OUTREACH AND NEW APPROACHES FOR METHYL BROMIDE ALTERNATIVES THROUGH THE USDA AREAWIDE PROJECT

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This year we have continued our outreach activites through grower commodity conferences, field days, and small community meetings. In addition to traditional research-based grower and extension activities, an effort was made to enhance proper usage of fumigant equipment and personal protective equipment. For example, training sessions were coordinated at the 2010 Southeast Strawberry Expo (Virginia Beach, VA) to discuss Methyl Bromide alternatives, fumigant regulation, and fit-testing and respirator use certification. Through the past year we have presented methyl bromide alternative research at several large grower meetings including the Southeast Vegetable Expo (Myrtle Beach, SC), Mid-Atlantic Fruit and Vegetable Conference (Hershey, PA), and the North Carolina Vegetable Growers Association Meeting (Asheville, NC). Additionally, several presentations were made during preplant meetings that were coordinated by regional and county-based extension personnel in North Carolina and South Carolina. We also contributed to a Strawberry Fumigation Field Day (Lexingtion, SC) and the Vegetable Field Day in Mills River, NC. During these presentations, alternative fumigant options, equipment modifications, and upcoming regulatory issues were discussed.

One product that was new to our research program this year was a newly-available mulch known as Totally Impermeable Film (TIF). TIF acts as a complete barrier to fumigant movement. This has the potential to reduce fumigant use rates even further than Virtually Impermeable Films (VIF) that have become popular in recent years. We conducted 2 trials with the TIF mulch at commercial farm locations in North Carolina. The first was a pepper experiment that was located in the central part of the state and the second trial was in the western part of the state with a tomato crop. At both locations, PicClor 60 was used at broadcast rates of 260 lbs/A, 195 lbs/A, 130 lbs/A and 65 lbs/A compared to non-fumigated areas and plots that were fumigated with methyl bromide. These trials are currently ongoing and the results of will be discussed during the presentation. We are optimistic about large rate reductions with this new product and hope to conduct more evaluations next year.

We also expanded our efforts to understand the relevance of grafting with resistant and/or tolerant rootstocks as an alternative to soil fumigants for the purpose of managing soilborne diseases. In western NC, methyl bromide is widely used to manage verticillium wilt, caused by a fungal plant pathogen, *Verticillium dahliae* (race 2). Trials were conducted at a commercial on-farm location in 2009 and 2010 that investigated the ability of rootstocks to tolerate infection by *V. dahliae* (race 2). In 2009, grafted and non-grafted plants were grown in non-fumigated rows and we saw preliminary evidence that ‘Maxifort’

rootstock may be providing tolerance to verticillium wilt. As with previous studies in NC, verticillium wilt incidence (# of infected plants) of grafted plants was similar to the nongrafted ones. However, yield increases were evident when 'Maxifort' rootstock was used even when the grafted plants were grown at reduced in-row spacings (Fig.1A). Furthermore, the severity of the disease was reduced among the grafted plants (Fig 1B) and the grafted plants showed fewer symptoms of verticillium wilt. In 2010, the trial was expanded to include other rootstocks as well as nongrafted plants grown in fumigated rows so that we could make pairwise comparisons between fumigated (nongrafted) and non-fumigated (grafted) treatments (harvest in progress at press time). Additionally, the collaborating grower was able to successfully produce approximately 2000 grafted plants as a result of an on-farm grafting demonstration and on-farm visits with university personnel during the early spring.

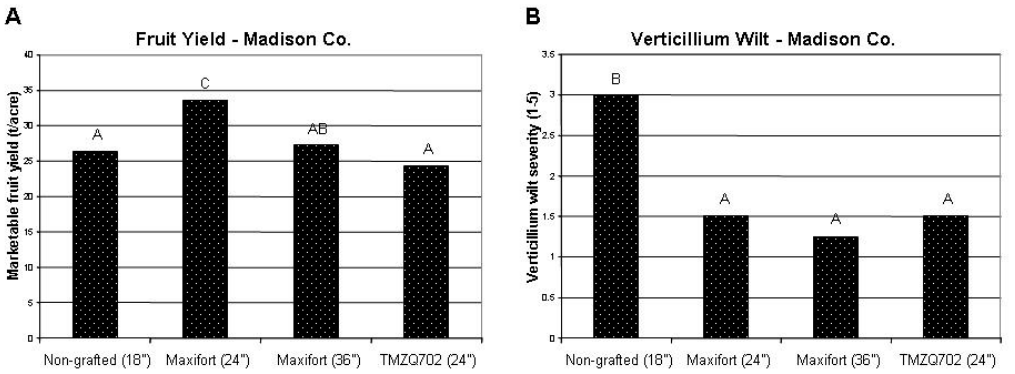

Figure 1 – Marketable fruit yield **(A)** and Verticillium wilt severity **(B)** of grafted and non-grafted 'Florida 47' at the Madison County Location. Verticillium wilt severity was rated on a 1-5 visual scale. Treatments with the same letter are not significantly different at $P = 0.05$.