

It is Important to Identify Nematode Species as well as to Determine Their Number

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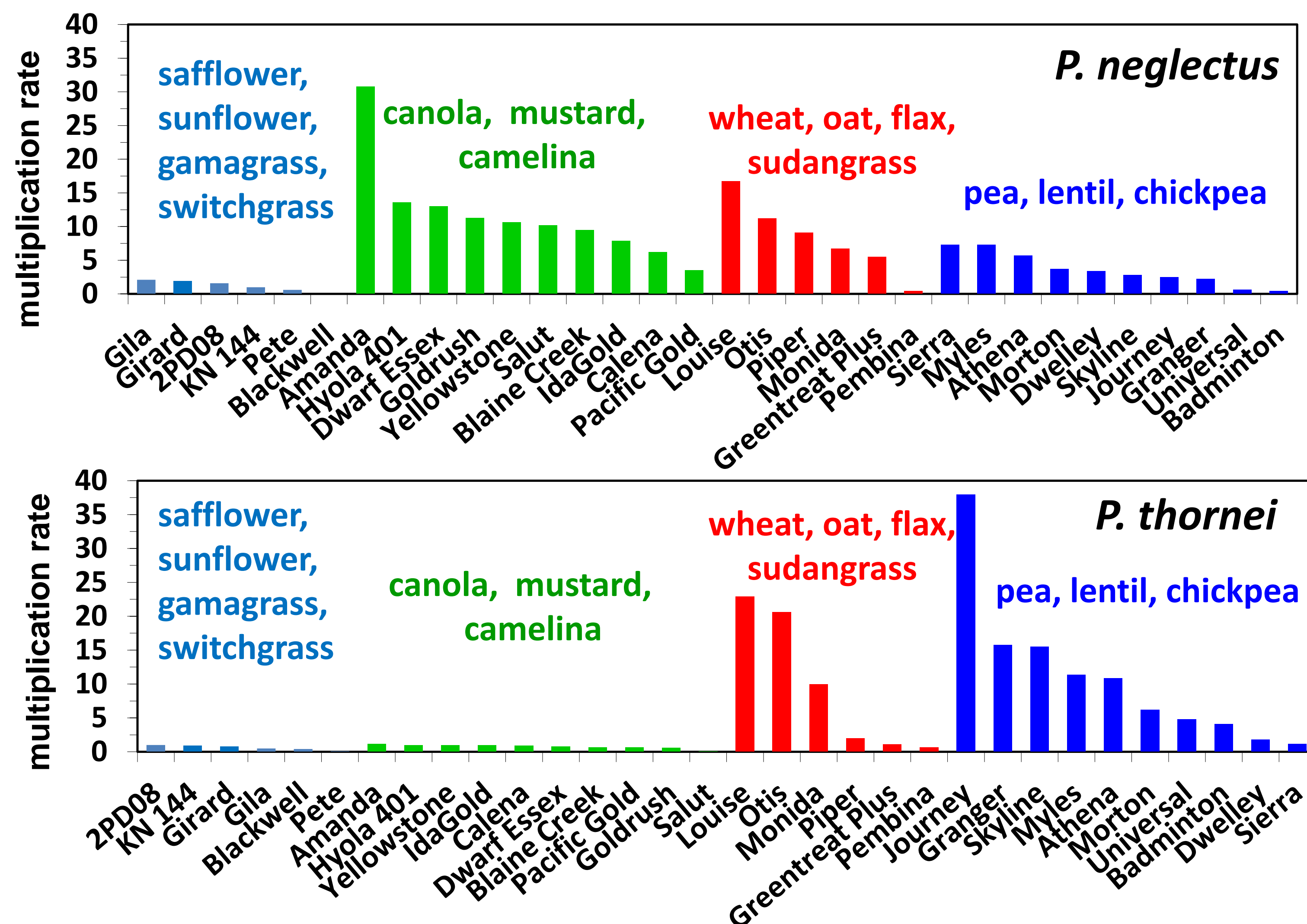
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- There are two important species of cereal cyst nematodes (CCN) in the PNW; *Heterodera avenae* and *Heterodera filipjevi*.
- There are also two important species of root-lesion nematodes (RLN) that affect field crops in the PNW; *Pratylenchus neglectus* and *Pratylenchus thornei*.
- Both species of RLN have wide host ranges among field crops commonly produced in the PNW, and both species of CCN attack only small grains.
- We have demonstrated that the two species within each nematode group (CCN & RLN) have different abilities to attack different crops and varieties.
- It is critical for you to determine which species is present before you can accurately use the information we have developed for genetic resistance and tolerance.
- In the past, it was very difficult to distinguish the species within each nematode group., and most commercial laboratories did not offer identification services.
- We therefore developed several molecular (DNA-based) testing methods to quickly and accurately distinguish these nematodes.
- These tests were offered freely to public- and private-sector laboratories that expressed a desire to incorporate this modern technology into their program.
- Our DNA-based tests are now available as a commercial service at Western Laboratories in Parma, ID.

