



Grower Summary

CP 124

Managing ornamental plants
sustainably (MOPS)

Annual 2014

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The results and conclusions in this report may be based on an investigation conducted over one year. Therefore, care must be taken with the interpretation of the results.

Use of pesticides

Only officially approved pesticides may be used in the UK. Approvals are normally granted only in relation to individual products and for specified uses. It is an offence to use non-approved products or to use approved products in a manner that does not comply with the statutory conditions of use, except where the crop or situation is the subject of an off-label extension of use.

Before using all pesticides check the approval status and conditions of use.

Read the label before use: use pesticides safely.

Further information

If you would like a copy of this report, please email the AHDB Horticulture office (hort.info.@ahdb.org.uk), quoting your AHDB Horticulture number, alternatively contact AHDB Horticulture at the address below.

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Project Number: CP 124

Project Title: Managing ornamental plants sustainably (MOPS)

Work package title: Assessment of the efficacy of several conventional fungicides and biofungicides against Rust in Bellis and Antirrhinum and Powdery mildew in Aster and Pansy

Work package leader: Dr G M McPherson MBPR (Hort)

Contractor: STC

Report: Annual report 2014

Publication Date: 28 July 2015

Previous report/(s): None

Start Date: 19 May 2014

End Date: 31 December 2014

Project Cost: £241,833

Growers Summary

Headline

- Several novel conventional fungicides have been identified with excellent activity against both powdery mildew and rust in a range of ornamental crops.
- Biopesticide products were generally less effective, though one product provided excellent control of rust in Bellis and another provided moderate suppression of powdery mildew in Aster. The trials have provided potentially important new information in terms of how future biopesticide trials should be conducted.

Background and expected deliverables

The SCEPTRE programme has been very successful in identifying and evaluating novel conventional chemical fungicides and biopesticide products for pest disease and weed control in edible crops and offers considerable scope to fill gaps in the crop protection armoury as active substances and products are withdrawn. Whilst this is of some relevance through extrapolation to non-edible crops, including ornamentals, no work was conducted specifically on ornamentals as part of the SCEPTRE programme. The MOPS programme was established in response to growers concerns about potential losses of products in the ornamentals sector and in this regard is extremely important to the industry and sits alongside the minor use programme to ensure effective crop protection products remain available in the future.

The replicated trials outlined below expect to deliver useful information on the efficacy and crop safety of a range of novel crop protection products (conventional chemical and biopesticide products) for the control of both powdery mildew and rust pathogens in ornamentals. Whilst the initial studies conducted in year 1 of the project have been a success in this regard, the actual approval of specific products remains the responsibility of the manufacturers and/or marketing agents (on-label approvals), the AHDB Horticulture team (extrapolated approvals for minor use or EAMU) and the pesticide regulators (CRD) who ultimately authorize products for use in the UK.

Rust is a sporadic commercial problem on a range of ornamental species including bedding plants e.g. antirrhinum and bellis, cut flowers and bulbs e.g. chrysanthemum and hollyhock, in herbaceous perennials e.g. Heuchera and in hardy nursery stock e.g. rose, hypericum and mahonia. In general, rust diseases tend to be controlled either by avoiding susceptible species or specific cultivar selections or through the use of fungicide sprays, often indirectly

as a result of powdery mildew control. Specific rust fungicides are quite limited and rely on the use of azole products primarily.

Powdery mildew diseases commonly affect a wide range of woody and herbaceous perennial ornamentals, pot and bedding plants and cut flower species, causing yellow, crinkled and distorted leaves, premature senescence and reduced vigour. Young, soft shoots are particularly affected. Even with slight infections, the white fungal growth on leaves, stems and flowers, and associated leaf yellowing and distortion, make plants unsightly and often unsaleable.

Powdery mildew and rust diseases are usually managed by regular treatment with fungicides. Cultural practices provide partial control, but fungicides are almost invariably necessary for the production of high-quality, saleable plants. Some fungicides are more effective as protectants while others have curative (usually for a few days only) or eradicator activity. Resistance can develop when the same fungicide or products from the same fungicide group are used repeatedly on the same crop. Availability of biofungicides on ornamentals could help to reduce development of resistance to conventional fungicides. Some of the existing mode of action groups are not necessarily safe to use on all ornamental crops and the potential risk of phytotoxicity needs to be evaluated as part of the project.

Summary of the work and main conclusions

In the Summer/Autumn of 2014 a series of replicated glasshouse trials were carried out at Stockbridge Technology Centre to assess the effectiveness of a range of experimental biopesticides and conventional fungicides against powdery mildew and rust affecting commonly grown ornamental plants. Two host crops were grown for each target pathogen to maximise the chance of successfully establishing infection by these obligate pathogens,

Powdery Mildew – Aster ‘Cassandra’ and Pansy ‘Early Flowering Mix’ were selected as likely disease susceptible cultivars for use. Disease progression in the Aster crop was consistent and yielded good results with marked differences between the untreated plots and the experimental products with the conventionals performing better than the biopesticides. The disease progression amongst the pansy crop was far less widespread with low disease pressure making a meaningful comparison of the effectiveness of the experimental products more difficult.

Rust – Bellis ‘Goliath mixed’ and Antirrhinum ‘Magic Carpet Mixed’ were selected as disease susceptible cultivars. The Bellis crop was infected naturally at the beginning of the trial following the introduction of infector plants. This allowed the disease to spread evenly throughout the trial yielding promising results for conventional and biopesticide products

alike. The Antirrhinum crop was artificially inoculated with a spore suspension of the rust fungus. This resulted in an even infection across the trial area, good disease progression ensued, offering a stern test for the various products under evaluation.

The conventional products overall provided a high degree of disease control whereas in general the biopesticide products were less effective with the exception of one biopesticide which proved highly effective against Bellis rust. Important lessons were also learned about the inoculation technique employed to introduce the pathogens into the trials and the ways that these might be adapted in future studies to achieve a more natural reflection of disease pressure experienced by growers.

Action Points

This years' work has identified several promising new products that warrant further evaluation in the next phase of the MOPS project. Whilst very little phytotoxicity was observed in the host crops tested here their effect on a wider range of crops needs to be explored together with the development of spray programmes combining conventional and biopesticide products. The standard product Signum worked particularly well against both rust and powdery mildew in these trials and, as part of an integrated programme, it ought to help maintain effective disease control and at the same time also mitigate the risk of resistance developing in the pathogen population.