Grower Summary

FV 436

Pea Downy Mildew diversity in the UK

Final 2015

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 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:	Pea Downy Mildew diversity in the UK
Project Title:	FV 436
Project Leader:	Dr Kerry Maguire, Processors and Growers Research Organisation (PGRO)
Contractor:	PGRO
Industry Representative:	Stephen Francis, Fen Peas Ltd, The Old Farm House, Church End, Old Leake, Boston, PE22 9HR
Report:	Annual report 2015
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Previous report/(s):	N/A
Start Date:	01 April 2014
End Date:	31 March 2018
Project Cost:	£220,744

GROWER SUMMARY

Headline

Selected pea (*Pisum)* lines showing strong or partial resistance to downy mildew, a major disease in peas, provide a resource for experimental field tests at different sites in the UK, alongside the collection and identification of current downy mildew isolates.

Background

Pea downy mildew is a major disease of both vining and combining peas in the UK. Early infection can kill plants, while later infections can reduce yield by up to 55% in the UK. Quality standards for vining and picking peas are high and blemish due to disease infection is not accepted by processors. Downy mildew invades pods, reducing the quality and visual appearance of the produce. Primary infection, caused by soil-borne oospores, can be supressed by the use of the seed treatment Wakil XL (metalaxyl-M, fludioxonil and cymoxanil). Disease tolerance is present in some varieties, although downy mildew race differentiation causes variable levels of tolerance.

The primary infection of the young seedling can be reduced by growing peas in a rotation of one year in five. Due to the location of processing factories vining peas are grown in intensively cropped areas and, although the rotation in pea crops is maintained, the land may have supported many pea crops for a considerable period, allowing greater build-up of soil-borne inoculum. Wakil XL is used when there is a high risk of downy mildew either from early sowing into poor soil conditions and when weather is suitable for disease development, or where disease pressure is high. Rotation and seed treatment reduce the incidence of primary infection by soil-borne oospores but secondary infection from airborne spores cannot be controlled in this way. A descriptive list is produced annually to indicate relative tolerance of current varieties (PGRO Vining Pea Growers Guide) and growers use the lists to influence their choice of variety and seed treatment.

No single option to reduce the risk of the disease described above gives complete control of downy mildew.

Varieties may be more or less susceptible in different areas than expected. This is the result of the both the varied nature of the downy mildew population and the genetic interaction between the variety and the pathogen. The UK downy mildew population is made up of a number of genetically distinct races. A study carried out in 1989 identified 11 UK pathotypes

(Taylor et al., 1989). No studies have been undertaken since 1989 to establish dynamics and geographic spread of these populations. The project will investigate diversity and spread of the differential populations across the UK.

Summary

The project aims to provide growers with information about downy mildew race structure, geographic spread in the UK and varietal tolerance to races. Current conventional control options are limited to a seed treatment, rotational management and varietal tolerance. Varietal tolerance, however, may vary in different regions as race structure of downy mildew changes. Little is known about current race structure and the investigation will identify races in the UK and map their distribution to allow growers to utilise varietal information to greater benefit. Information from the project will feed into the breeding industry to develop improved resistance in pea varieties.

A significant body of historical literature has been collated and reviewed relating to downy mildew research and UK field trials and tests alongside the identification of early resistant germplasm. The work in the 1970-80's predates the advent of molecular markers, so there is considerable scope to re-visit and re-examine the various sources of earlier resistant germplasm and further characterise these.

Financial Benefits

Recommendations will be provided towards the end of the project and, as such, cost-benefit has not been calculated at this stage.

Action Points

Action points cannot be recommended at this stage.