Epidemiology and Management of Fescue Diseases

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Introduction

- Stem eyespot (*Didymella festucae*) is an important disease in wet years.
- Little is known on the epidemiology of stem eyespot and other diseases.
- Need disease management to reduce yield losses.

Material and Methods

Epidemiology:

- Hirst spore trap and HOBO weather station placed in fescue field at early tillering stage.
- Monitored for six weeks.
- Spores trapped onto sticky tape on a revolving drum over a period of 7 days.
- Tape was removed, cut into 7 equal lengths, placed on microscope slides, stained with acid fuchsin in lactic acid.
- Observed for conidia of *Scoletotrichum* and ascopores of *Didymella festucae* and counted.
- Data graphed to study the association between spore counts and weather variables (Fig 1).

Disease Management.

- in 2019, three treatments (Nexicor, Prosaro XTR & check) were applied at three application dates (fall, spring (anthesis) & fall/spring) were applied to plots of creeping red fescue.
- A four replicate split plot design with application date as main plots.
- At harvest, 10 stems were sampled from 10 locations within a plot.
- Stems assessed for stem eyespot based on location and number of lesions and stem girdling
- Two rows/plot harvested for seed yield and thousand seed weight (TSW)
- In 2011, 3 treatments (one fungicide applied at 2 rates and check) at anthesis.
- Stem sampling as above.

Results and Discussion

Epidmiology.

- Diverse array of spores and pollen were trapped.
- Genera include *Mycosphaerella* (ascopores) and *Scoletotrichum* (conidia).
- Stem eyespot at moderate levels in field.
- Surprisingly, no apparent *Didymella* ascsopores observed.
- *Scoletotrichum* conidia number varied over time (Fig. 1).
- Conidia trapped increased on days following rainfall and high wind gust speed.
- Under wet conditions there is an increase in infection and conidia production which are subsequently released by raindrops/wind and dispersed by wind.
- Correlating weather with spore counts and disease development will lead to forecasting model.