<http://www.westernlaboratories.com>; telephone: 1-800-658-3858

- Two examples of differing responses to different CCN and RLN species are shown to illustrate the need to identify species as well as to determine their number.

Relative resistances of different crops and varieties to the root-lesion nematodes *P. neglectus* & *P. thornei*

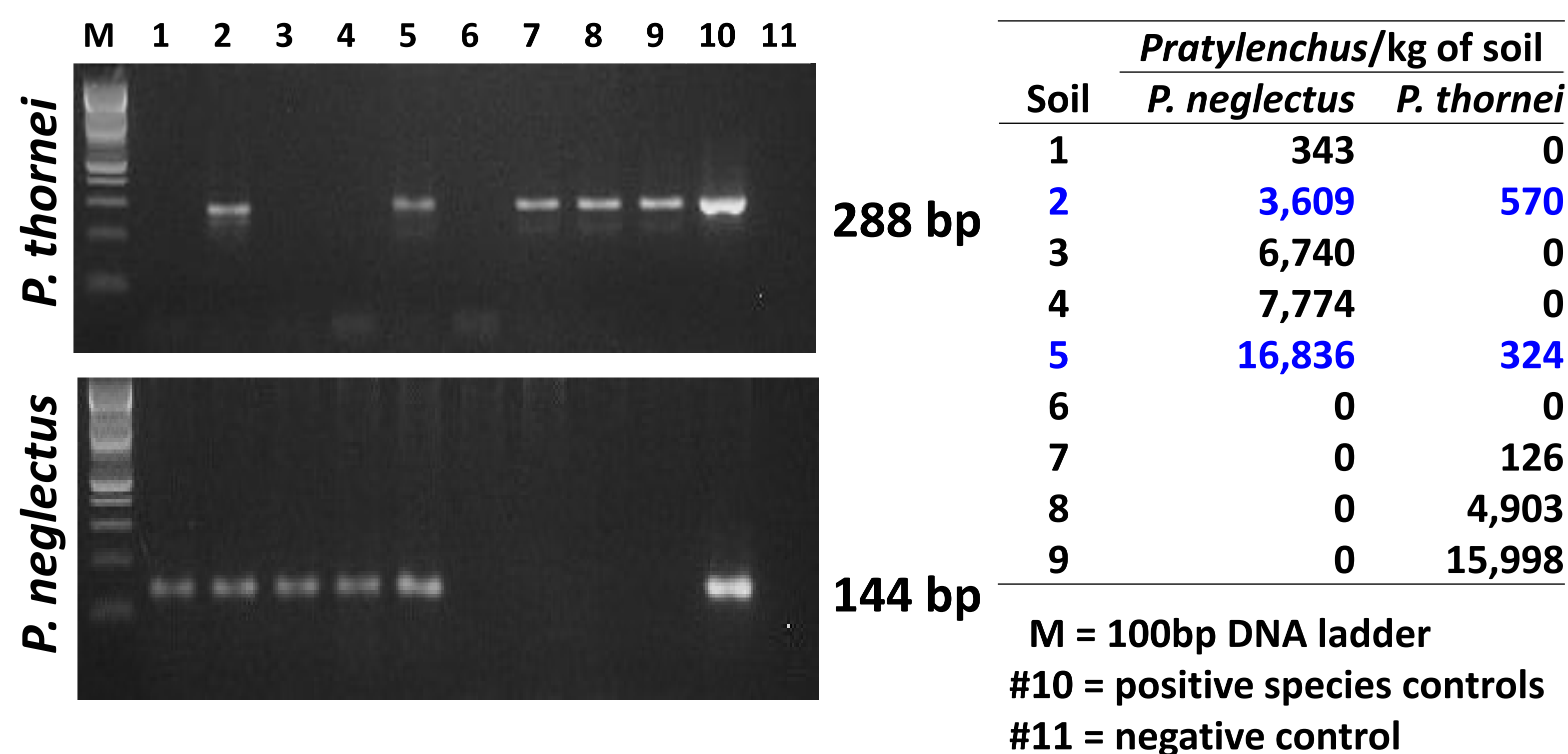


Resistances of six spring wheat varieties to the cereal cyst nematodes *H. avenae* & *H. filipjevi*

