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# plant disease

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## DISEASE NOTES

## First Report of *Phytophthora infestans* Self-Fertile Genotypes in Southern Brazil

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Late blight, caused by *Phytophthora infestans*, is the most devastating potato disease worldwide. The pathogen is a heterothallic species, and therefore individuals of different types (A1 and A2) must mate for sexual reproduction to take place (Fry et al. 1993). However, some isolates of *P. infestans* are homothallic and can produce oospores in the absence of A1 and A2 mating types (Orona et al. 2013). Some fungicides also can induce self-production of oospores in heterothallic isolates of *P. infestans* (Groves and Ristaino 2000). Self-fertile isolates have increased fitness, greater aggressiveness, and can be more resistant to fungicides than isolates from the A1 mating type (Zhu et al. 2016). The occurrence of *P. infestans* self-fertile isolates may increase the risk of sexual reproduction and consequently increase the genotypic diversity in the pathogen population (Han et al. 2013). During the autumn of 2011 and 2012, leaf and stem samples of potato plants infected with *P. infestans* were collected in southern Brazil. Monosporangial isolates of *P. infestans* were obtained from the samples and mating types were determined. Each isolate was paired with the A2 and A1 mating types of *P. infestans* and self-paired on Petri plates containing V8 juice agar. After this, the plates were kept at 18°C in darkness for 20 days. Three isolates collected in Paraná State (municipalities of Ponta Grossa 25°12'26"S, 50°07'11"W; Contenda 25°38'52"S, 49°34'26"W; and Castro 24°51'50"S, 49°53'50"W) formed oospores when paired with both mating type isolates and also when self-paired. Many oospores were produced from each pairing. Furthermore, the inoculation of these three self-fertile isolates on detached leaflets of cultivar Ágata (cultivated in greenhouse) reproduced disease symptoms and produced oospores. The SSR genotypes of three self-fertile and 47 heterothallic isolates were determined based on nine loci: G11, Pi02, Pi89,

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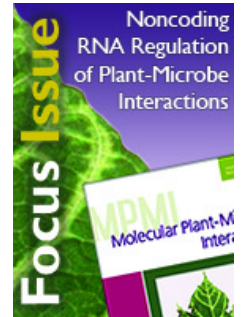
## FOCUS ISSUE

## Epidemiology:

Past, Present, and  
Future Impacts on  
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Pi04, Pi70, Pi56(Long), Pi63(Long), Pi33, and D13. The forward primers were labeled with one of the three fluorescent dyes: NED (Pi33, Pi89, and G11), FAM (Pi02, Pi70, D13, and Pi63(Long)), or HEX (Pi04, Pi56(Long)). PCR products were sequenced to determine the allele at each locus. In five (Pi02, Pi33, D13, Pi04, and G11) out of nine loci, allele sizes were different between self-fertile and heterothallic isolates. In these five loci for the self-fertile isolates, three loci were heterozygous: 146/160 bp in locus Pi02, 200/203 bp in Pi33, and 138/140 bp in D13. The Pi04 locus was homozygous monomorphic with 168/168 bp. The G11 locus was homozygous with 158/158 bp allele. Self-fertility in *P. infestans* isolates is a known phenomenon but this is the first report of self-fertile isolates obtained from field samples of potato in Brazil. This information is important for planning strategies for management of potato late blight in the Southern region of Brazil.



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Section:

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