SWEETPOTATO (*Ipomoea batatas* 'Covington')
Rhizopus soft rot; *Rhizopus stolonifer*

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Evaluation of fungicides and alternative methods for control of Rhizopus soft rot in sweetpotato, 2016

The experiment was conducted at the Central Crops Research Station in Clayton, NC. Sweetpotato roots used in the study were obtained from a commercial packing facility at the time of each inoculation and were rinsed prior to use. Roots were previously cured and were selected based upon similar size, shape, and disease free appearance. Ten roots were used per replication in fungicide, UV-C irradiation, and static ClO_2 experiments. Each of the experiments were conducted three times. Twenty-five roots were used per replication in the active ClO_2 experiment. The active ClO_2 experiment was conducted twice. Prior to inoculation, roots were wounded using a calibrated, rubber-band propelled wooden dowel. Roots for the fungicide and active ClO_2 test were then inoculated with a 5mm mycelia plug. Roots for the UV-C irradiation and static ClO_2 tests were inoculated by dipping the wounded roots into a 10^6 spores/mL *R. stolonifer* suspension. All roots were evaluated ten days post-inoculation for disease incidence. Percent disease incidence data for all treatments was analyzed in R using Pearson's χ^2 test. A posthoc χ^2 test was used for separation of treatments. P-values were adjusted using the false discovery rate method and were considered significant at 0.05.

Disease incidence in inoculated, untreated controls was moderate to high (53.3-76.7%). Symptoms were first observed two days after inoculation. UV-C irradiation at 3.24 KJ/m^2 after inoculation and postharvest dips in Botran 75W, Z-Series, and StorOx 2.0 significantly reduced disease incidence. Static treatments of ClO_2 fumigation were also effective in reducing sporulation of *R. stolonifer* on infected roots. The static treatments of ClO_2 fumigation also seemingly caused a phytotoxicity response in the roots resulting in sunken areas around wounded tissue.

Treatment	Tested Rate	Disease incidence (%) ± SE[z]
UV irradiation		
Uninoculated control	-	6.7 ± 6.7 a
Inoculated control	-	76.7 ± 6.7 c
UV before inoculation	1.08 KJ/m^2	73.3 ± 17.6 c
UV before inoculation	3.24 KJ/m^2	80.0 ± 0.0 c
UV before inoculation	7.56 KJ/m^2	60.0 ± 0.0 c
UV after inoculation	1.08 KJ/m^2	66.7 ± 12.0 c
UV after inoculation	3.24 KJ/m^2	26.7 ± 12.0 ab
UV after inoculation	7.56 KJ/m^2	53.3 ± 12.0 bc
ClO_2 Fumigation		
Static		
Uninoculated control	-	6.7 ± 6.7 a
Inoculated control	-	63.3 ± 6.7 b
Low ClO_2	90 mg	50.0 ± 15.3 b
High ClO_2	270 mg	50.0 ± 17.3 b
Active		
Uninoculated control	-	0.0 ± 0.0 a
Inoculated control	-	66.0 ± 2.0 bc
Low ClO_2	240 mg	72.0 ± 4.0 c
High ClO_2	480 mg	46.0 ± 2.0 b
Alternative dips		
Uninoculated control	-	3.3 ± 3.3 a
Inoculated control	-	53.3 ± 8.8 c
Botran 75WP	1.2 g/L	10.0 ± 5.8 ab
Z-Series	5 ppm	13.3 ± 3.3 ab
StorOx 2.0	20.0 ml/L	13.3 ± 6.7 ab
Prophyt	5.0 ml/L	20.0 ± 5.8 abc
Zonix	6.25 ml/L	40.0 ± 10.0 bc

[z]Percent disease incidence ± standard error (SE). Means followed by different letters indicate significance between treatment levels within each factor at the 0.05 significance level based on χ^2 analysis. Treatments that share a letter are not significantly different.