

Evaluation of Fungicidal Management of *Alternaria* Fruit Rot on Citrus in 2000 and 2001 Seasons¹

Michael E. Matheron and Martin Porchas
University of Arizona, Yuma Agricultural Center, Yuma, AZ

Abstract

Alternaria fruit rot on *Minneola* tangelos and navel oranges can reach economically important levels in central Arizona. The objective of this study was to test the efficacy of a new fungicide, Headline (BAS 500), for disease management. A trial was conducted in 2000 and 2001 in a commercial *Minneola* tangelo grove with a history of *Alternaria* fruit rot. In 2000, nine trees were sprayed monthly from August to December with Headline at a rate of 0.25 lb active ingredient per acre. Another nine trees were not sprayed and served as controls. In 2001, 15 trees were sprayed monthly from November, 2001 to February, 2002 with the same rate of fungicide used in 2000. Another 15 trees were not sprayed and served as controls. Disease severity was evaluated monthly from September to February in each season by counting the number of infected fruit that had dropped from trees. No disease was evident from September through November, when fruit were green. By December the fruit had matured and turned color; additionally, *Alternaria* fruit rot was first observed. Low numbers of infected fruit were recorded in December and January with higher numbers of infected fruit from non-treated compared to treated trees. In February the mean number of infected fruit from trees treated with Headline and non-treated trees was 2.1 and 3.8%, respectively, in the 2000 trial and 1.9 and 4.5%, respectively, in the 2001 trial. Disease was numerically reduced in both years; however, the difference was only statistically significant in 2001. The findings of this research suggest that Headline could provide meaningful reduction in the incidence and severity of *Alternaria* fruit rot in *Minneola* tangelo groves.

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Introduction

Alternaria fruit rot is a fungal disease caused by *Alternaria citri*. The fungus attacks citrus fruit and occurs throughout the citrus production areas of the world. *Alternaria* rot is mostly a problem on fruit in storage; however, the disease can develop in the orchard, leading to fruit drop and economic loss. In central Arizona, the disease occurs on Minneola tangelos and navel oranges, with estimated losses up to 0.5 box of fruit per tree when disease severity is high. The effectiveness of fungicide treatments for disease control in citrus groves has been inconsistent, although certain fungicides are used to effectively manage diseases caused by other species of *Alternaria* on other agricultural crops. The objective of this study was to test the efficacy of a new fungicide, Headline (BAS 500), for disease control and to determine an application schedule that will maximize the level of disease control. Achievement of this objective could provide the means to successfully manage *Alternaria* fruit rot in Arizona citrus groves.

Materials and Methods

A field trial was established in a Minneola tangelo grove in Queen Creek, Arizona with a history of *Alternaria* fruit rot. For the year 2000, nine trees within the grove were sprayed with Headline at a rate of 0.25 lb of active ingredient per acre. Application of the material was accomplished with a hand gun that delivered 4.5 gallons of spray mixture to each tree. Headline was applied to trees August 9, September 7, October 12, November 3 and December 14, 2000. Another nine trees were not sprayed and served as controls. For the year 2001, 15 trees within the grove were sprayed with Headline at the same rate and amount of spray mixture per tree as in the previous year. Applications of Headline were applied November 6 and December 17, 2001 and January 3 and February 6, 2002. An additional 15 trees were not sprayed and served as controls. For both years, disease development was evaluated monthly from September through February. Normally, Minneola tangelos are harvested no later than February in this grove, so disease evaluation was terminated at that time.

Results and Discussion

No disease was evident from September through November for either trial, when fruit were green. By December the fruit had matured and turned color; additionally, the first fruit were detected with *Alternaria* fruit rot. By December the fruit had matured and turned color; additionally, *Alternaria* fruit rot was first observed. Low numbers of infected fruit were recorded in December and January with higher numbers of infected fruit from non-treated compared to treated trees (Table 1). In February the mean number of infected fruit from trees treated with Headline and non-treated trees was 2.1 and 3.8%, respectively in the 2000 trial and 1.9 and 4.5%, respectively in the 2001 trial. Disease was numerically reduced in both years; however, the difference was only statistically significant in 2001. The findings of this research suggest that Headline could provide meaningful reduction in the incidence and severity of *Alternaria* fruit rot in Minneola tangelo groves.

Table 1. Alternaria fruit rot on Minneola tangelo in 2000 and 2001.

Month	Mean number of diseased fruit per tree in 2000		Mean number of diseased fruit per tree in 2001	
	Non-treated	Headline	Non-treated	Headline
September	0	0	0	0
October	0	0	0	0
November	0	0	0	0
December	0.6	0.3	0.7	0.3
January	2.1	1.7	1.5	0.6
February	3.8*	2.1*	4.5**	1.9**

* The difference between these two values was not statistically different ($P = 0.05$).

** The difference between these two values was significantly different ($P = 0.05$).

All other pairs of disease values were not tested for statistical significance.