

# Combination versus single fungicides for control of *Septoria* leafspot in celery

Albert O. Paulus □ Jerry Nelson □ Harry Otto

*With development of celery's tolerance to benomyl fungicide, new controls are being tested. Here are results.*

**S**eptoria leafspot or late blight of celery caused by the fungus, *Septoria apicola*, seriously afflicts celery in California during heavy rainfall seasons. Development of plant tolerance to benomyl fungicide caused chemical companies to recommend combination treatments or alternating applications of different fungicides. Because of conflicting evidence on the best methods to control the blight, experiments were begun in 1978 and 1979 to test various hypotheses for control.

## 1978 spring trial

Celery transplants cultivar 527OR, obtained from West Coast Celery Nursery, Oxnard, were planted February 23 at U.C.'s South Coast Field Station near Santa Ana. Each plot consisted of 15 celery plants in a single row replicated five times, with plants spaced 8 inches apart.

Plants were inoculated with a suspension of *Septoria* spores on March 7, 15, and 23 and on April 13. Forty severely affected dried celery leaves were ground in a blender for one minute and then strained through cheesecloth. The resulting spore suspension or inoculum was then sprayed over the plants. Sprinklers completely wetted the foliage afterwards, and the plants were irri-

gated four times daily for five minutes to stimulate development of late blight.

Table 1 shows treatments used and their results. Rates of materials are per 100 gallons of water. Four ounces of B-1956 spreader-sticker were applied with all fungicides. Sprays were applied for full plant coverage.

Sprays were applied on March 24, on April 6, 17, and 27, and on May 8. Disease symptoms were rated on May 17, 1978 on a scale of 0 to 4, with 0 indicating no disease symptoms and 4 indicating lesions completely covering the petiole and numerous lesions on the leaves.

Ciba Geigy 64251, Benlate + Bravo and Benlate + Dyrene gave significantly better control than did other treatments. Benlate used alone, or Bravo alternating with Benlate, provided intermediate control. Bravo 500 1 quart rate did not give adequate control, so dosage was raised to 1.5 quarts April 27 and May 8. CitCop was also increased from 1 to 2 quarts. All fungicidal treatments gave significantly better control than did no treatment.

## 1979 winter trial

Celery transplants cultivar 527OR, obtained from the Irvine Company, Irvine,

were planted October 24, 1978 in a manner similar to the 1978 trial. Plants were inoculated with a suspension of *Septoria* spores on November 16 and 20 and on December 1. Plants were sprinkler-irrigated four times daily for five minutes to stimulate development of late blight. Plots were replicated 5 times.

Sprays were applied on December 4, 14, 20, and 27, on January 3, 10, 19, and 29 and on February 8, 1979. Four ounces of B-1956 spreader-sticker were applied to all fungicide plots except the Bravo 500 + NuFilm 17 plot. Table 2 shows treatments used and the results.

Ciba Geigy 64251, Benlate + Bravo, Benlate + Dyrene, Benlate, and Benlate alternated with Bravo gave significantly better control than did other treatments. Disease pressure became so severe from mid-December to mid-January that it was necessary to spray every seven days. Bravo 500 + NuFilm was intermediate in control and not significantly different from Bravo 500 + B-1956 spreader-sticker. All fungicidal treatments gave significantly better control than did no treatment.

*Albert O. Paulus is Plant Pathologist; Jerry Nelson is Staff Research Associate, Cooperative Extension, U.C., Riverside. Harry Otto is Farm Advisor, Orange County.*

TABLE 1. Control of *Septoria* Leafspot of Celery by Fungicides, Spring 1978.

Treatments	Disease Rating* May 17
Ciba Geigy 64251 10W, 1 lb	0.4 a
Benlate 50W, 8 oz + Bravo 500, 1.5 pt	0.5 a
Benlate 50W, 8 oz + Dyrene 50 W, 2 lb	0.6 a
Benlate 50W, 8 oz	1.0 b
Bravo 500, 1 qt-(Alternate sprays)-Benlate 50W, 8 oz	1.5 bc
Dyrene 50W, 3 lb	1.6 c
Bravo 500, 1 qt to 1.5 qt	1.9 d
CitCop 4E, 1 qt to 2 qt + Bravo 500, 1:5 pt	2.1 d
No treatment	3.5 e

\*Duncan's Multiple Range test (significant 5% level). Treatments with same letter are not significantly different.

TABLE 2. Control of *Septoria* Leafspot of Celery by Fungicides, Winter 1979.

Treatments	Disease Rating* Feb. 16
Ciba Geigy 64251 10W, 12 oz	0.07 a
Benlate 50W, 8 oz + Bravo 500, 1 qt	0.08 a
Benlate 50W, 8 oz + Dyrene 50W, 2 lb	0.16 a
Benlate 50W, 8 oz	0.17 a
Benlate 50W, 8 oz-(Alternate sprays)-Bravo 500, 2 qt	0.33 a
Bravo 500, 2 qt + NuFilm 17, 1 pt	0.94 b
Bravo 500, 2 qt	0.95 b
Dyrene 50W, 4 lb	1.75 c
No treatment	3.75 d

\*Duncan's Multiple Range test (significant 5% level).