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Potential for Cucurbit Downy Mildew in 2003

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Watermelon and cantaloupe growers in Oklahoma should be wary of a downy mildew outbreak during the 2003 growing season. The disease sporadically occurs in this state. In some years such as 2000, the disease is widespread and causes rapid vine defoliation. In other years such as 2002, the disease did not develop in Oklahoma. Downy mildew is caused by a fungus that is an obligate parasite, which means that the fungus can only survive on living cucurbit plants. The fungus produces airborne spores which are carried by wind currents and are deposited onto cucurbit fields when they are washed out of the sky by rainfall. Therefore, for Oklahoma to experience a disease outbreak, three conditions have to occur. Firstly, the fungus has to be present in a neighboring production area. Secondly, the fungus has to be carried into the state with prevailing winds. Finally, weather conditions must favor spore survival during transport and infection of vines on the ground.

To aid producers in anticipating downy mildew outbreaks, North Carolina State University has developed a downy mildew forecast system. The system relies upon cooperators across the country that report disease outbreaks. These outbreaks (diseased fields) are considered sources of the spores. Next, meteorological forecasts of air movement from the source are made along with a prediction of the likelihood for spore survival and infection. In 2003, downy mildew has been reported to be widespread on cantaloupe in the Rio Grande Valley in south Texas. Already, two instances of spore transport have been predicted for Oklahoma (Fig. 1). Fortunately, we are just beginning watermelon and cantaloupe production this season. As vine growth occurs and vines become susceptible, the

risk for infection will increase should similar forecasts occur. We'll keep an eye on future predictions.

Symptoms of downy mildew appear different on cantaloupe and watermelon. On cantaloupe, brown spots are surrounded by a bright yellow halo (Fig. 2). On watermelon, spots are

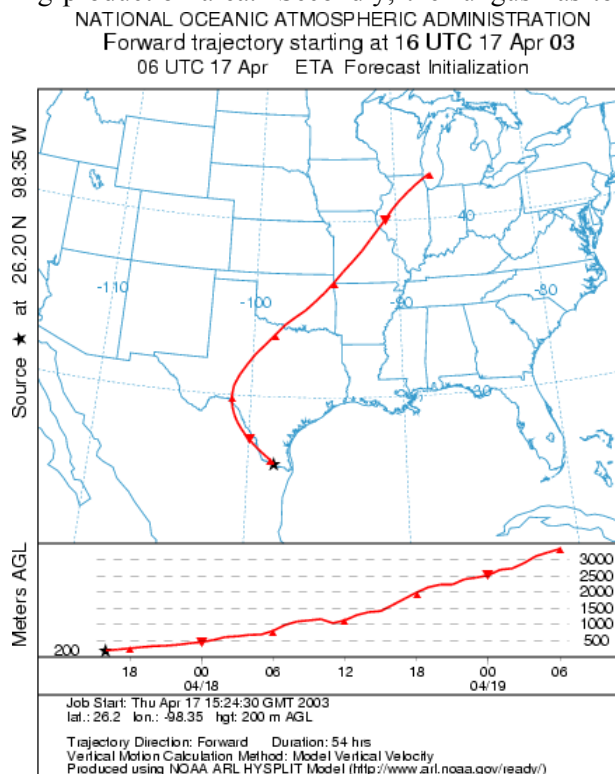


Fig. 1. Forecasted downy mildew spore movement from a source field in south Texas on 17 April 2003. Red line on map is the center of the forecasted movement which fans out from the source. Lower graph predicts the vertical height.

chocolate brown and usually lack a pronounced yellow halo (Fig. 3). The disease eventually causes a pronounced inward curling of leaves and affected fields appear scorched. When weather conditions favor disease development, infection and disease progress can occur rapidly. Unlike other downy mildew disease which prefer cool temperatures, cucurbit downy mildew can tolerate a wide range of temperatures (41 to 85°F). Periods of free moisture (dew or rain) as brief as 2 hr can support infection.



Fig. 2. Downy mildew symptoms on cantaloupe.



Fig. 3. Downy mildew symptoms on watermelon.

Control of downy mildew relies on preventive application of fungicide. Commonly used fungicides such as chlorothalonil (Bravo) and mancozeb (Dithae) are effective. We have not been able to confirm the efficacy of the new strobilurin fungicides (Quadris, Flint, Cabrio) on downy mildew, but pyraclostrobin (Cabrio) has been reported to be highly effective in other states. Applications on 7-14 day intervals are recommended.

You can find the NCSU downy mildew forecast system on the web at:
<http://www.ces.ncsu.edu/depts/pp/cucurbit/>.

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