

**Efficacy of fungicides for management of downy and powdery mildew on lettuce, 2011.**

This study was conducted at the University of Arizona, Yuma Valley Agricultural Center. The soil was a silty clay loam (7-56-37 sand-silt-clay, pH 7.2, O.M. 0.7%). Lettuce 'Winterhaven' was seeded on 9 Nov 10 in double rows 12 in. apart on beds with 40 in. between bed centers, then sprinkler-irrigation was used to germinate the seed. Treatments were replicated five times in a randomized complete block design. Each replicate plot consisted of 25 ft of bed, which contained two 25 ft rows of lettuce separated by a 5 ft length of nontreated bed. Plants were thinned 11-12 Dec at the 3-4 leaf stage to a 12-in. spacing within rows. Treatment beds were separated by single nontreated beds. Treatments were applied with a tractor-mounted boom sprayer that delivered 50 gal/acre at 100 psi to hollow-cone nozzles spaced 12 in. apart. Foliar applications of treatments for the downy mildew portion of the trial were made 18 and 28 Jan, 14 Feb, and 3 Mar 11, depending on the treatment. Microthiol Disperss was applied 15 Feb over all downy mildew plots to control powdery mildew. Foliar applications of powdery mildew treatments were made 20 and 31 Jan, 14 and 28 Feb. The first visible signs of downy and powdery mildew were detected during the first week of February and mid-February, respectively. Maximum and minimum ranges (°F) of air temperature were as follows: Dec 10, 53-83, 31-55; Jan 11, 53-86, 30-56; Feb, 50-79, 26-51; 1-24 Mar, 68-90, 37-57. Maximum and minimum ranges (%) for relative humidity were as follows: Dec, 57-100, 9-79; Jan, 29-98, 11-34; Feb, 31-96, 7-53; 1-24 Mar, 52-89, 8-35. Total rainfall in inches was as follows: Dec, 0.36; Jan, 0.00; Feb, 0.43; 1-24 Mar 0.01. The incidence of downy mildew was determined at plant maturity (24 Mar) by counting the number of infected plants within each of the five replicate plots per treatment. The severity of powdery mildew was determined near plant maturity on 7 Mar by rating 10 plants within each of the five replicate plots per treatment using the following rating system: 0 = no powdery mildew present; 1 = powdery mildew present on bottom leaves of plant; 2 = powdery mildew present on bottom leaves and lower wrapper leaves; 3= powdery mildew present on bottom leaves and all wrapper leaves; 4 = powdery mildew present on bottom leaves, wrapper leaves and cap leaf; 5 = powdery mildew present on entire head. For powdery mildew, yield loss due to rejected heads would normally begin to occur on plants with a rating above 2.0.

Among treatments, disease reduction levels ranged from 32 to 88% for downy mildew and 59 to 76% for powdery mildew, compared to nontreated plots. All treatments for both diseases provided statistically significant reductions in disease compared to nontreated plants. One compound, NAI-2302, is primarily being developed as an insecticide; however, it did significantly reduce the incidence of downy mildew and severity of powdery mildew in this trial. Phytotoxicity symptoms were not noted on lettuce for any of the materials tested.

