

Evaluation of bactericides and plant defense inducers to manage center rot of onion in Georgia, 2020.

Four rows of ‘Century’ onion were transplanted into 6-ft beds (panels) on 8 Dec (2019) at the University of Georgia, Tifton, GA. The fertility and insecticide programs were consistent with the University of Georgia Extension Service recommendations. Experimental design consisted of a randomized complete block with four replications. Treated plots were 20-ft long and were separated on each side by non-treated border panels. Plots were separated by a 3 ft bare-ground buffer within the row. Treatments were applied with a backpack sprayer calibrated to deliver 40 gal/A at 75 to 80 psi through TX-18 hollow cone nozzles. Treatment applications were made on 20 Mar, 27 Mar, 3 Apr, 10 Apr, 17 Apr, and 24 Apr. Plots were irrigated once a week using overhead irrigation. Natural inoculum was relied upon. Foliar disease severity was assessed on 25 Mar, 9 Apr and 28 Apr as percent leaf area with typical bacterial disease symptoms (water-soaked necrotic lesions) per plot. Onion bulbs from the center of each plot with dimension 6 ft × 3 ft were hand-harvested (30 Apr), field cured (2 days) and then stored at 4°C for 30 days. On 2 Jun onion bulbs from each plot were individually cut using a sterile knife and assessed for the presence of center rot symptoms. Data for foliar disease severity, area under disease progress curve (AUDPC) and percent center rot incidence in bulb were analyzed using SAS 9.4 (SAS Institute, Cary, NC) and means were compared using the Fisher’s protected LSD test at $P \leq 0.05$. The mean rainfall received during Dec (2019) and Apr (2020) was 6.5 in. and 3.5 in., respectively. The average high and low temperatures for the month of Dec (2019) were 58° and 42° F, respectively and for the month of Apr (2020) were 81° and 58° F, respectively.

Foliar symptoms of center rot were first appeared on 25 Mar with significantly higher disease severity observed in the non-treated check (44.9%) than in the Mankocide-treated plots. Disease progressed over a four-week period and reached to a level of 87.5% (disease severity) on 28 Apr, in non-treated check plots, which was significantly higher than the bactericide-treated plots expect for the Oxidate only (71.3%) treatment. Interestingly, during the same period, center rot severity for plant defense inducers (Leap only and Actigard only) were not significantly different from the non-treated check. The AUDPC values also followed the similar trend. Incidence of center rot in bulbs was significantly lower for the treatments; Mankocide, Kocide 3000, Champ, Agrititan, Nordox, Mastercop, and NuCop compared with the treatments; Oxidate, Leap, and Actigard, and the non-treated check. Phytotoxicity was observed with Oxidate treatment but not with other treatments.

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Treatment and rate of product per acre	Application No. ^z	Initial disease severity (%) on 25 Mar	Final disease severity (%) on 28 Apr ^y	AUDPC ^x	Center rot incidence in bulb (%) ^w
Mankocide 2.5 lb	1-6	10.7 b ^x	43.8 c	358.8 c	9.1 c ^y
Kocide 3000 1.5 lb	1-6	28.9 ab	50.0 bc	540.7 bc	29.8 bc
Champ 1.5 lb	1-6	15.1 ab	51.3 b	464.8 bc	18.0 c
Oxidate 5.0 32 fl oz per 100 gal	1-6	40.0 a	71.3 a	791.2 ab	55.2 a
Agrititan 800 ppm	1-6	29.4 ab	58.8 b	602.8 bc	19.5 c
LifeGuard 2 fl oz	1-6	22.7 ab	48.8 bc	469.2 bc	26.8 bc
Nordox 1 lb	1-6	18.0 ab	53.8 b	502.4 bc	17.2 c
Mastercop 1 pt	1-6	23.7 ab	48.9 bc	489.6 bc	12.2 c
Leap 1 qt	1-6	32.4 ab	70.0 a	703.8 ab	52.5 ab
Actigard 0.5 fl oz	1-6	34.9 ab	70.0 a	699.5 ab	57.5 ab
NUCop 1.5 lb	1-6	15.2 ab	55.0 b	485.4 bc	18.8 c
Non-treated check	-	44.9 a	87.5 a	1012.2 a	74.8 a

^zApplication dates were 1=20 Mar; 2=27 Mar; 3=3 Apr; 4=10 Apr; 5=17 Apr and 6=24 Apr.

^yFoliar disease severity was rated on a 0 to 100 scale (0 = no infection and 100 = 100% of leaf area infection) on 25 Mar, 9 Apr and 28 Apr.

^xAUDPC was calculated from ratings taken on 25 Mar, 9 Apr and 28 Apr.

^wMean center rot bulb incidence was calculated as number of bulbs with center rot/total number of bulbs evaluated × 100.

^vMeans followed by the same letter in each column are not significantly different according to Fischer’s LSD at $P < 0.05$.