LETTUCE (*Lactuca sativa*)
Fusarium wilt; *Fusarium oxysporum* f. sp. *lactucae*

M.E. Matheron and M. Porchas, University of Arizona, Yuma Agricultural Center, Yuma, AZ 85364.

Effect of lettuce cultivars and Actigard on development of Fusarium wilt, 2015.

Two trials were conducted, each in a different grower's field naturally infested with *Fusarium oxysporum* f. sp. *lactucae*, to evaluate the effect of selected lettuce cultivars and application of Actigard on development of Fusarium wilt. The soil in each field was a silty clay loam. Lettuce was seeded in double rows 12 in. apart on beds with 42 in. centers, then sprinkler-irrigated to germinate seed in on 10 Sep and 16 Sep for trial 1 and trial 2, respectively. Lettuce cultivar and Actigard treatment plots were replicated four times in a randomized complete block design with each replicate cultivar plot consisting of 100 ft of bed and each Actigard plot consisting of 150 ft of bed, all containing two rows of lettuce. Plants were thinned 28 Sep and 07 Oct for trial 1 and trial 2, respectively, at the 3-4 leaf stage to an approximate spacing of 12 in. All plots were separated by a 5 ft length of bed not planted to lettuce. The two tested rates of Actigard were applied to the surface of the bed in trial 1 on 10 Sep (at seeding), then to the surface of the bed and plants on 24 Sep, 8 Oct, and 22 Oct. For trial 2, treatment dates were 16 Sep (at seeding), then on 30 Sep, 14 Oct, and 28 Oct. Actigard treatments were applied with a CO_2 backpack sprayer that delivered 50/gal per acre at 40 psi to flat-fan nozzles. Symptoms of Fusarium wilt, including stunting and chlorotic leaves, were first observed on 1 and 8 Oct in trial 1 and 2, respectively. Maximum and minimum (EF) soil temperatures at the 4 in depth recorded at a nearby University of Arizona AZMET (Arizona Meteorological Network) weather station were as follows: 97-89 during Sep; 92-76 during Oct; and 77-57 during Nov. Monthly rainfall in inches was as follows: Sep, 0.30; Oct, 0.21; Nov, 0.24. Disease severity was recorded at crop maturity (from 16 to 20 Nov) for both trials by counting the proportion of lettuce plants in each plot that were unmarketable due to death or stunting resulting from infection by *Fusarium oxysporum* f. sp. *lactucae*. Disease severity data were subjected to analysis of variance (ANOVA), then compared for significance using Fisher's Protected LSD test.

Compared to disease levels in Trial 1, the incidence of Fusarium wilt in Trial 2 was 48 and 13% lower, respectively, among tested head lettuce and romaine cultivars. With the exception of the head lettuce cultivar Midway in trial 1, all tested romaine cultivars had significantly less Fusarium wilt than head lettuce in both trials. Actigard applied four times at a rate of 1.0 oz/A significantly reduced the incidence of Fusarium wilt in both trials compared to nontreated plants of the same cultivar, with disease levels not significantly different from those on most romaine cultivars. No symptoms of phytotoxicity were observed on lettuce treated with Actigard.

Lettuce cultivar and rate of Actigard/A	Days after first application [y]	Percentage of plants dead or diseased at crop maturity [x]	
		Trial 1	Trial 2
Crusader (H) [z]	-------	31.0 a	14.5 a
Dover (H)	-------	30.5 ab	14.8 a
Sunquest (H)	-------	29.5 abc	15.2 a
Prestige (H)	-------	28.0 abc	15.2 a
Raider (H)	-------	27.0 abc	13.5 a
LT 4083 (H)	-------	23.0 abcd	13.5 a
Raider (Actigard 50WG 0.75 oz)	0, 14, 28,42	20.0 bcd	9.8 b
Midway (H)	-------	19.0 cde	10.2 b
Raider (Actigard 50WG 1.0 oz)	0, 14, 28,42	13.2 def	6.2 c
Vanguard PIC (R)	-------	8.5 efg	5.2 c
Green Thunder (R)	-------	6.2 fg	4.8 c
Rio Bravo (R)	-------	5.5 fg	4.0 c
King Henry (R)	-------	3.8 fg	4.0 c
Valley Heart (R)	-------	2.0 g	4.5 c
LSD ($P = 0.05$)		10.8	2.4

[z] (H) and (R) denote head lettuce and romaine cultivars, respectively.

[y] Actigard treatments were applied for trial 1 on 10 Sep, 24 Sep, 8 Oct, and 22 Oct and for trial 2 on 16 Sep, 30 Sep, 14 Oct, and 28 Oct. Symptoms of Fusarium wilt, including stunting and chlorotic leaves, were first observed on 1 and 8 Oct in trial 1 and 2, respectively.

[x] Disease severity was recorded at crop maturity (from 16 to 20 Nov) for both trials, as described earlier. Values in each column followed by a different letter are significantly different from each other according to Fisher's Protected LSD test.