

Integrated Farming Topic Sheet no 2/2014

Crop Protection through Integrated Pest Management (IPM): Requirements and Opportunities



What Is IPM and what does it involve?

Integrated Pest Management (IPM) is the careful consideration of all available plant protection methods and subsequent integration of appropriate measures that discourage the development of populations of harmful organisms and keep the use of plant protection products and other forms of intervention to levels that are economically and ecologically justified and reduce or minimise risks to human health and the environment (*Sustainable Use Directive, SUD, 2009*). IPM is one important element of the holistic Integrated Farming approach as defined in the EISA Framework¹, and offers a toolbox of techniques that can be tailored to different cropping systems, climatic conditions, pest pressures and availability of solutions. The SUD identifies 8 general principles of IPM:

1. Achieving prevention and / or suppression of harmful organisms
2. Monitoring and observation of harmful organisms
3. Decision-taking on the need of plant protection measures made based on monitoring results and thresholds where feasible
4. Intervention involving physical, non-chemical methods and chemical methods (pesticides) individually or in combination. Non-chemical methods should be preferred if they provide satisfactory pest control
5. Pesticide selection
6. Keeping the use of pesticides and other forms of intervention to the necessary levels
7. Apply anti-resistance strategies
8. Evaluation of the success of the applied measures

IPM provides multiple benefits and can play a significant role in making farming more environmentally, economically and socially sustainable. Through practicing a range of techniques, producers can ensure the profitability and quality of their crops while protecting biodiversity and looking after the environment, reduce potential problems of pest resistance and increase consumer confidence in the quality of the produce. IPM is a systems based approach where the entire systems effect is greater than the individual components. In addition, the diversity of solutions available in IPM helps ensure the long term sustainability of control measures.

In order to gain a full holistic understanding of the benefits of IPM a sound understanding of the interactions between soil, water, air and plants under the unique climatic and cropping conditions of the individual farms is required. Additionally, strategies used need to be within the context of sustainable production, addressing economic viability, environmental responsibility and social acceptability. Together, this means that ensuring widespread uptake of IPM has its challenges.

European regulations

Since the 1st January 2014, the Sustainable Use Directive (SUD) requires Integrated Pest Management techniques to be adopted by farmers throughout Europe. The Directive 2009/128/EC establishes a framework to achieve sustainable use of pesticides and promotes the use of IPM.

¹ <http://sustainable-agriculture.org/integrated-farming/>

MORRISTON FARM

IPM techniques are applicable in all farming enterprises and are currently practiced to varying degrees across the UK and Europe. At Morriston Farm in Ayrshire, UK, for example grass margins are encouraged to aid pest control.

Morriston Farm is a 650ha LEAF Demonstration Farm in Scotland. This arable farm mainly grows forage crops for neighbouring livestock farms. Strip tillage is used throughout the farm and wide grass margins are planted with wild bird seed or maintained in long term grass/wildflower mixes to increase biodiversity and for game for the estate.



Since the development of the margins, a reduced requirement for insecticides has been noticed as the margins are a haven for insects which can help with pest control. For example, ladybird populations are relied upon to control aphid populations. The ladybirds help prevent pest outbreaks and keep aphids below the threshold at which they begin to cause economic damage. Similarly other insects such as ground beetles encourage birds which help keep slug population low.

Current activities and support available

Integrated Pest Management is a core component of Integrated Farming. For farmers, effective crop protection using the IPM approach is based on four steps: prevention, monitoring/observation, informed decision making and intervention. The selection of more resistant varieties, combined with balanced crop rotations, help to minimise the need for crop protection measures. Biological methods should be used whenever they are available, ensure satisfactory pest control, and are cost effective. Chemical crop protection is used as much as is needed but as little as possible.

The EISA Framework² and LEAF Sustainable Farming Review³ provide a useful decision based framework to support farmers in adopting Integrated Farming and IPM measures as well as consider other options that might be available. As IFM and IPM develop we will continue to communicating practical realistic and achievable solutions, while working with others to seek new innovation and technologies to improve farm productivity, environmental enhancement and social acceptability.

The main avenue for successful communication in this area is via demonstration farms and applied on-farm research. To this end, EISA has a network of Demonstration Farms across its national members' countries, which are able to share their experiences, expertise and thoughts on how IPM works in practice within their farming business. On-farm events are great opportunities to exchange ideas and discuss new practices in an informal but structured setting.

² <http://sustainable-agriculture.org/integrated-farming/>

³ <http://www.leafuk.org/leaf/farmers.eb>

IPM, viticulture and arboriculture

IPM techniques are widely used in viticulture and arboriculture throughout Europe, for instance in FARRE demonstration farms (France). Video documentaries have been produced to explain what IPM means for FARRE farmers⁴ and to see on-farm IPM practices in France⁵.

For instance, the Benoits' farm, in the North-East of France, grows 13 ha of fruit (apple, pear, apricot and peach). Mr Benoit says IPM is an approach that needs to be built step by step. Various techniques and practices are combined to help reduce environmental impacts whilst maintaining the economic potential.



The orchard is grassed, which enables the fruit grower not to use herbicide treatments in between the rows. Instead of a full mowing, every other row is mown: this provides beneficial insects with a permanent shelter. To help fight nematodes, strips of tagetes are sown around the orchard.

To help manage the development of diseases such as apple scab, prophylactic methods are used and the decision of treatment is built with several tools such as observation of outbreaks and thresholds, and computer models. Natural products which are part of biocontrol techniques, such as laminarin, can also be of significant help in the prevention of diseases such as apple scab, oidium and conservation diseases. They are called natural defense stimulators.

Biocontrol techniques are also widely used to help control insect pests. For instance, mating disruption, a sex-pheromone interference system, allows to drastically reduce the number of insecticide treatments against the codling moth. Pheromones can also be used to help follow the populations of insect pests and to know when to set up the system of mating disruption. Additionally, the farmer also uses the granulosis virus, which is a natural product that helps controlling codling moth populations.



Such practices help reducing the number and impact of traditional treatments in the orchards, as well as relying strongly upon the observation and a complex decision-making process dealt with by the farmer himself.

Where Next?

Through LEAF, EISA are involved in a project currently underway across Europe called PURE⁶ with the aim of creating an IPM toolbox where farmers can pick and choose techniques that work together and will work for them.

Research into IPM continues to grow with the full breadth of IPM techniques being constantly pushed and investigated to their full boundaries. Much of this is still at an academic level but will soon be tested in the field and with increased interest new and improved techniques and pest control strategies will soon be evident on farm. EISA and LEAF work to help build the link from scientific progression that is made to farmers on the ground, for example through LEAF Innovation Centres.

⁴ <https://www.youtube.com/watch?v=xAlxPWbhpqQ&list=UUxxNfYcqAMHW3zMqX5qlaag&index=14>

⁵ <https://www.youtube.com/watch?v=NY-HPaCLYtA&feature=youtu.be>

⁶ <http://www.pure-ipm.eu/project>