

Cucurbit Downy Mildew Management for 2011

Cucurbit downy mildew affects most cucurbit crops in South Carolina every year. This disease is a greater threat to fall crops than to spring crops. Downy mildew spreads very quickly, so prevention and prompt action after it appears are needed.

Symptoms and Signs

Leaf spots on cucumber (left photo above) and cantaloupe start as pale green to yellow, angular spots that turn brown and spread. Leaf spots on squash and pumpkin (right photo above) are small, bright yellow flecks across the leaf surface. Slight yellowing may be seen around the edges of the spots or on other parts of the leaf that are already infected.



Brownish-purple spores are found on the bottom of infected leaves in the early morning. They give the under-side of the leaf a “dirty” appearance as seen in the following photo. If you need assistance with diagnosing cucurbit downy mildew, contact your horticulture Extension agent, the Plant Problem Clinic (www.clemson.edu/public/regulatory/plant_industry/plant_prob_clinic/index.html), or the Home Garden Information Center (www.clemson.edu/extension/hgic).



How Cucurbit Downy Mildew Spreads

Downy mildews do not survive on crop debris or in soil. They can only grow on live plants. Cucurbit downy mildew survives overwinter in southern Florida and other areas where cucurbits do not freeze.

In the spring, cucurbit downy mildew spreads to newly planted cucurbit crops and reproduces by making spores (fungal “seeds”). Spores are released from infected plants in the morning and spread by air. Wind blows spores northward from the south. Spores spread the farthest and fastest during windy, cloudy periods. Spores can be blown 600 miles in 48 hours!

Outbreaks of downy mildew are most likely in places with wet, warm weather during the time that spores are spreading. Rain washes spores out of the air and deposits them on cucurbit leaves. Rain, dew, or fog creates the conditions that favor infection and downy mildew development.

Cucurbit downy mildew also can be spread if infected transplants are shipped from one area to another. Although this route is not common, it has been seen several times in the past 5 years.

The Cucurbit Downy Mildew Forecast at <http://cdm.ipmpipe.org/> shows a map and describes where outbreaks of cucurbit downy mildew have been found. The site also predicts where spores will spread from known sources and where weather will be favorable for a disease outbreak in the next 48-72 hours.

Spraying for Cucurbit Downy Mildew

1) Fungicides are necessary to manage cucurbit downy mildew. When to start spraying is a tricky question to answer, because the time of spore arrival is different each year. Along the coast of South Carolina, cucurbit downy mildew usually shows up on or after May 1. In the Midlands and Upstate, downy mildew usually appears on or after June 1. A preventive spray program for other diseases that has chlorothalonil or mancozeb in it will give a head start if and when downy mildew spores blow in.

You can receive an e-mail or text message sent by the Cucurbit Downy Mildew Forecast team when new outbreaks are reported to the system. Follow the CDM Alert System link on the left-hand side of the page at <http://cdm.ipmpipe.org/> to sign up for these alerts.

2) Rotate fungicide products to reduce the risk of resistance to the active ingredients. In most parts of the U.S. cucurbit downy mildew is resistant to Ridomil, all strobilurin fungicides (Group 11--Cabrio, Quadris, Flint, Pristine, and Reason), and Revus. These fungicides are not recommended against cucurbit downy mildew. Tank mixing fungicides specific for downy mildew with protectants also helps prevent fungicide resistance.

3) Once the first spray is applied, continue spraying on a 7-day schedule.

4) Apply fungicides before a predicted rain rather than after it rains. Fungicides must be present on the leaves before spores arrive or germinate.

5) Cucurbits have lots of leaves that form a very dense canopy. High pressure (minimum 100 psi) and high volume (minimum 100 gallons of water per acre) are needed once vines touch each other.

Fungicides

Two different fungicide programs are recommended in 2011. The first program is for prevention. It should be used before downy mildew is found in a field. The fungicide choices are Gavel (Dow), Tanos (DuPont), and Previcur Flex (Bayer). Tanos and Previcur Flex must be tank-mixed with chlorothalonil or mancozeb.

Fungicide Product	Active Ingredient	Group	Type*
Bravo, Echo, Equus	chlorothalonil	M	P
Dithane, Mancozeb, Penncozeb	mancozeb	M	P
Champ, Champion, Kocide, NuCop	copper hydroxide	M	P
Tanos	famoxadone + cymoxanil	11 + 27	S
Gavel	zoxamide + mancozeb	22 + M	S
Previcur Flex	propamocarb	28	S
Ranman	cyazofamid	21	S
Presidio	fluopicolide	43	S

*P = protectant (remains on surface of plant).

S = systemic (taken into the plant through the leaves).

Once downy mildew has been found in a field, different fungicides should be used to get the best control. Spray Ranman (FMC) alternated with Presidio (Valent); each fungicide should be mixed with chlorothalonil or mancozeb. Rates and other details are given in the current version of the Southeastern U. S. Vegetable Crop Handbook at <http://www.thegrower.com/south-east-vegetable-guide>.

Downy Mildew on Watermelon



Watermelon is at risk from downy mildew in the fall. It spreads very quickly after infection on unsprayed crops. Chlorothalonil and mancozeb provide some protection from initial infection, but they are not enough to stop downy mildew once it starts in a field. Apply fungicides specific for downy mildew as soon as it is found.

Example of a Spray Schedule for Fall Watermelon to Prevent and Manage Gummy Stem Blight and Downy Mildew

Week	Product
1 (vine run)	chlorothalonil
2	mancozeb
3	chlorothalonil + Ranman
4	tebuconazole or Switch
5	mancozeb + Previcur Flex
6	Inspire Super
7	mancozeb + Ranman
8	Inspire Super

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Issued in Furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of May 8 and June 30, 1914.
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