

Comparison of fungicides for control of sweet corn rust

Albert O. Paulus □ Jerry Nelson □ Harold W. Otto □ Bernarr J. Hall

Common corn rust caused economic loss to sweet corn growers in San Diego County during 1978-80 and in Orange County in 1985. The disease, caused by the fungus *Puccinia sorghi*, is favored by cool temperatures and high relative humidity.

Abundant rust pustules on the leaves cause stunting of plants, chlorosis and death of leaves, and reduced quality and weight of ears. The fungus has an alternative host, *Oxalis*, which enables the fungus to survive from season to season. The summer spore stage (uredospores) may overwinter in temperate regions and initiate primary infections, thus bypassing the necessity of an alternative host.

We conducted research in 1978, 1980, and 1985 to determine if standard fungicides, such as maneb, mancozeb, or chlorothalonil (Bravo 500), or newly developed systemic fungicides were effective for control.

Summer trial, 1978

In the 1978 summer trial, we used the sweet corn cultivar Silver Queen in 25-foot-long plots, each containing about 16 plants. There were four replications per treatment with each fungicide applied in 100 gallons of water (table 1). Four ounces of Rohm and Haas B-1956 spreader-sticker were used with all fungicide suspensions. Sprays were applied on July 19 and 26 with a 2-gallon pressurized sprayer at 30 psi, and disease was rated on August 9.

Applications of bitertanol (BayCor) gave effective control. Maneb was not significantly different from no treatment.

Fall trial, 1978

In the fall trial, we used the same sweet corn cultivar and procedures as in the summer. Sprays were applied on August 28, September 5, 14, 22, and 28, and October 4. Disease severity was rated on October 14 (table 2).

TABLE 1. Effect of foliar fungicide sprays in control of common sweet corn rust on cultivar Silver Queen, San Diego County, summer 1978

Material and rate/acre in 100 gal. water	Disease rating Aug. 9 *†
bitertanol (BayCor) 25W, 1 lb.	1.9 a
maneb 80W, 2 lb.	3.4 b
no treatment	3.4 b

* Duncan's multiple range (DMRT) used at the 5% level. Treatment means followed by same letter are not significantly different.

† Rated on a scale of 0 to 4: 0 = no disease; 4 = severe disease and lesions completely covering the leaves.

Bitertanol and mancozeb were effective in control of sweet corn rust; triadimefon (Bayleton) was intermediate, but significantly better than no treatment.

Summer trial, 1980

For the next trial, in the summer of 1980, we applied sprays on May 20 and 29, using the same procedures and cultivar as in the previous experiments. Disease symptoms were rated June 17, and sweet corn ears were harvested and evaluated on July 9 (table 3).

Bitertanol gave significantly better control of corn rust than mancozeb, but both fungicides increased the weight of corn ears when compared with no treatment.

Fall trial, 1985

The 1985 fall trial with the cultivar Jubilee tested fungicide sprays applied on October 8 and 22 and November 8. A pressurized sprayer was used with 4 ounces of Rohm and Haas AG 98 spreader-sticker per 100 gallons of the fungicide suspension. Numerous rust lesions were present on the young corn leaves at the time of the first fungicide application. We rated disease and measured height of six plants per replicate on November 20 (table 4).

Diniconazole (Spotless) provided significantly better control of common corn rust than any other material tested. Propiconazole (Tilt), myclobutanil (Systhane), and DuPont H6573 (NuStar) gave intermediate control. Chlorothalonil was significantly better than no treatment but did not give acceptable commercial control. Diniconazole, propiconazole, myclobutanil, and DuPont H6573 resulted in increased height of plants when compared with the control.

Conclusion

Of the fungicides currently registered in California for control of sweet corn rust, maneb and mancozeb provided somewhat variable control. Chlorothalonil was ineffective under the conditions prevalent in the 1985 test. Fungicides not currently registered, but which showed promise in our tests, included bitertanol, diniconazole, propiconazole, myclobutanil, and DuPont H6573.

Albert O. Paulus is Plant Pathologist, and Jerry Nelson is Staff Research Associate, Cooperative Extension, University of California, Riverside; Harold W. Otto is Farm Advisor, Orange County; and Bernarr J. Hall is Farm Advisor, Emeritus, San Diego County.



Rust pustules on sweet corn leaves cause stunting, chlorosis, and death of leaves, reducing quality and weight of ears.

TABLE 2. Effect of foliar fungicide sprays in control of common sweet corn rust on cultivar Silver Queen, San Diego County, fall 1978

Material and rate/acre in 100 gal. water	Disease rating, Oct. 14 *†
bitertanol 25 W, 1 lb.	0.5 a
mancozeb 80W, 2 lb.	0.7 a
triadimefon (Bayleton) 25W, 1 lb.	1.6 b
no treatment	2.4 c

* DMRT at 5% level.

† Scale of 0 to 4.

TABLE 3. Effect of foliar fungicide sprays in control of common sweet corn rust in cultivar Silver Queen, San Diego County, summer 1980

Material and rate/acre in 100 gal. water	Disease rating Jun. 17 *†	Weight/ear Jul. 9* grams
bitertanol 25W, 1 lb.	1.3 a	307 a
mancozeb 80W, 2 lb.	3.1 b	307 a
no treatment	7.4 c	285 b

* DMRT at 5% level.

† Rated on a scale of 0 to 10, with 10 indicating severe disease and lesions completely covering the leaves.

TABLE 4. Effect of foliar fungicide sprays in control of common sweet corn rust in cultivar Jubilee, Orange County, fall 1985

Material and rate/acre in 100 gal. water	Disease rating Nov. 20 *†	Height Nov. 20 * inches
diniconazole (Spotless) 25W, 10 oz.	2.6 a	20.4 a
propiconazole (Tilt) 3.6 lb./EC, 4 fl. oz.	3.7 b	19.2 ab
myclobutanil (Systhane) 40W, 8 oz.	3.8 b	18.7 ab
DuPont H6573 (NuStar) 40%, 8 fl. oz.	3.7 b	18.4 abc
chlorothalonil (Bravo 500), 2.5 pt.	7.2 c	16.4 bc
no treatment	8.0 d	15.4 c

* DMRT at 5% level.

† Scale of 0 to 10.