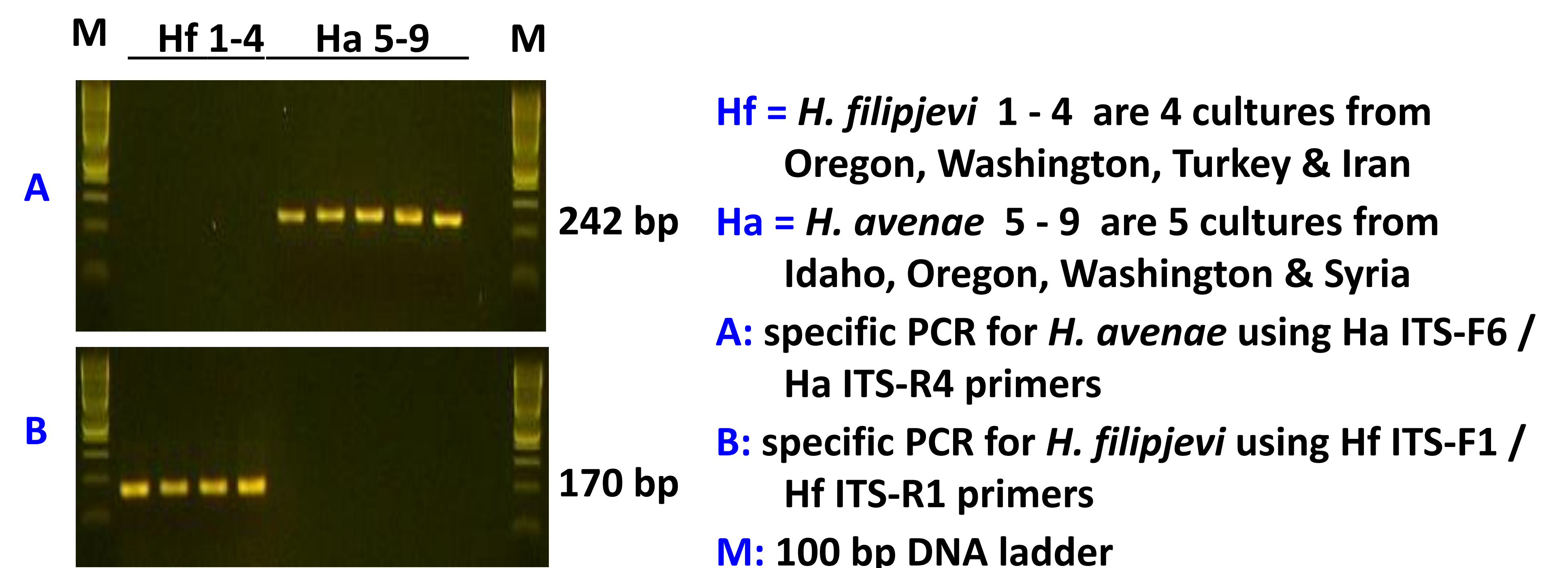
Wheat variety	<i>H. avenae</i>		<i>H. filipjevi</i>	
	cysts/plant	Resistance rating	cysts/plant	Resistance rating
Louise	34	S	61	S
WB 936	22	S	47	S
Ouyen	1	R	19	S
WB Rockland	2	R	30	S
Sönmez	24	S	3	R
SY Steelhead	26	S	5	MR

R = resistant, MR = moderately resistant, S = susceptible

PCR assays to identify RLN species in naturally-infested soils



PCR assays to distinguish the CCN species *H. filipjevi* & *H. avenae*



Publications:

1. Yan & Smiley. 2010. Distinguishing *Heterodera filipjevi* and *H. avenae* using PCR-RFLP and cyst morphology. *Phytopathology* 100:216-224.
2. Yan et al. 2013. Species-specific PCR assays for differentiating *Heterodera filipjevi* and *H. avenae*. *Plant Disease* 97:1611-1619.
3. Yan et al. 2008. Detection and discrimination of *Pratylenchus neglectus* and *P. thornei* in DNA extracts from soil. *Plant Disease* 92:1480-1487.
4. Yan et al. 2012. Detection and quantification of *Pratylenchus thornei* in DNA extracted from soil using real-time PCR. *Phytopathology* 102:14-22.
5. Yan et al. 2013. Developing a real-time PCR assay for detection and quantification of *Pratylenchus neglectus* in soil. *Plant Disease* 97:757-764.

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