Fungicides for control of powdery mildew of melons

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Registered materials effectively control the disease

Cantaloupe and crenshaw melon plants infected with powdery mildew are defoliated under severe disease conditions. Fruits become sunburned, ripen prematurely, are low in soluble solids, and have poor flavor and texture. We conducted trials in 1980, '81, and '84 to evaluate several fungicides for control of this disease, caused by the fungus *Sphaerotheca fuliginea* (Schlect.) Poll.

Cantaloupe — 1980

Cantaloupe plants, cultivar Classic, at the eight- to ten-leaf stage were selected for this trial, conducted in a commercial melon field near San Diego. Treatments were replicated four times on single-row plots 25 feet long. Materials were applied with a pressurized sprayer at the rates shown in table 1 on July 14 and 28, and August 11. Incidence of powdery mildew was rated on a scale of 0 to 10, with 10 denoting severe mildew completely covering both leaf surfaces.

Propiconazole (Tilt, an unregistered material from Ciba Geigy) gave excellent control throughout the growing season and was significantly better than other treatments. Benomyl (Benlate) + folpet (Phaltan) provided intermediate control. Folpet alone controlled mildew significantly better than the untreated plot but not at a level considered commercially satisfactory.

Crenshaw melon — 1981

Crenshaw melon plants, cultivar Burpee Early Hybrid, about 12 inches long were selected for the 1981 trial at the University of California South Coast Field Station near Irvine. Application techniques were the same as in the 1980 trial. Treatments were replicated four times on single-row plots 30 feet long, on July 8 and 22, and August 5.

Triadimefon (Bayleton) and propiconazole were significantly better than any other materials tested for the control of cucurbit powdery mildew. Benomyl + folpet gave excellent commercial control but was not as effective as the triadimefon and propiconazol treatments. Folpet alone did not provide effective commercial control but statistically was significantly better than no treatment.

1984 trial

Crenshaw melon plants, cultivar Burpee Early Hybrid, at the eight-leaf stage were selected for the 1984 trial near San Diego. Procedures were the same as in previous trials. Applications were made on August 20 and September 4 and 18.

In these tests, triadimefon and experimental products Chevron 779, Ciba Geigy 71818, Mobay KWG 0519, and DuPont 6573 all provided excellent control of powdery mildew and all were significantly better than no treatment. Stunting was observed in three of the four replicates of the Chevron 779 treatment. Further observations are needed, however, to see if this is a consistent response.

Summary

Triadimefon (Bayleton) or benomyl (Benlate) + folpet (Phaltan), of the registered materials, were effective for the control of powdery mildew of melons. New unregistered materials showing promise included DuPont 6573, propiconazole (Tilt), Ciba Geigy 71818, Mobay KWG 0519, and Chevron 779.

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TABLE 1. Effect of fungicides applied as foliar sprays for control of powdery mildew of cantaloupe, cultivar Classic, San Diego County — 1980

Material and rate/acre	Disease rating Aug. 28
Tilt 3.6E, 42 grams active	1.0 a*
Benlate 50W, 8 oz. + Phaltan 50W, 2 lb.	2.2 b
Phaltan 50W, 3 lb.	6.7 c
No treatment	8.2 d

* Duncan's multiple range test used at 1 percent level. Treatment means followed by same letter are not significantly different.

TABLE 2. Effect of fungicides applied as foliar sprays for control of powdery mildew of crenshaw melon, cultivar Burpee Early Hybrid, UC South Coast Field Station, Irvine — 1981

Material and rate/acre	Disease rating Aug. 12
Bayleton 50W, 4 oz.	0.0 a*
Tilt 3.6E, 42 grams/active	0.0 a
Benlate 50W, 8 oz. + Phaltan 50W, 2 lb.	2.5 b
Phaltan 50W, 3 lb.	5.5 c
No treatment	7.8 d

* DMRT at 1 percent level.

TABLE 3. Effect of fungicides applied as foliar sprays for control of powdery mildew of crenshaw melon, cultivar Burpee Early Hybrid, San Diego — 1984

Material and rate/acre	Disease rating Oct. 4
Ciba Geigy 71818 10W, 290 grams	0.0 a*
Mobay KWG 0519 25W, 4 oz.	0.0 a
Chevron 779 25W, 4 oz.	0.0 a
DuPont 6573 40%, 2.5 fl. oz.	0.3 a
Bayleton 50W, 2 oz.	0.5 a
No treatment	7.5 b

* DMRT at 1 percent level.