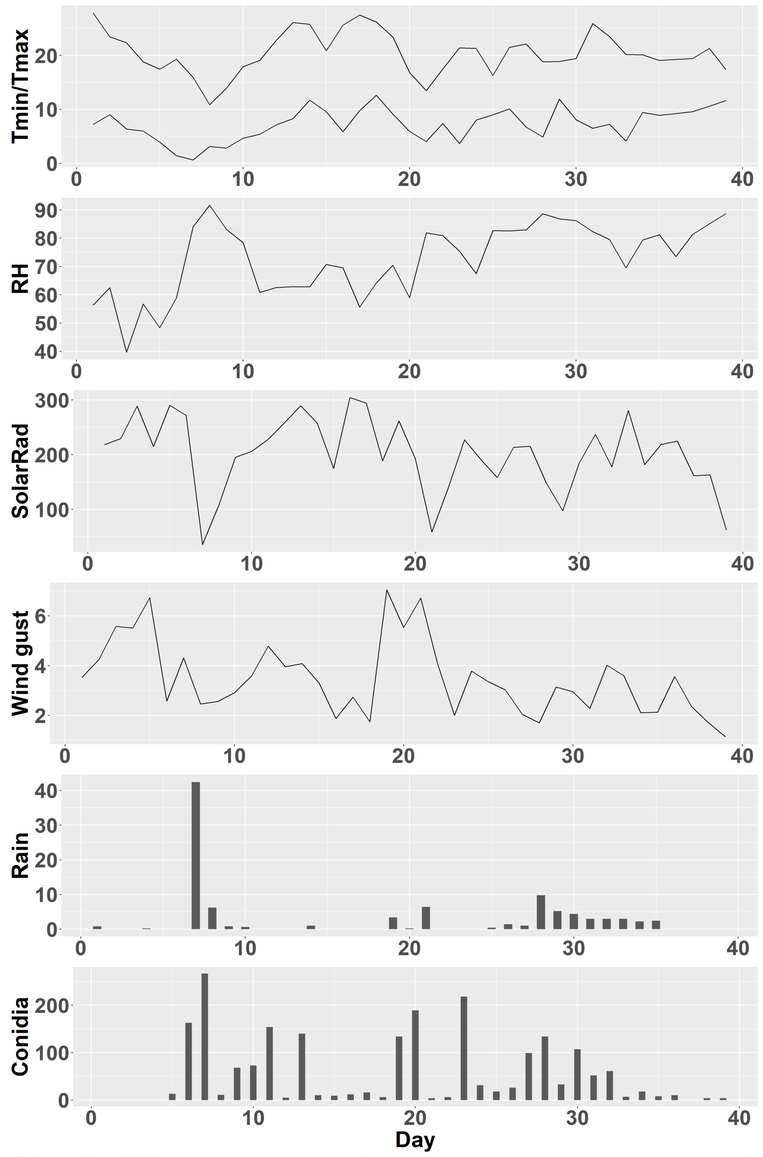

Fig 3. Weather variables and spore counts of *Scoletotrichum* in 2019.

Disease Management.

- Fall application in 2018 had little effect on disease and yield possibly due to no snow mould.
- Spring fungicide application reduced disease levels in both 2011 and 2019 (Fig. 2& 3)
- Yield increased on fungicide treated plots in 2019, but differences not significant
- TSW increased with a reduction in disease incidence in both 2011 and 2019 (Fig. 2&3)
- -TSW is a sensitive parameter for effects of stem eyespot on yield.

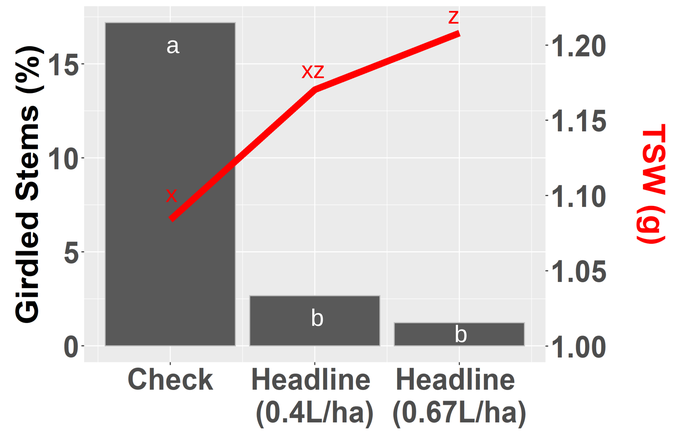

Fig 2. Girdled stem incidence and TSW in 2011

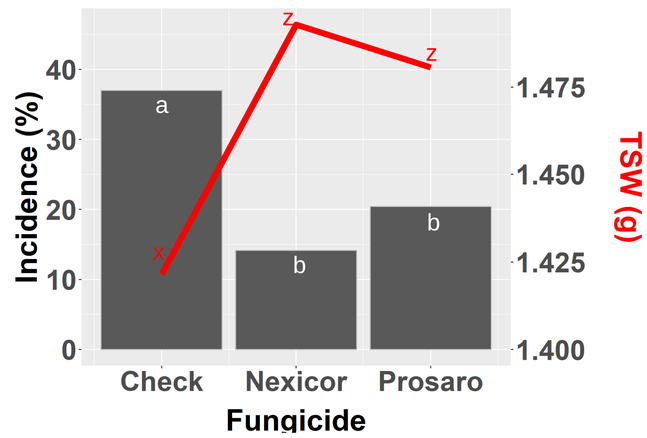

Fig 3. Diseased stem incidence and TSW in 2019.

Conclusions

- Spore trap shows that weather affects spore dynamics allowing to determine the presence and epidemiology of diseases
- Spring fungicide applications can increase yield and improve seed quality.

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