

PLANT PROTECTION



HOW EU BEET GROWERS OPTIMISE THE USE OF INTEGRATED PEST MANAGEMENT (IPM) TO PROTECT CROP AND CONTRIBUTE TO ENVIRONMENTAL SUSTAINABILITY

Protecting the sugar beet crop is essential to achieving both optimum quality and yield, to ensure optimum land use and GHG emissions, farmers' incomes, secure raw materials for factories and provide quality products to consumers.

Combining various strategies, techniques and tools, including Plant Protection Products (PPPs), is crucial for sugar beet growing. Without appropriate protection against weeds, pests, and diseases, there is a high risk of substantial yield losses and even crop failure.

Integrated Pest Management (IPM) refers to the management and combination of a range of crop protection techniques, from crop rotation to IT decision support tools and mechanical weeding, with the aim to achieve efficiency in the use of inputs while respecting the environment.

SEED TREATMENT

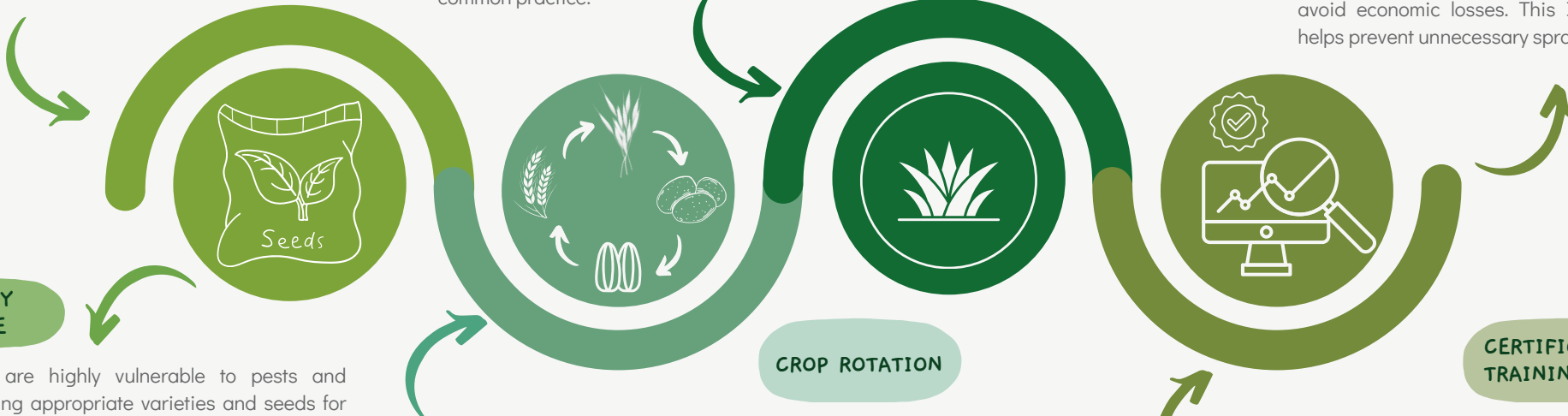
Beet seeds can be treated with very low doses of appropriate fungicide and/or insecticide during the process of seed pelleting in the controlled environment of beet seed processing plants. To reduce overall PPP usage, seed treatment is a good practice in case of systematic infestation when treatment thresholds are inevitably reached.

WEED CONTROL

Sugar beet seedlings are very sensitive to weed competition (for nutrients, light, water and space), especially within 8 weeks of crop emergence. This can cause large yield losses, by 11% or more by one single tall weed per square metre. Severe weed infestations can reduce yields by up to 90% in untreated fields. It is essential to control weeds before crop establishment (prior to beet sowing, before and after emergence of weeds). Throughout much of the crop cycle, targeted weed control advice is provided, based on continuous monitoring of the growth stage of the beet crop, the most common weeds and their growth stages, and the soil and weather conditions before and after spraying. Mechanical and chemical combined weeding as well as use of robotics is becoming common practice.

PEST AND DISEASE MONITORING AND CONTROL

Weekly controls are conducted on monitoring sites between April and September. When an infestation level surpasses a certain threshold, growers in affected areas receive a notification with instructions to check their fields. If the observed infestation exceeds the control thresholds, immediate treatment with chemical PPP and (if available) biocontrol is necessary to avoid economic losses. This IPM monitoring helps prevent unnecessary spraying.



VARIETY CHOICE

Young beet are highly vulnerable to pests and diseases. Using appropriate varieties and seeds for the existing conditions can help farmers minimise the need for chemical protection. In the EU, all sugar beet varieties are resistant to at least one major disease, with the number of double or triple tolerance varieties increasing.

