Tyfu Cymru: Technical Advice Sheet
Ornamental Plant Protection

Cultural Control – Prevention is Better Than Cure

Effective pest and disease control should always begin with cultural controls, and you should plan all your crop management activities on site with pest and disease control in mind. A **Dry Regime** can be a strong foundation, and can help to limit the impacts of foliar diseases such as Botrytis alongside root diseases like *Pythium* and *Phytophthora*. In planning your activities to keep the crop as dry as possible you could consider the following:

- Minimise periods of leaf wetness – planning irrigation for the early morning rather than the late afternoon to help the crop dry out. This can be particularly useful to help prevent foliar diseases such as downy mildew in susceptible crops like Hebe.
- When irrigating less frequently in the winter match irrigation with weather forecasts and apply on bright, sunny days.
- In protected crops maximise ventilation to aid leaf drying and blow through to help disperse humid, stale air. Keep vents and doors open as much as possible unless there is a risk of frost. On days where there is a frost risk open these as soon as temperatures rise above a damaging level to disperse humid air.
- A range of fans are available for use in tunnels, and suppliers can provide advice on placement to avoid pockets of dead air. Consider systems that include humidistats that will switch on if humidity gets above a set threshold.
- Anti-condensation products like Anticondens are available for use on the inner surface of tunnels or glass to prevent and disperse condensation to prevent drips falling onto the crop – be careful with their use as there are similar but different products for different surfaces e.g. glass and polythene.
- Make sure irrigation tanks are covered to limit evaporation, but this will also stop leaves and other sources of disease blowing into water tanks. Covers also prevent leaves and algae from accumulating in the tank.

Weed Control can also be an important approach, both from controlling humidity within crops as well as removing reservoirs of pest and disease problems. You should aim to prevent weeds from setting seed to limit escalation. Weekly hand weeding on a careful rotation has proven to be more labour effective than a heavy handed sporadic approach and is a lot more likely to prevent weeds establishing.

Bioprotectants

Bioprotectants (formerly known as biopesticides) are separate from biological controls such as insect predators that you may release into your crop. These are typically microbial agents that are sprayed onto the leaf surface and act to combat plant pathogens by outcompeting or inhibiting their growth, such as feeding on leaf exudates. This means they must be carefully applied to the crop in advance of any problems in such a way that they can become established over the canopy.

These are generally applied as a spray onto the foliage with conventional chemical spray equipment. However, it is best to have a separate dedicated sprayer for bioprotectants as it can be difficult to fully clean out chemical tanks to prevent carry over which can adversely affect the bioprotectants. For smaller businesses where a separate sprayer is not feasible make sure you run a tank cleaner through sprayers to reduce residues as much as possible and clean spray tanks between different products.

Spores will be applied in a dormant stage over the crop, and so may require careful handling and storage before application. For example, Prestop which can be used as a foliar spray for Botrytis control or as a root

drench for Phytopthora or Pythium will need to be stored below 4°C – preferential in a dedicated fridge where the temperature is recorded. For partially used packs keep in an air tight container to prevent degradation in storage and use desiccant packages if possible. Bioprotectants will have minimum or optimum colonization temperatures that should be considered when planning applications – for example Serenade ASO (which can be used under EAMU) can be active below 15°C but will be most active between 25 – 35°C.

Biological control predators and bioprotectants can continue to work in the retail environment to reduce wastage after sale. These approaches will address customer concerns regarding pesticide usage and residues, whilst being safe for you and your staff.

Vine weevil larvae can be controlled effectively by nematode application.

Conventional Control

Where other controls are insufficient (or are not available) chemical solutions may be the best alternative. Boom sprayers deliver the best spray coverage and so best results will be achieved if you can apply the products in this way, even if using small hand held booms. Some growers have developed innovative systems, such as lances with multiple nozzles to replicate this on the small scale. Reaper spray pistols can result in uneven application with patches under- or over-sprayed leading to patchy control or uneven growth regulator effects. Spray nozzles should also be carefully calibrated. A 110° flat fan nozzle can be a good all-round choice (these spray nozzles should be 50cm above the spray target) but manufacturers will give the BCPC nozzle classification (fine / medium / coarse) for their spray nozzles. Fine nozzles will give smaller droplets but are more likely to result in drift. Fungicides and insecticides are best applied with a nozzle delivering a medium spray quality, whilst herbicides should be applied with a coarse nozzle to minimise drift. Products are generally applied in dilutions of 200 – 400 L/Ha water, but check labels and EAMUs for specific requirements.

Planning Control Options

Cultural controls can be used all year round, and should be the starting point for any crop management decisions. For example, Pythium root rot in conifer can be greatly mitigated by keeping the crop on the dry side to help to reduce disease development. Look out for symptoms in your crops and remove affected plants promptly to reduce the risk of water-borne spore transmission. If you catch the disease early it can be a better approach to create favourable conditions for the crop rather than the pathogen – dry the crop back, remove infected plants and prevent transmission – and you may avoid the need for a fungicide drench. Effective control will also reduce the need for extra inputs, so minimising disease pressure can be of wider benefit.

***Phytophthora* symptoms in Conifers.**

Bioprotectants (including biological controls) can be used between April and October for most problems, although watch out for any temperature requirements. Likewise, look to match biological predators with conditions. For example, aphid predators will be in active at low temperatures and will be most effective around 16 – 20°C. Introduced flying predators are unlikely to be effective outside, but predatory mite control can be useful outside once you learn to work with the conditions. Consider conventional control options when pest or disease pressure is high, and a level of control not available with biologicals is required, particularly when conditions are favorable for rapid development.

Use cultural controls – prevention is better than cure, save costs, labour and crop inputs, minimise disease pressure, prevent problems like fungicide resistance developing as there are limited chemical control options for some diseases. Retaining chemical control options for when they are really needed can help to reduce the risk of resistance development – always be sure to use a combination of FRAC codes when planning your control schedule – your agronomist can help you develop a suitable program. Conventional controls can also be useful for clean up at the end of the season, or as a knockdown to deal with outbreaks to allow biological control options to re-establish.