

Grower Summary

FV 381a

Herbs: A survey into the prevalence and severity of *Itersonilia* spp. in UK crops (continuation 2011)

Final 2011

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

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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.

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

Project Number: FV 381a

Project Title: Herbs: A survey into the prevalence and severity of *Itersonilia* spp. in UK crops (continuation 2011)

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Headline

Survey results suggest that the highest risk of *Itersonilia* infection occurs during September and October in each year, with periods of high rainfall increasing the risk in crops at other times. It is often too late to take any action once infection is observed and crop losses can be high where environmental conditions are most conducive to pathogen development.

Background

In September 2009 a sample of dill with leaf-blight symptoms was received in the Plant Clinic at Stockbridge Technology Centre in North Yorkshire. The grower reported that several crops were similarly affected each year at around that time and that once the symptom was observed little or no control could be gained from applying fungicides. The affected crops were generally abandoned, particularly as the outdoor cropping season was drawing to a close.

Tests were carried out on the affected material, and a diagnosis of *Itersonilia* sp. was made. This fungal pathogen was later confirmed as the primary cause of infection following pathogenicity testing, when the symptoms were reproduced in healthy dill plants following inoculation with the isolated organism. The same diagnosis of *Itersonilia* sp. was later made on affected material supplied by the same grower to FERA. Additional work carried out by FERA later confirmed the pathogen as *Itersonilia perplexans*. Optimum conditions for the spread and development of this fungus are temperatures of 10-15°C and relative humidity >70%. Periods of heavy rainfall increase the risk of infection in susceptible crops.

As this was a newly recorded pathogen on dill in the UK some additional testing was carried out and the results were reported to the British Herb Trade Association (BHTA) at their meeting held at STC in March 2010. It was agreed that a better understanding of the incidence and severity of the leaf-blight pathogen on dill and other herbs was required to enable the BHTA to determine the potential impact of this new pathogen/host combination on the UK herb industry. Following low sample submission rates in 2010 few conclusions were able to be drawn regarding potential risk to UK crops; therefore, a continuation of the project into 2011 was agreed

Summary

The extension of the project into an additional year has provided an opportunity to gather additional data on the incidence and severity of the *Itersonilia* sp. leaf blight pathogen in UK herb crops. The approach to the work carried out in 2011 was similar to that done in 2010.

With industry support, through HDC, information regarding the finding of *Itersonilia perplexans* as a new threat to UK herb crops was circulated more widely to all herb growers via a survey and sample request letter, which was sent out via the HDC and the BHTA.

A relatively low number of samples were received during the early part of the 2010 season; however a flurry of samples were received between September and November as the weather conditions became cooler and wetter providing a more conducive environment for the spread and development of leaf-blight problems. A similar pattern of low sample submissions was observed in 2011, again with more samples being received in September to November.

A total of 21 samples were received over the duration of the project. Samples of dill totalled 9, 7 of which were found to be infected with an *Itersonilia* sp. Eight coriander samples were received, of which four were found to be infected with an *Itersonilia* sp. A single sample of fennel was also received which was infected with an *Itersonilia* sp. Two parsley samples submitted with foliar symptoms were found to be infected with *Plasmopara umbelliferarum* (downy mildew). Unfortunately it was not possible to draw any conclusions on geographically high disease risk areas from the samples received as these came from relatively few growers overall.

Itersonilia pastinaceae is a recognized pathogen of parsnip (an umbelliferous species). Yet, *I. perplexans* is also known to infect a number of herb species, particularly in the Umbelliferae, e.g. coriander, parsley, cumin, anise, chervil, lovage and caraway, as well as members of the Asteraceae e.g. chrysanthemum, causing a petal blight symptom. The findings from the two years of this study suggest that the leaf-blight problem is predominantly a problem in dill crops, but it is also present in coriander, parsley and fennel. Several of the later received samples of dill and coriander were from protected crops, although these were not infected with *Itersonilia* spp. This supports the view that cool wet conditions are more conducive to infection development and spread of the disease whilst growing under protection would appear to provide a more controlled environment which reduces the risk of infection, presumably due to the drier conditions.

The fungus is spread primarily as a result of air-borne dispersal, though it may also be seed-borne and spread from susceptible weed species present in or around commercial crops. There may also be a risk from infected debris in soil and movement of spores on clothing etc., although there is no direct evidence for this.

Financial Benefits

The scope of this study was to gather information on behalf of the UK herb industry. No financial benefits have resulted from this work to-date, though a better understanding of the cause of crop loss due to leaf blight could ultimately have a significant economic benefit to the industry.

Action Points

- Herb growers should remain vigilant and become familiar with the host range of the basidiomycete pathogen genus *Itersonilia* i.e. dill, parsley, fennel, coriander, cumin, caraway and perhaps tarragon and chamomile. Particular attention should be paid to crops during or following periods of high rainfall.
- Where leaf blight is found in herb crops, samples should be submitted to a diagnostic plant clinic to check for the presence of *Itersonilia* spp.
- As *Itersonilia* spp. are known to be seed-borne, seed of known susceptible herb crops should be submitted to an appropriate diagnostic clinic to check for seed-borne infection.
- Where possible plants affected by leaf-blight should be removed as soon as possible following detection to minimize risk of spread.

No detailed information on the efficacy and crop safety of fungicides approved for use on herb crops is known at this time. However, some relevant information may be gleaned from approvals on parsnip crops where *I. pastinaceae* is a significant problem. In addition to this, it is presumed that broad spectrum fungicides such as the strobilurin fungicides e.g. Amistar (azoxystrobin) have some activity against the fungus, though crop safety of each herb species would need to be evaluated in addition to the approved status on specific herb crops prior to use.