Grower Summary

TF 195

Sensitivity of apple powdery mildew (Podosphaera leucotricha) populations to triazole, QoI and SDHI fungicides

Annual 2013

Disclaimer

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 the full report, please email the HDC office (hdc@hdc.ahdb.org.uk), quoting your HDC number, alternatively contact the HDC at the address below.

HDC
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2TL

Tel – 0247 669 2051

HDC is a division of the Agriculture and Horticulture Development Board.

Project Number:	TF 195
Project Title:	Sensitivity of apple powdery mildew (*Podosphaera leucotricha*) populations to triazole, QoI and SDHI fungicides
Project Leader:	Dr Angela Berrie
Contractor:	East Malling Research
Industry Representative:	Mr Nigel Kitney
Report:	Annual Report 2013
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Previous report/(s):	Annual Report 2012
Start Date:	01 April 2011
End Date:	31 March 2014
Project Cost:	£42,266

Headline

- There are some indications that there is more variability in the mildew response to Systhane (myclobutanil, a triazole fungicide) among the orchards tested than to Luna Privilege (fluopyram, an SDHI fungicide) and Tucana (pyraclostrobin, a QoI fungicide).

Background and expected deliverables

Apple powdery mildew can reduce yield and fruit quality in apples. Levels as low as 8% of mildewed leaves, can reduce yield and quality on sensitive varieties such as Cox. On other varieties, high levels of powdery mildew have been recorded in many commercial orchards, but the effect on yield and quality is not as well understood as on Cox.

All growers and advisors who have been consulted agree that powdery mildew control is becoming difficult. Some badly affected farms in East Kent have orchards with an average of 50-100% mildew-infected shoots. There are many possible reasons for poor mildew control, including a limited range of effective fungicides, reduced efficacy of triazole or QoI (strobilurin) fungicides due to changes in the sensitivity of the mildew population, change in shoot growth pattern due to climate change, poor spray cover or insufficient monitoring of mildew development.

Good control of powdery mildew during the growing season is the top priority. Triazoles are the most effective fungicides against apple powdery mildew and are therefore used intensively in apple orchards as there are few alternative products. This leads to repeated use of fungicides from the same chemical group, resulting in a high risk of mildew isolates with reduced sensitivity being selected.

Alternative products for mildew control, including potassium bicarbonate, potassium phosphite, Milsana (knotweed extract) and a biocontrol agent *Ampelomyces quisqualis,* have been evaluated as part of a Defra funded project (HH2502STF). Most had limited efficacy. A new Horticulture LINK project on chemical control in horticultural crops (CP 77, SCEPTRE) started in 2011. One of its objectives is to find new fungicides and/or alternative products for controlling powdery mildew on apple. Information on whether triazole (myclobutanil, penconazole) or QoI (kresoxim-methyl, pyraclostrobin) fungicides are less effective due to reduced sensitivity of mildew populations in orchards is important, as it will help growers to select appropriate fungicides to achieve good control and minimise the risk of insensitivity development. SDHI fungicides have a different mode of action to triazoles and QoI

fungicides. New fungicides likely to be approved for use in apples in the future are SDHI fungicides and therefore it is relevant to include this group in the study.

Expected deliverables and benefits

Information on the sensitivity of apple powdery mildew to triazole and QoI fungicides and its possible contribution to the current poor mildew control will benefit the industry in the following ways:

(1) The information generated will complement that generated in the Horticulture LINK project (CP 77, SCEPTRE), in which new fungicides and/or alternative products for controlling powdery mildew are being investigated.

(2) It should provide the industry with a clearer understanding of fungicide control of apple powdery mildew.

(3) It will enable growers to select appropriate products to improve control as well as to reduce the risk of development of fungal resistance/insensitivity to fungicides.

Summary of the project and main conclusions

Potted MM106 rootstocks and Malus cv. Bittenfelder seedlings were raised in a mildew-free glasshouse. They were then treated with a range of doses of the test fungicides – Systhane (myclobutanil) Tucana (pyraclostrobin) and Luna Privilege (fluopyram) and then placed in apple orchards at East Malling and various parts of Kent where control of powdery mildew was known to be a problem. Untreated controls were also included. The apple rootstocks / seedlings were exposed to mildew for 48 hours and then collected and returned to the glasshouse to allow any mildew infection to develop. After one week the plants were assessed for mildew. The experiment was repeated twice – in May and July.

Through the mildew exposure experiment, we have determined the dose-response curves of mildew to Luna Privilege, Systhane and Tucana at several orchard sites in Kent. The results indicated that:

(1) Of the three fungicides tested, there were large differences in mildew response to the dose of Systhane among the sites tested.

(2) There were also indications that differences among sites in the mildew responses to Systhane increased from May to July.

Therefore, in year 3 the research will focus on instigation of mildew responses to the three fungicides at several sites over time (from May to August) using both seedlings and rootstocks.

Financial benefits

Growers can benefit from the project results in the following ways:

1) The results will help growers to select the correct fungicide products in spray programmes to control mildew and thereby minimise the establishment and subsequent spread of mildew strains that are insensitive to fungicides.
2) The results will help to maintain a good range of effective fungicides against mildew to achieve effective control.

Action points for growers

- There are no action points for growers at present as the project is at an early stage.