Treatment and rate of product/A <sup>z</sup>	Downy mildew incidence <sup>y</sup>	Powdery mildew severity rating <sup>y</sup>
Tanos 50WG 8.0 oz + Aliette 80WG 2.0 lb (1,3), Presidio 4SC 4.0 fl oz + Aliette 80WDG 2.0 lb (2,4) .....	1.0	-----
Presidio 4SC 4.0 fl oz + Aliette 80WDG 2.0 lb (1,4), Zampro 14.0 fl oz + Induce 16.0 fl oz (2), Tanos 50WG 8.0 oz + Aliette 80 WDG 2.0 lb (3) .....	1.0	-----
Presidio 4SC 4.0 fl oz + Maneb 75WG 1.5 lb (1,2,4), Aliette 80WDG 2.0 lb + Maneb 75WG 1.5 lb (3) .....	1.0	-----
Forum 6.0 fl oz (1,2,3,4) .....	1.2	-----
Zampro 14.0 fl oz + Silwet L-77 2.0 fl oz (1,2,3,4) .....	1.2	-----
Curzate 60DF 5.0 oz (1,2,3,4) .....	1.4	-----
Presidio 4SC 4.0 fl oz (1,2,3,4) .....	1.4	-----
Zampro 14.0 fl oz + Induce 16.0 fl oz (1,3), Aliette 80WDG 5.0 lb (2,4) .....	1.4	-----
Zampro 14.0 fl oz + Induce 16.0 fl oz (1,2,3,4) .....	1.8	-----
Acrobat 50WP 4.6 oz + Maneb 75WG 1.5 lb (1,2,4), Aliette 80WDG 2.0 lb + Maneb 75WG 1.5 lb (3) .....	1.8	-----
Reason 500SC 8.2 fl oz + Bond 8.0 fl oz (1,3), Previcur Flex 2.0 pt + Maneb 75WG 1.5 lb (2,4) .....	2.0	-----
Manzate FL 10.85 LG 1.6 qt (1,2,3,4) .....	2.2	-----
Presidio 4SC 4.0 fl oz + Aliette 80WDG 2.0 lb (1,3), Tanos 50WG 8.0 oz + Aliette 80 WDG 2.0 lb (2,4) .....	2.2	-----
Actigard 50WG 1.0 oz (1,2,3,4) .....	2.2	-----
Reason 500SC 8.2 fl oz (1,2,3,4) .....	2.4	-----
Zampro 14.0 fl oz + Penetrator Plus 16.0 fl oz (1,2,3,4) .....	2.4	-----

Quadris 2.08SC 15.5 fl oz (1,2,3,4) .....	2.8	-----
Aliette 80WDG 5.0 lb (1,2,3,4) .....	3.0	-----
Revus 2.08SC 8.0 fl oz (1,2,3,4) .....	3.4	-----
Tanos 50WG 10.0 fl oz (1,2,3,4) .....	3.4	-----
Manzate Pro-Stick 75WG 2.1 lb (1,2,3,4) .....	3.4	-----
Reason 500SC 6.2 fl oz + Previcur Flex 1.3 pt (1,2,3,4) .....	3.4	-----
Previcur Flex 2.0 pt (1,2,3,4) .....	3.6	-----
Cabrio 20EG 16.0 oz (1,2,3,4) .....	4.0	-----
NAI-2302 21.0 fl oz (1,2,3,4) .....	4.4	-----
Regalia 1.0 qt (1,3), Regalia 1.0 qt + Revus 2.08SC 8.0 fl oz (2), Regalia 1.0 qt + Reason 500SC 5.5 fl oz (4) .....	5.4	-----
Quintec 250SC 5.0 fl oz (1,2,3,4) .....	-----	0.8
Rally 5.0 oz (1,2,3,4) .....	-----	0.8
NAI-2302 21.0 fl oz + Dyne-Amic 16.0 fl oz (1,2,3,4) .....	-----	1.2
Regalia 1.0 qt (1,3), Pristine 38WDG 1.25 lb (2,4) .....	-----	1.3
Regalia 1.0 qt + Quintec 250SC 6.0 fl oz (1,2,3,4) .....	-----	1.4
Untreated control .....	8.0	3.4
LSD ( $P = 0.05$ ) <sup>x</sup>	1.3	0.2
z	Foliar applications of treatments for downy mildew: (1) = 18 Jan; (2) = 28 Jan; (3) = 14 Feb, (4) = 3 Mar 11 and for powdery mildew: (1) = 20 Jan; (2) = 31 Jan; (3) = 14 Feb; (4) = 28 Feb. The first visible signs of downy and powdery mildew were detected during the first week of Feb and mid-Feb, respectively.	
y	Disease incidence was assessed at plant maturity on 24 Mar for downy mildew by counting the number of plants infected per replicate plot. The severity of powdery mildew was determined near plant maturity on 7 Mar by using the rating system described earlier to rate 10 plants per replicate plot.	
x	Least Significant Difference at $P = 0.05$ . Values in each column differing by more than the least significant difference are significantly different according to Fisher's Protected LSD test.	