Pest control and plant protection in grasslands

Goal	Sustainable grassland management regarding pest populations and weed control
Short description of the measure	The presence of plant species regarded as unproductive or undesired – frequently designated as weeds – is usually reduced through mechanical or chemical methods (herbicides). Reseeding is also used when a jagged sod is the reason for the spreading of undesired plant species. Both mechanical and chemical approaches may have negative impacts on biodiversity (Figure 1). Manual or mechanical approaches should be the priority. However, different approaches may be considered, depending on the region. In Central and Northern Europe, reducing the presence of weeds using mechanical measures has fewer negative effects on the environment compared to the use of herbicides. In Southern Europe, avoiding tillage and preserving the existing soil organic matter is necessary and frequently complemented with localized and precise use of agrochemicals (with lower persistence due to less tillage) (Basch et al., 2015).

Figure 1 – The application of herbicides may have negative impacts both on biodiversity and human health. Photo credits: © pixabay.com

Integrated Pest Management (IPM) is a cornerstone of the European Union's Directive on the sustainable use of pesticides (2009/128/EC) (EU, 2009). All available information, tools and methods must be considered so that the healthy development of crops is attained with the least possible disruption of agro-ecosystems and using natural pest control approaches, if possible. This way, IPM aims at keeping the use of pesticides and other associated approaches within the levels that are economically and ecologically justified, reducing or minimising health and environmental risks. Whenever sustainable, biological and physical (non-chemical) methods provide satisfactory pest control, they should be chosen.

The application of IPM includes measures such as:

a) crop rotation;
b) the adequate use of cultivation techniques;
c) the reasonable use of resistant/tolerant cultivars and standard/certified seed and planting material;
d) the use of balanced fertilisation, liming and irrigation/drainage practices;

e) the adoption of hygiene measures (such as the regular cleansing of machinery and equipment) in order to prevent the spreading of harmful organisms;
f) the protection and enhancement of important beneficial organisms (using plant protection measures or ecological infrastructures inside and outside production sites) (Figure 2).

The use of mechanical weeding is recommended in order to substitute pre-emergence herbicides. Pesticides which are dangerous to pollinating insects, such as bees, and other beneficial organisms must never be used.

Figure 2 – Ecological infrastructures, such as hedges, may allow for beneficial organisms, such as birds that prey on insect pests, to be present in the farm. Photo credits: © pixabay.com

Quality elements of soundly implemented biodiversity measures

- In the absence of measures resorting to chemicals or in the presence of exclusively highly precise amounts of specific herbicides and pesticides, in precise locations, high levels of biodiversity are observed in the farm (including pollinating insects and other beneficial organisms);
- The nests of early breeding birds, such as the wood lark (*Lullula arborea*) are kept safe;
- Buffer zones of at least 10 meters or higher (if the Member State requires so) next to the water bodies, have been respected;
- Hygiene measures are employed;
- The presence of harmful organisms is frequently monitored;
- The success of the applied plant protection measures is frequently monitored.

Effects on biodiversity

(ecosystems, species, soil biodiversity)

- Clean and healthy water bodies allowing for richer and more stable trophic webs of plant and animal communities;
- Higher Soil Organic Matter (SOM) allowing for richer soil and insect biodiversity;
- Trophic webs based on the floral diversity that is present and is not prejudicial (even if not part of the crops) are present and stable.

Other positive effects/benefits for the farmer	▪ Significant increase in human health of the local population and farm workers; ▪ Reduced risk of diseases usually facilitated when individuals are exposed to chemicals (herbicides or pesticides); ▪ Higher SOM and therefore higher crop and pasture growth, yield and quality (palatability, digestibility and nitrogen content); ▪ Reduced impact on trophic webs; ▪ Prevention of diffuse pollution.
Indicator/key data	▪ SOM measured in the soil; ▪ Soil biodiversity; ▪ Flora and fauna observed in local ecological structures and water bodies; ▪ Available reports regarding the monitoring of harmful organisms and the application of plant protection measures.
References	▪ Basch, G., Friedrich, T., Kassam, A., Gonzalez-Sanchez, E., 2015. Conservation Agriculture in Europe, in: Farooq, M., Kadambot, H.S. (Eds.), Conservation Agriculture. Springer International Publishing, Basel, Switzerland, pp. 357–390. ▪ EU, 2009. Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides. Off. J. Eur. Union L 309, 71–96.

Further information: Knowledge Pool

This Action Fact Sheet belongs to the training package for product and quality managers of companies and was developed within the project LIFE Food & Biodiversity (Biodiversity in Standards and Labels of for the Food Industry). The main objective of the project is to improve the biodiversity performance of standards and sourcing requirements in the food industry by helping standard organisations to integrate efficient biodiversity criteria into their schemes and motivating food processing companies and retailers to include comprehensive biodiversity criteria into their sourcing guidelines.

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