Crop specific guidance – Sugar beet

The IPM Tool allows you to prioritise pests that are important on your farm. This helps guide decisions on which IPM measures are appropriate. Implementing IPM can result in 'trade-offs' where methods to control one pest may increase another. Some of these trade-offs are included in the notes below and in the Tool. Prioritising pests will help decide which pests are most important where there are trade-offs. This guidance documents provides advice on IPM measures for sugar beet insect pests and diseases. For information on IPM interventions for weeds, refer to the separate IPM Weeds guidance document.

Insect Pests

Insect pests in sugar beet cause damage to the crop either through direct feeding or through the transmission of viruses during feeding. Insect pest control has been highly dependent on using seed treatments and applications of insecticides, but reductions in available chemistry and increasing resistance issues have increased the need to make use of integrated management for control of insect pests.

Few of the non-chemical methods are likely to be 100% effective in arable crops. However, they do reduce the requirement for chemical control. Combinations of one or more techniques are likely to be most effective. Also, in some instances the presence of some insect damage will not necessarily impact on yield.

Select low risk locations / Avoid following long-term grass leys

Populations of some pests can build up under long-term leys, such as wireworms. These will potentially feed on any crop following a grass ley. Cereals or maize in rotation with sugar beet can also increase the risk of wireworm.

Soil analysis for pests

Essential for planning control of BCN. It will establish the level of BCN infestation and can give an indication of soil populations. Typically, there is an economic benefit associated with using BCN-tolerant varieties when soil analysis shows above two eggs and larvae per gram of soil.

Field History, Rotation & Break crops

If a field has a history of BCN, it is likely that this will return as a problem in the future, through survival in the soil. Knowledge of field history allows steps to be taken to minimise the risks.

In field non-cropped areas / Beetle banks / Diverse crop margins or strips

Beetle banks consist of stands of wildflowers and grasses and are designed to act as reservoirs of beneficial insects such as ground beetles and parasitoids, which help to provide natural biological control of pests.

Diverse crop margins and strips act in a similar way to beetle banks to increase natural enemies. However, some of the plant species could benefit pests. More diverse strips should harbour greater

biodiversity and greater numbers of beneficials. Ladybirds, hoverflies and lacewings are natural enemies of aphids in sugar beet.

Seed Rates

Increasing seed rates can compensate for the loss of plants to pests.

Hygiene and Prevention

Sugar beet spoil heaps can provide shelter and food for pests such as aphids. Allowing sugar beet volunteers to persist can also create a 'green bridge' which allows aphids to colonise newly established sugar beet crops and spread virus yellows.

Variety choice

Varieties are now available that claim to have tolerance to virus yellows. There are also varieties available that show tolerance to BCN which means they yield well in the presence of BCN but also allow BCN reproduction.

Decision Support Tools (including thresholds)

For the control of aphids transmitting virus yellows, IPM decisions should be made based on the results of monitoring and forecasting combined with threshold information where available. Treatment thresholds are the population level or density that must be reached before intervention is required or economically beneficial. Thresholds enable growers to make decisions based on the level at which pests will impact economic crop yield. They are essential in guiding pest control decisions and preventing the unnecessary use of pesticides. Links are provided to appropriate decision support tools in the IPM Tool.

Planning pest management strategy

Planning the optimum non-chemical strategy for managing each pest can help to avoid 'fire engine' use of pesticides. Previous records of pest damage are very useful to help predict the likely timing of pest attack. Records should also be kept of the success of non-chemical pest control strategies.

Decision Support / Monitoring techniques

Pest monitoring is an essential component of integrated pest management. This can involve visual inspection of the crop or some sort of trapping system (e.g. water traps, sticky traps, or pheromone traps). Pest numbers are related to thresholds and decisions on the need for treatment.

Monitoring and forecasting of pest populations can ensure timely control interventions. Monitoring of pests can be defined into three main principles: observation, weather, and correct identification.

Observation includes regular crop walking, noting populations of insects, weeds, or disease severity, recording crop damage and numbers of beneficial species seen. Using traps can help monitor insect populations.

Weather is one of the main influences for pest development. Monitoring recent and forecasted weather can help predict the impact that pests may have on the crops and prepare for timely control measures.

Correct *identification* of pests can help prevent early outbreaks and is important for deciding on effective control measures. The use of pest ID information (see links in the tool) traps, local warnings, and professional advice from qualified agronomists can all help.

Diseases

Diseases impact on sugar beet mainly through reducing green leaf area and photosynthesises, and later disease outbreaks during root development which can reduce yield and the resulting quality of the harvested sugar beet.

Field History, Rotation & Break crops

If a field has a history of a certain disease it is likely that this will return as a problem in the future, either through survival in the soil, on the soil surface or on a green bridge host plant as a disease or as an alternative host for a virus vector. Knowledge of this field history allows steps to be taken to minimise the risks. Crop rotation limits the build-up of many soil borne sugar beet diseases, it also allows an opportunity to control beet volunteers which can act as a reservoir of disease. Sugar beet should be grown 1 year in every 4 as a minimum.

Select low risk locations

The strain of *Rhizoctonia solani*, which is responsible for rhizoctonia root rot in sugar beet, has a relatively broad range of hosts including oilseed rape, broccoli, cabbage, cauliflower, peas, beans, radish, wheat, barley, potatoes and many weed species. Fields with a previous history this disease in these host crops should be avoided for planting sugar beet.

Hygiene and prevention

This is the first defence against the introduction of soil-borne diseases into clean land for example rhizomania. Machinery used in infested fields should be power-washed before use in uninfected fields, and soil should at least be knocked off from boots and tools. Clean fields should be visited first in the sequence of crops so that cleaning down equipment can be done at the end of the day.

Sugar beet spoil heaps can host many diseases such as rhizoctonia, violet root rot and others glyphosate should be used to achieve a zero tolerance of shoot or foliage production.

Variety Choice / Resistant varieties

Resistant varieties are a key part of non-chemical disease control. There are good sources of information on disease resistance to many of the major pathogens in the recommended list of sugar beet varieties published by BBRO. This information is updated annually.

Decision Support tools

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