is a sustainable system, which helps farmers improve the way they farm for the benefit of the environment, the profitability of their business and social responsibility, including all important aspects of sustainable development.

EISA members also help create a better public understanding of agriculture through a network of demonstration farms. EISA brings farmers and consumers together to raise awareness of how farmers are working in harmony with nature to produce high-quality, safe food and renewable resources with environmental and social care.

EISA works in partnership with all stakeholders to achieve shared responsibility and decision making for collective action, as well as to promote the benefits and principles of Integrated Farming. Integrated Farming provides a framework to manage priorities. Attention to detail ensures the balance is achieved to create win-win situations. As an organisation, EISA works closely with the EU institutions and other stakeholders to contribute to the development of agricultural and environmental policies in the EU.



*Full members: national associations from six countries (Austria, France, Germany, Luxembourg, Sweden and United Kingdom).*



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