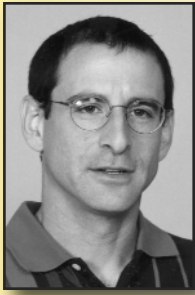


# Possible Limits To The Value Of Seed-Treatment Fungicides In Corn

DR. PAUL VINCELLI



LEXINGTON, KY.

**P**ythium species are fungal like organisms commonly found in agricultural soils. These are the primary cause of seed rot and seedling damping off in corn in Kentucky, and they are typically most active in cool, wet soils.

The trend towards earlier planting dates increases disease pressure on seedlings, because earlier planted corn is more likely to sit in cool, wet soil before successfully establishing itself. The increased use of conservation tillage also increases pressure from Pythium seed and seedling diseases, since residue protected soil does not dry out as quickly as plowed soil. The importance of effective fungicidal treatment of corn seed has increased because of these two trends.

A recent study<sup>1</sup> by plant pathologists at The Ohio State University closely examined the Pythium organisms associated with seed and seedling problems in corn and soybean in Ohio. This article focuses on their findings for corn, which are summarized as follows:

1. The most common species isolated from diseased corn seeds and seedlings were *Pythium sylvaticum* and *Pythium dissotocum*. Less common were *Pythium torulosum*, *Pythium irregulare* and *Pythium inflatum*. One interesting find was that *Pythium ultimum*, the organism that typically has been regarded far and away as the Number 1 Pythium in corn, was infrequent in their surveys. Perhaps changes in cultural practices account for this shift; perhaps something else is at work; but either way, it is interesting how *P. ultimum* was so far down the list now.

2. Of the five most common Pythiums found

in diseased corn seeds and seedlings, none were highly aggressive on corn. Two were moderately aggressive: *P. sylvaticum* and *P. irregulare*. These two species were relatively sensitive to the seed treatment fungicides mefenoxam and captan but insensitive to the QoI fungicides azoxystrobin and trifloxystrobin.

3. *P. dissotocum*, *P. torulosum*, and *P. inflatum* were slightly aggressive on corn seeds and seedlings. Based on their results, less than complete control of *P. dissotocum* and *P. inflatum* would be provided by mefenoxam, trifloxystrobin, or captan. *P. torulosum* would be difficult to control completely with mefenoxam or captan.

4. *Pythium graminicola* was isolated less commonly than the five listed above, but it was aggressive on corn and insensitive to both mefenoxam and trifloxystrobin.

## Significance

These results suggest that a diversity of *Pythium* organisms is responsible for seed and seedling disease in corn under current production practices. Significantly, these Pythiums are not all controlled by a single fungicide used for seed treatment. Because of this diversity, improving drainage and planting when soil temperatures exceed 50°F remain important cultural practices for minimizing seed and seedling diseases in corn. For fields and farms with a history of seed establishment problems in cool, wet soils, consider using a mixture of seed treatment fungicides to assure the best chance of success in stand establishment. Δ

<sup>1</sup> Broders, K. D., Lipps, P. E., Paul, P. A., and Dorrance, A. E. 2007. Characterization of *Pythium* spp. associated with corn and soybean seed and seedling disease in Ohio. *Plant Dis.* 91:727-735.

*Dr. Paul Vincelli is Extension Plant Pathologist with the University of Kentucky at Lexington.*