

Combat Fusarium Wilt

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Dark internal streaks on plant stems are a marker for plants with fusarium wilt (caused by *Fusarium oxysporum*) and give good reason for worry. The challenge is that while it's a common disease, there are many specific isolates, each of which usually has a very specific host range and reaction to control measures.

We gleaned some vital information from Robert McGovern, University of Florida-IFAS, during the SAF Annual Conference on Pest Management. Robert, along with W. H. Elmer, Connecticut Agricultural Experiment Station; D. M. Geiser, Penn State University; B. K. Harbaugh and Z. Deng, University of Florida-IFAS, Gulf Coast Research Center, have collaborated on researching *Fusarium* species, with financial help from the American Floral Endowment.

The best way to invite *F. oxysporum* onto your crops? Keep temperatures around 75 to 84F, have your soil pH below 6.0 and overwater. If you're growing field crops, growing the same crop year after year, in the same place, without rotating in a non-host plant, also encourages *Fusarium* species to hang around.

LISIANTHUS. If you grow lisianthus, *F. oxysporum f. sp. eustomae* is the isolate to fear. The good news is that several cultivars have shown resistance to the disease, including Heidi Deep Blue, Tyrol Blue Rim, Laguna Deep Rose, Malibu Deep Blue, Ventura Deep Blue, Ballet Purple Edge and Hallelujah Purple.

For chemical controls, the researchers' experiments identified Cleary's 3336 F (thiophanate methyl), Systhane WSP (myclobutanil),

Terraguard (triflumizole), Heritage (azoxystrobin) and Medallion (fludioxonil) as all showing control against fusarium wilt. Several biocontrols also got good marks in trials with lisianthus. PGA+ was considered the most effective while RootShield (*Trichoderma harzianum*) was termed as having "intermediate effectiveness." Biocontrols were applied as a soil drench one month after plants emerged, then again two to three weeks later.

CYCLAMEN. The causal agent, *F. oxysporum f. sp. cyclaminis* has proved to be a difficult one for cyclamen growers to control. Once it enters the greenhouse, you can spread it with contaminated tools and infested soil; even fungus gnats and shoreflies can spread fusarium wilt from cyclamen to cyclamen.

The researchers evaluated several biocontrols and fungicides. The experiments showed that Actinovate (*Streptomyces lydicus*), Companion (*Bacillus sp.*), SoilGard (*Trichoderma virens*), RootShield, Deny (*Burkholderia cepacia*), Medallion, Terraguard, Cleary's 3336 WP and Banrot (thiophanate-methyl and etridiazole) all produced equivalent results in reducing fusarium wilt.

CHINA ASTER. With this crop, fusarium wilt is caused by *F. oxysporum f. sp. callistephi*, which the researchers found in several seed lots they tested. However, they were able to treat seeds with bleach to disinfest them without adversely affecting germination. The process: Soak seeds in 1% sodium hypochlorite (active ingredient in bleach) for 30 minutes, then rinse the seeds and sow.



Photo courtesy Sakata Seed

Varieties such as asters Matsumoto and Serenade can give you an extra leg up in the fight against fusarium. Recent research shows that these varieties and others are resistant to fusarium wilt.

Like lisianthus, researchers were able to screen dozens of varieties for resistance to fusarium. China asters Bouquet Powderpuff Mix 2080, Benary's Princess Formula Mix, Finest Mixed 684, SC Matsumoto Formula Mix, SC Serenade Mix, Astoria Mix aster 2087, Astoria Mix 632 and aster Early Ostrich Plume 1454 all showed resistance or tolerance to fusarium wilt. ■

THE INFORMATION HERE IS BASED ON ROBERT MCGOVERN'S PRESENTATION DURING THE 2005 SAF ANNUAL CONFERENCE ON PEST MANAGEMENT AND FROM "FIGHTING FUSARIUM: A TALE OF THREE SPECIES," BY THE RESEARCHERS MENTIONED ABOVE AND PUBLISHED IN THE CONFERENCE PROCEEDINGS. THEIR WORK ON FUSARIUM IS SUPPORTED, IN PART, BY THE AMERICAN FLORAL ENDOWMENT, THE FRED C. GLOECKNER FOUNDATION, FLORIDA CALADIUM GROWERS RESEARCH FUND AND THE FIRST.