CROP ROTATION

Crop rotation naturally prevents the build-up of host-specific pests and pathogens causing diseases, mainly Rhizoctonia root rot and the leaf diseases Cercospora leaf spot and powdery mildew. Waiting longer between planting the same crop in the same field can reduce pest populations.

CERTIFICATION TRAINING

Training and certification are mandatory for sugar beet growers and workers to ensure proper handling of PPPs, minimising risks to humans and the environment (including dosage, equipment usage, application timing, storage, and disposal).

GOOD PRACTICES & EVOLUTION OF INDICATORS ACROSS THE EUROPEAN TERRITORY

The sugar beet sector is working to optimise the use of crop protection tools and the use of chemical PPPs to reduce negative impacts. Inputs such as fertilizers and PPPs require significant energy to produce. This means they contain 'embodied carbon'. Our sector is actively working to reduce its carbon footprint through various techniques:

CROP ROTATION



European growers sow sugar beet in a given field on average every 3 to 7 years. Crops in rotation with sugar beet include mostly wheat, barley, potatoes, onions, maize, oilseed rape. Other crops also grown, although to a lesser extent, include grass, flax, green beans, peas, carrot, leeks, yellow mustard, beans and various other vegetables.

IPM IN PRACTICE



Unitip is Cosun Beet Company's cultivation registration and advice programme that gives Dutch growers reports to quickly view crop, balance and sustainability data. These reports show how the grower's crops are performing in comparison to other beet growers in his/her area and/or the Netherlands.



In Sweden, with same or less inputs (e.g. fertilizer, PPPs, labour) growers now produce higher yields (higher use efficiency). It represents approximately +200 kg sugar/hectare/year over the last 25 years.



In France, insecticide seed treatment for decades allowed reduced PPP use after sowing. However, the recent withdrawal of certain PPP active substances, in particular neonicotinoids in seed treatments, means that insecticides are triggered earlier in the vegetation cycle, as seed treatments no longer protect the crop as long. Neonicotinoids ban can lead to further increases in PPP aphicides.

In a farm in northern France, the DEPHY network project showed that by adopting numerous IPM practices the level of herbicides can be reduced by around 30% under certain conditions.

BIODIVERSITY



In 2018, German farmers cultivated around 117,057 hectares of flowering area. This corresponds to a five metre wide flower strip 234,114 kilometers long. In 2019, it reached 150 000 ha.



In 2017, 25% of French sugar beet fields were partially surrounded by biodiversity infrastructure such as catch crops, flowers strips or grass.



In 2022, the Tienen refinery in Belgium offered seed to around twenty beet growers to plant 25,000 m² of flower strips. This is far from an isolated initiative.

TOLERANT/ RESISTANT VARIETIES



In the Netherlands, all beet varieties on offer in the EU are rhizomania resistant, and there is an increasing number of double resistant (rhizomana plus rhizoctonia, nematodes or cercospora) varieties. Such double-tolerant varieties continue to increase their share of area sown to a level (>85%) that single-tolerant varieties never reached. Triple-tolerant varieties maintain 10% share of acreage.

MONITORING TOOLS / DIGITAL DECISION-SUPPORT TOOLS



The French Technical Institute for Beet (ITB) provides a monitoring interactive map indicating the treatment thresholds to control the aphids that carry yellows virus and foliar diseases. The map is based on observations made by the ITB and its partners in the sector and became part of Vigicultures®.

DIAGBET is another tool that identify diseases, parasites, pests and beneficials. It provides all the information needed to identify and manage them.



In the Netherlands, growers have warning systems and damage thresholds for aphids (vectors of virus yellows), for other insects such as beet fly, and for foliar diseases such as cercospora.

WEED CONTROL & MECHANICAL WEEDING



Out of 500 farmers surveyed, 60% of respondents had carried out mechanical weeding in 2022 on 80% of their beet acreage. The dry weather conditions in the spring of 2022 have encouraged mechanical weeding, but its effectiveness remains dependent on a good combination of chemical and mechanical weed control. Difficulties remain, such as the extra time needed for localised weed control and the increasingly high cost of equipment.

THE FUTURE OF CROP PROTECTION:

Innovative, alternative & combined strategies, tools and approaches:

- New adapted beet varieties (tolerant /resistant varieties)
- Effective low-risk PPPs and biocontrol solutions
- Agronomic practices - "mutually beneficial" - (flower strips, companion plants, etc.)
- New innovative agronomic practices (complex combination of agronomy & ecology, reduction of field size, etc.)

New digital age: innovation in precision farming and digital tools:

- Improved monitoring
- Seeding and weeding robots
- Mechanical weeding
- Precision spraying