

Field evaluation of fungicide for controlling broccoli *Alternaria* head rot

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Objectives. Broccoli head rot, also known as pin rot, can cause significant problems, especially in fall broccoli production in Salinas Valley. This study investigates fungicide treatments for controlling broccoli *Alternaria* head rot in the field.

Methods. One fungicide trial was conducted in a commercial broccoli field to test the efficacy of select fungicides for controlling broccoli head rot in 2023 fall (Photo 1). Broccoli ‘Centennial’ were direct seeded on July 27. Seven fungicide treatments and a nontreated control were arranged in a randomized complete block design with four replications. Each plot consisted of two seedlines of broccoli that was 30-ft long on the 40-inch wide bed. On each side of the plot was a nontreated guard bed. Treatments were applied with a CO₂-pressurized backpack sprayer calibrated to deliver 35 gpa at 30 psi using a double TeeJet 8004E flat fan nozzles. Fungicide applications were made on October 4 and October 16. All treatments were applied with non-ionic surfactant Dyne-Amic 0.08% v/v. *Alternaria* head rot incidence was evaluated at harvest on October 23. Disease incidence was expressed as the percentage of the number of plants with *Alternaria* head rot in the total number of plants within the middle 15 ft of the plot. Symptoms caused by *Alternaria* head rot were confirmed by scraping the buds to see if the stem rot or fungi were presented (Photo 2). Data were analyzed using analysis of variance (ANOVA) and the Tukey test to separate means at $P < 0.05$. The total rainfall received one month before harvest was 0.57 inches. The average, minimum, and maximum temperatures were 62°F, 53°F, and 75°F, respectively.

Results (Table 1). The disease pressure in this trial area was low with nontreated control having 14.0% head rot. However, significant differences occurred among treatments for the mean % of *Alternaria* head rot. All treatments reduced % *Alternaria* head rot numerically, while Miravis Prime, Quadris, Priaxor, Luna Sensation, and Cabrio had significantly lower % *Alternaria* head rot than the nontreated control. And those treatments had statistically similar % *Alternaria* head rot. These results also showed that single FRAC 11, premixes with FRAC 7 and 11, and premixes with FRAC 7 and 12 provided good control of *Alternaria* head rot; single FRAC 7 provided fair control of *Alternaria* head rot.



Photo 1. The trial was conducted in a commercial broccoli field



Photo 2. Symptoms caused by Alternaria head rot were confirmed by scraping the buds to see if the stem rot or fungi were presented

Table 1. Mean of Alternaria head rot incidence at harvest

Product and rate/A	Active ingredient	FRAC group	Alternaria head rot (%/plot)
Nontreated	-	-	14.0 a ^x
Endura 9 oz	Boscalid	7	9.3 ab
Fontelis 30 fl oz	Penthiopyrad	7	8.8 ab
Miravis Prime 11.4 oz	Pydiflumetofen Fludioxonil	7, 12	2.3 b
Quadris 15.5 fl oz	Azoxystrobin	11	1.5 b
Priaxor 8.2 fl oz	Fluxapyroxad Pyraclostrobin	7, 11	0.8 b
Luna Sensation 7.6 fl oz	Fluopyram Trifloxystrobin	7, 11	0.8 b
Cabrio 16 oz	Pyraclostrobin	11	0.0 b
<i>P</i> -value ($\alpha=0.05$)			0.0005

^xNumbers in a column followed by the same letter are not significantly different based on Tukey's significant difference test ($P<0.05$).