The drainage of agricultural wastewater from the rich San Joaquin Valley — a problem that has vexed farmers, scientists, and politicians for many years — reached a climax early this year, when a halt was ordered in the delivery of federal irrigation water to 42,000 acres of land in the Westlands area of the Valley. Behind this action was the detection of high levels of selenium in Kesterson Reservoir, terminus for the 80-mile-long San Luis Drain, which carries saline wastewater from the Westlands Irrigation District to Kesterson. Built in 1971, the 12 shallow evaporation ponds at Kesteron supported a variety of fish and wildlife. Mortalities and deformities attributed to accumulated selenium attracted national attention.

In this article, Dr. Richard Burau, Professor of Soil Chemistry in the Department of Land, Air, and Water at UC Davis, reviews what is known about selenium and how it enters the food chain.

Dick Venne

Kesterson Reservoir

Environmental chemistry of selenium

Richard G. Burau

Some selenium in the diets of higher organisms is healthy

Selenium is an essential trace element for animals and humans, but at elevated levels of dietary exposure, it causes toxicity. It is not known to be essential for plants. In animals, selenium is a component of glutathione peroxidase, which detoxifies peroxides as well as superoxide and hydroxide free-radicals, preventing damage to tissues, especially cell membranes. In this respect, selenium complements a function of vitamin E. It is possible that selenium also has other functions, including participation in the mitochondrial electron transport system in muscles.

Deficiency, expressed most readily in animals as "ill-thrift" disease or as the more severe "white muscle" disease, occurs in calves and lambs on both sides of the Sacramento Valley and the northern Coast Range as well as in the San Joaquin Valley of California. Livestock deficiency problems are most often associated with forages that are low in selenium because they are grown on leached, acidic soils with higher levels of free iron oxides.

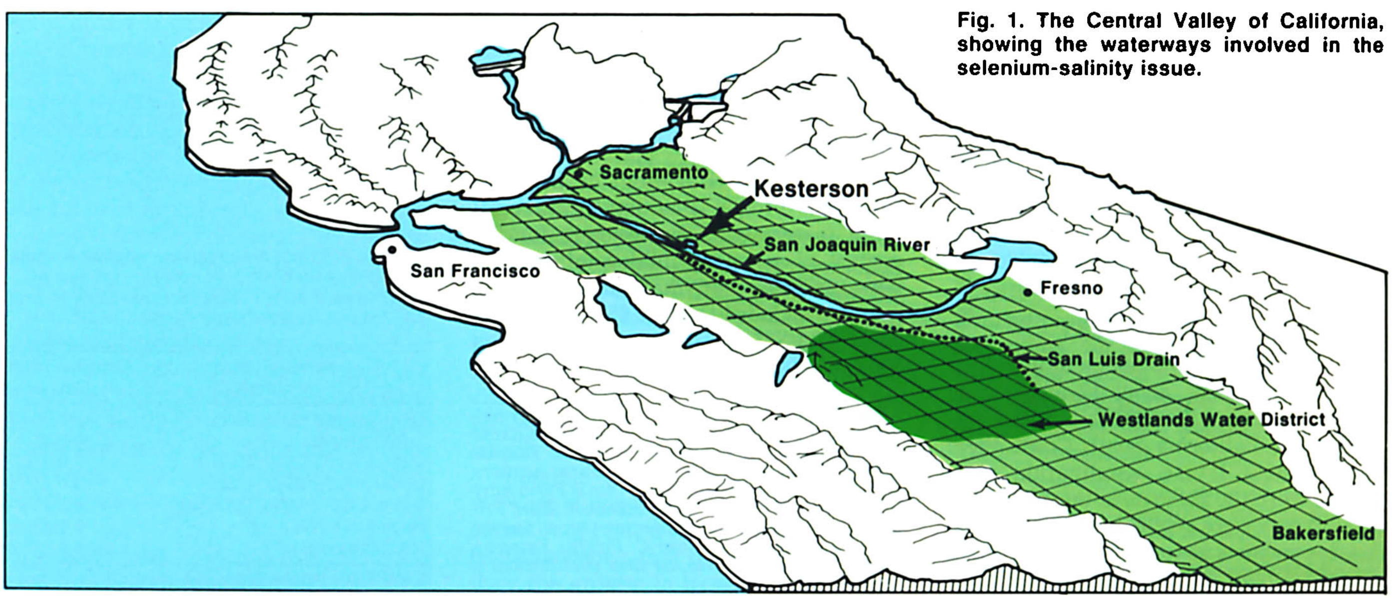

Fig. 1. The Central Valley of California, showing the waterways involved in the selenium-salinity issue.