ONION (*Allium cepa* 'Vaquero')
Center rot; *Pantoea agglomerans*
Sour skin; *Burkholderia cepacia.*

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Evaluation of bactericides for management of bacterial leaf blight and bacterial bulb rot in onions, 2023.

A field trial was conducted at the University of California Shafter Research Station in Shafter, CA to evaluate the efficacy of nine bactericide treatments for management of bacterial diseases caused by *Pantoea agglomerans* and *Burkholderia cepacia*. The trial was direct-seeded using yellow onion cv. 'Vaquero' on 13 Feb 23. The trial was a split plot, randomized complete block design with four replications of a factorial treatment design: two inoculation treatments (inoculated or not inoculated) applied to main plots, and eleven treatments (ten bactericides and a control treatment) applied to split plots. Each plot was one 30-in. bed wide (with 2 rows of onion) x 20 ft long, including 5-ft buffer between adjacent plots. Treatment applications began at the first sign of leaf senescence on 19 Jul and continued at a 7-14 day interval, until 30 Aug. Treatments were applied using a battery operated backpack sprayer calibrated to deliver 45 gpa at 30 psi using a flat fan JSF11002 nozzle. Inoculum consisting of an equal ratio of the two pathogens was applied to relevant plots on 20 Jul, 36 hrs after the first application of each bactericide treatment, on 3 Aug when 25% tops were down and on16 Aug, at about 50 % tops down. Inoculum was applied in the evening at 10^8 CFU/ml with a battery-operated backpack sprayer at 32 gpa and 25 psi. The trial was irrigated using overhead sprinklers throughout the season and irrigated every other day in the afternoon with 0.25 in. of water from mid-Jul through Aug to favor bacterial infection. Each plot was rated three times for incidence (percentage of plants with foliar bacterial symptoms) on 19 Jul, prior to the first bactericide application, on 23 Aug and 6 Sep. On 25 and 26 Sep, the trial was harvested and bulbs from each inoculated and non-inoculated plot were weighed for marketable yield (t/A). On 26-29 Sep, fifty bulbs from each plot were cut open to determine incidence of internal bacterial bulb rot. Data were subjected to analysis of variance (ANOVA) using PROC GLM (SAS ver 9.4). The project was funded by Specialty Crops Research Initiative Award 2019-51181-30013 of the USDA National Institute of Food and Agriculture.

Symptoms of foliar bacterial disease observed on 23 Aug, 7 days after the third inoculation, averaged 24.8% in inoculated plots and 27.7 % in non-inoculated plots. By 6 Sep, the incidence decreased to 20.3% and 18.5% in inoculated and non-inoculated plots respectively. None of the bactericide treatments reduced the incidence of foliar bacterial symptoms, and there was no significant interaction between inoculation and bactericide treatments. At harvest, inoculation increased the incidence of internal bulb rot from 5.4 to 10.4%. However, the bactericide treatments had no effect on bulb rot incidence or marketable yield. In conclusion, the bactericides evaluated in this study were largely ineffective in managing bacterial blight and bulb rot in this trial despite the preventative and weekly applications.

Main plot and split plot treatments	**Foliar disease incidence (%)**		**Bulb rot incidence (%)**	**Marketable Yield (ton/ac)**
	Aug 23	Sep 6	Sep 25, 26 (harvest)	
Main plots				
Inoculated	24.8	20.3	10.4	16.3
Non-inoculated	27.7	18.5	5.4	17.6
P value (α=0.05)	0.06	0.03	<0.0001	0.07
Split plots and rate/A A-F*				
Agrititan (1:10 v/v)	34.2	18.6	7.6	16.9
Badge 2.75 pt	23.0	18.8	8.7	18.7
ChampIon++ 1.5 lb	23.6	16.2	7.5	16.3
Control	29.2	20.2	7.9	16.4
Kocide 3000 1.5 lb	25.0	20.8	10.2	16.8
LifeGard 2 oz	26.2	22.0	6.6	17.9
ManKocide 2.25 lb / LifeGard 2oz	25.8	19.6	7.2	14.9
Mastercop 1.5 pt	24.6	20.2	6.4	16.8
Nordox 2 lb LifeGard 2oz	28.2	17.4	7.3	18.3
Nucop 1.5lb	24.6	22.2	9.2	16.2
Velum One 6.5 oz (total)/ Nordox	24.2	17.6	7.6	17.3
P value (α=0.05)	0.11	0.06	0.85	0.61

* Treatments applied A-F: A: 19 Jul; B: 26 Jul; C: 2 Aug; D: 9 Aug; E: 23 Aug; F:30 Aug.