USE OF INTEGRATE TO IMPROVE THE LATERAL MOVEMENT OF DRIP-APPLIED ITC GENERATORS FOR TOMATO PRODUCTION

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Purple and yellow nutsedge (Cyperus rotundus and Cyperus esculentus) are two troublesome weeds in tomato production. Previous research demonstrated that high nutsedge populations can reduce tomato yield by 51%. Many of the drip applied methyl bromide alternatives have shown to be less effective controlling purple nutsedge. The majority of thriving nutsedge tubers derive from the under fumigated bed edges. This is mainly due to the inability of drip applied fumigants to extend laterally across beds in Florida's deep sandy soils. Consequently, as these fumigants break down into a weak gas they become less effective.

Spring 2014

A series of studies were conducted at the Gulf Coast REC beginning in Spring 2013 to compare ITC generators and determine the benefit of a soil surfactant to improve drip-applied fumigants for the control of nutsedge. Only the trial from Spring 2014 will be discussed. The treatments consisted of 1) Metam potassium (Sectagon K-54, 60 gal/Treated A), 2) IRF-135 (AIT) (Dominus, 40 gal/Treated A) 3) Dazitol 12.5 gal/acre , 4) Metam potassium + Integrate (1 gal/Treated A) 5) IRF-135 + Integrate (1 gal/Treated A) 6) Dazitol 12.5 gal/acre + Integrate, 7) Integrate and 8) non-treated control. One drip tape containing 1 ft between emitters (0.45 gal/100ft/min) and black VIF mulch was applied over all treatments using a speedroller. Beds were 28 in wide on top and 32 in at base. Surfactant treatments were applied to plastic covered raised beds through a hydraulic injector and fumigants through an Ag Sprayer pump using single drip tape, with Integrate being injected one day before all drip fumigant applications. This trial was set up as a randomized complete block with split-plot design and six replications per treatment.

Results

The initial nutsedge population in each plot before fumigation was fairly uniform and high with an average of 20 shoots/m^2. The addition of the surfactant application prior to the three ITC generators did not increase purple nutsedge control at two or six weeks after treatment (WAT). Metam potassium and AIT treatments performed statistically better than the Dazitol and the non-treated control treatments at 2 WAT (Figure 1). However, AIT was similar to Dazitol and the non-treated control at 6 WAT (Figure 2). At 6 WAT, metam potassium alone had the lowest nutsedge population with 19 shoots/m^2. There was no difference in tomato yield for any of the treatments but this may be due to the weather during the season which led to abnormally low fruit set for all plants (Data not shown). In general, Dazitol was completely ineffective against nutsedge.

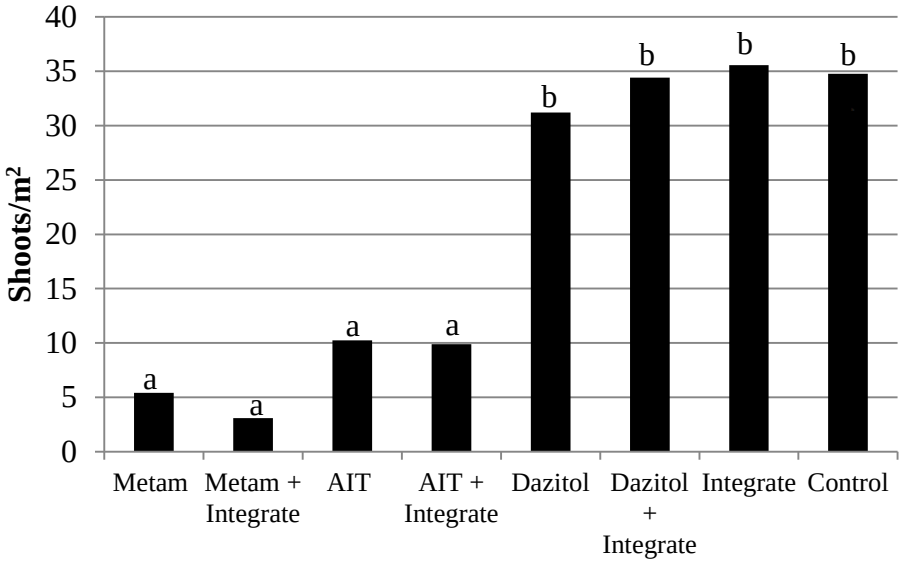

Figure 1. The effect of a surfactant applied one day before fumigant injection on nutsedge population at 2WAT in Tomato. Letters above bars indicate statistical significance ($\alpha = 0.05$).

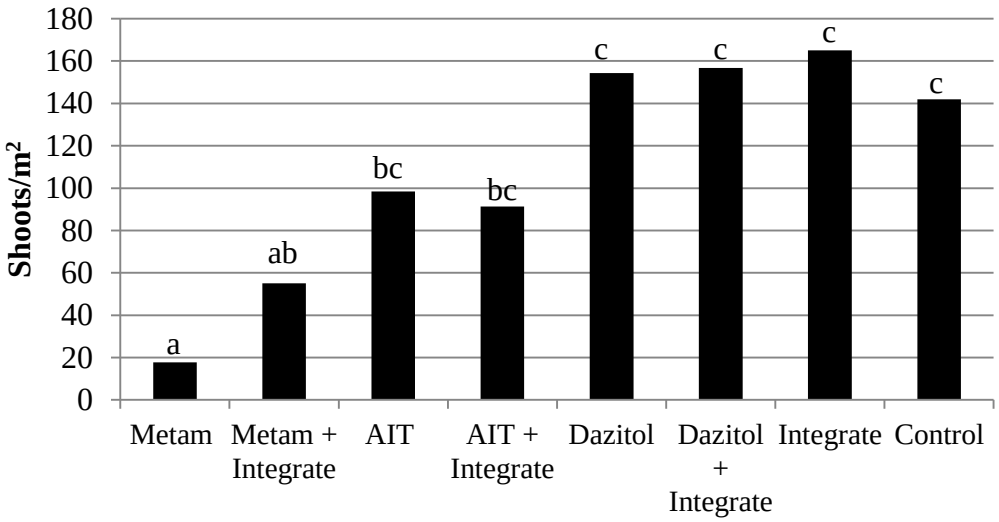

Figure 2. The effect of a surfactant applied one day before fumigant injection on nutsedge population at 6WAT in Tomato. Letters above bars indicate statistical significance ($\alpha = 0.05$).