

NWA Grant Project Final Report

Project Title: Determining the efficacy of pre-plant fumigation and compact bed geometry for Fusarium wilt management in seedless watermelon.

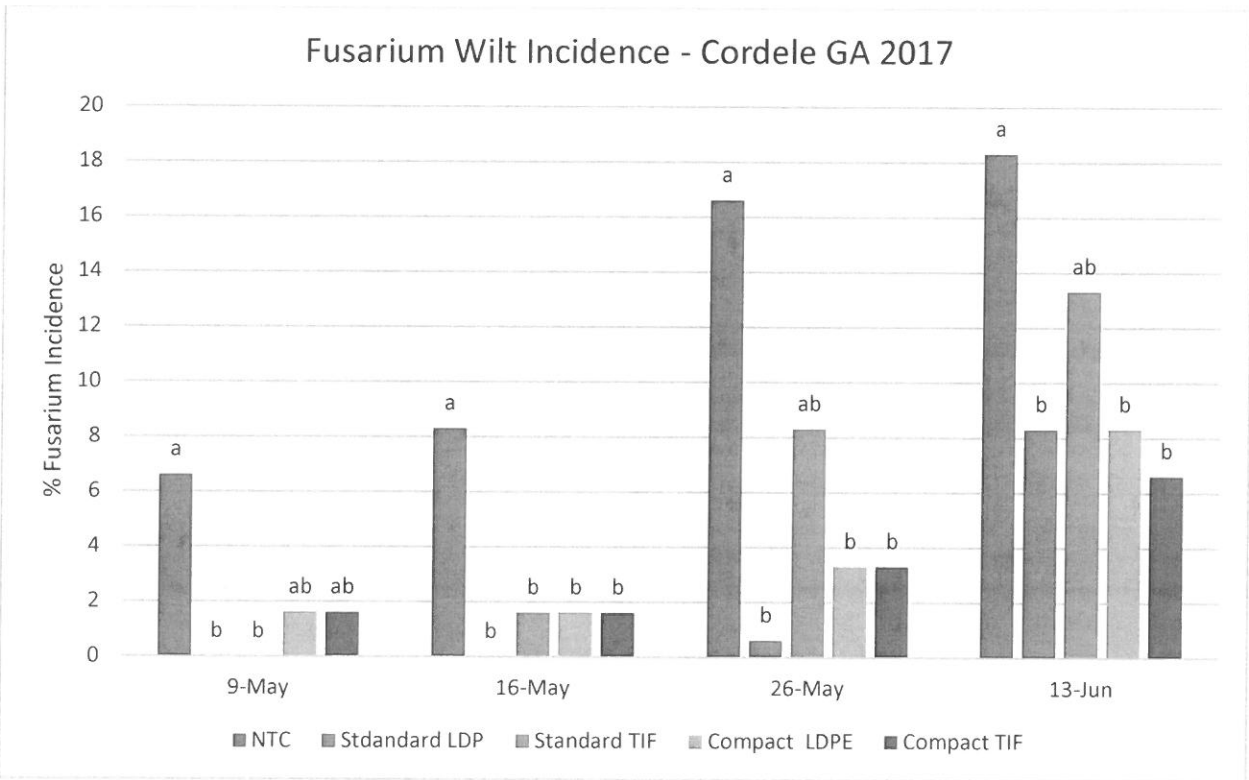
Principal Investigator: Josh Freeman. Associate Professor of Horticulture. University of Florida, North Florida Research and Education Center. Email: joshuafr@ufl.edu. Phone: 850-875-7128.

Project Summary: Our project investigated the use of chloropicrin using standard (8" tall x 30" wide) and reduced bed geometry (10" tall x 15" wide) with highly retentive plastic mulch. Reduced bed geometry refers to narrower, taller plasticulture beds. This bed size can greatly reduce the amount of fumigant used which would reduce input costs and make the practice more adoptable by producers. The taller bed is also designed to keep the fumigant in the soil longer, hopefully improving efficacy. Highly retentive plastic films such as totally impermeable film have also been implemented to reduce fumigant use by as much as 50%.

Experimental Methods: This research was conducted in two locations. Chiefland, Florida and Cordele, Georgia. The Chiefland location consisted of ten experimental treatments and the Cordele location had five treatments. The treatments are listed below. Experimental plots were established in Chiefland on February 23rd and in Cordele on March 8. Seedless watermelon plants were established at both locations and visual ratings of Fusarium incidence were taken on three dates in Chiefland and on four dates in Cordele. Unfortunately yield was not taken at either research site. Because of the proximity of both sites we relied on local personnel to manage the crop in both locations and unfortunately management intensity was not sufficient to successfully finish the crop.

Summary of Findings: The Cordele location provided promising results in which Fusarium wilt incidence was significantly reduced by fumigation treatments. The least disease incidence was in compact beds covered with totally impermeable film (TIF). All fumigation treatments tested at Cordele reduced Fusarium wilt incidence compared to the non-treated control and the standard bed size did not improve Fusarium control compared to the compact bed. Unfortunately, in Chiefland the results were highly variable and overall inconsistent. Early ratings showed a trend in which Fusarium wilt was reduced by using chloropicrin and increasing chloropicrin use rate but these results were not statistically significant. Though the results of these experiments were variable, I believe there that this strategy has merit for managing Fusarium wilt of watermelon. The cost of using chloropicrin in a standard bed configuration would be around \$250 per acre and around \$125 per acre with the compact beds. This strategy would also provide control of nutsedge and nematodes, both of which are problematic for watermelon producers. When this strategy is compared to over \$1000 per acre to manage Fusarium wilt with grafted plants it seems very positive. Because of the positive nature of these results I will be investing in an improved fumigation rig to deploy fumigants into compact beds and will be conducting research in 2018 on-farm and on a research station. I will be providing those results to the National Watermelon Association and to growers because of this initial grant.

2017 Fusarium Wilt Fumigation Treatments	
Cordele, GA	Chiefland, FL
Non-treated standard bed	Non-treated compact bed
Compact bed 300 lb/acre Pic 100 under LDPE	Compact bed 150 lb/acre Pic 100 under LDPE
Compact bed 300 lb/acre Pic 100 under TIF	Compact bed 300 lb/acre Pic 100 under LDPE
Standard bed 300 lb/acre Pic 100 under LDPE	Compact bed 150 lb/acre Pic 100 under TIF
Standard bed 300 lb/acre Pic 100 under TIF	Compact bed 300 lb/acre Pic 100 under TIF
	Non-treated standard bed
	Standard bed 150 lb/acre Pic 100 under LDPE
	Standard bed 300 lb/acre Pic 100 under LDPE
	Standard bed 150 lb/acre Pic 100 under TIF
	Standard bed 300 lb/acre Pic 100 under TIF



Fusarium Wilt Incidence - Chiefland FL 2017

