Integrated Crop Management NEWS

Nine Species of Pythium Associated with Corn Seeding Blight in Southeastern Iowa

By Alison Robertson, Rashelle Matthiesen and Azeem Ahmad, Department of Plant Pathology and Microbiology

During the 2012 growing season, several thousands of acres of corn in southern Iowa were replanted in late May because of poor stands caused by seedling disease. Many of the fields affected were planted between April 23 and 27. From April 28 through May 8, 2 to 6 inches of rain fell across southern Iowa and southeastern Iowa, respectively, and soil temperatures dropped below 55°F for four to five days. Approximately, one week later, damped off seedlings were reported in the area.

We received funding from the Iowa Corn Promotion Board, Valent, and BASF to investigate this seedling disease epidemic. We visited 25 affected fields, collected symptomatic seedlings and recovered nine species of *Pythium*. The most prevalent species recovered was *P. torulosum*, a known pathogen of corn (Figure 1). Pathogenicity tests done in the lab and growth chamber established that cool (55°F) soil temperatures favor both seed and root rot caused by *P. torulosum*.

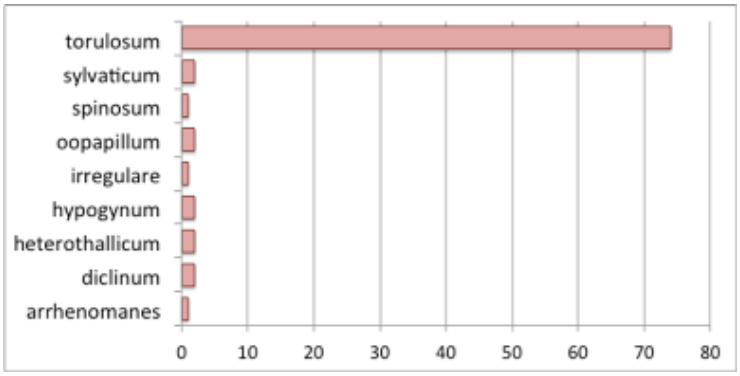

Figure 1. Species of Pythium recovered from diseased corn seedlings in southeastern Iowa in May 2012. Bars indicate number of isolates recovered from tissue samples from approximately 280 symptomatic seedlings.

Fungicide seed treatments protect germinating seed from pathogens. Metalaxyl (e.g., Allegience®) and mefenoxam (e.g., Apron®) have excellent activity against *Pythium* species. Strobilurins, e.g. azoxystrobin (Dynasty®), trifloxystrobin (Trilex®) and pyraclostrobin (included Acceleron), also have some activity against this group of pathogens. A few years ago, researchers in Ohio reported resistance to all these fungicides among *Pythium* species that they had recovered from diseased corn and soybean seedlings in Ohio (Broders et al, 2007). We tested the *Pythium* species we recovered in 2012

and also found that they differed in sensitivity to metalaxyl, azoxystrobin, trifloxystrobin and pyraclostrobin; some isolates continued to grow in the presence of the fungicide (Figure 2). Resistance to metalaxyl (and mefenoxam) and also the strobilurins has been reported for numerous pathogens.

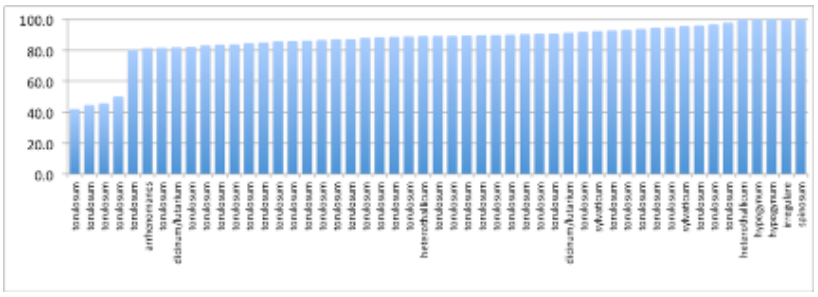

Figure 2. Range in sensitivity of *Pythium* isolates recovered from diseased corn seedlings in southeastern Iowa in May 2012 to metalaxyl. Each isolate was grown on media amended with 100pm of metalaxyl. After 72 hours, mycelial growth was measured and compared to mycelial growth on non-amended media (control). Bars indicate percent inhibition of mycelial growth. For most isolates, metalaxyl reduced mycelial growth by more than 80 percent; however, four isolates appeared relatively insensitive to metalaxyl.

Valent is expecting registration of a new fungicide, ethaboxam, in 2013, which will be combined with metalaxyl (or mefenoxam) and marketed as the AP3 Fungicide System. Ethaboxam is highly effective against *Pythium* and *Phytophthora sojae*, and belongs to a different chemical group than metalaxyl (and mefenoxam). We evaluated ethaboxam and metalaxyl alone and in combination in controlled environment trials using soil collected from four fields in southeast Iowa in which stand loss occurred during May 2012. All treatments reduced root and mesocotyl rot and improved emergence ($P<0.05$) (data not shown). In collaboration with Valent and BASF, we will be testing ethaboxam and other experimental compounds on famer's fields in Washington County, southeast Iowa, this growing season.

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Alison Robertson is an associate professor in the Department of Plant Pathology and Microbiology with extension and research responsibilities; contact her at alisonr@iastate.edu or phone 515-294-6708. Rashelle Matthiesen is a research associate; contact her at 515- 294-0581, rashelle@iastate.edu. Azeem Ahmad is an assistant scientist; contact him at 515-294-3639, aaahmad@iastate.edu.

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