those of PI582438 were fully green after two weeks of salt stress. In addition, a highly salt-tolerant genotype, PI349674, was identified. Relative salt tolerance for chlorophyll content was highly correlated with number of dead plants and leaf injury scores (r = –0.77 and r = –0.79, respectively), indicating that the higher the number of dead plants were, the lower relative salt tolerance for chlorophyll content and leaf injury scores were. Relative salt tolerance for leaf biomass was moderately correlated with number of dead plants and leaf injury scores (r = –0.46 and r = 0.50, respectively), whereas relative salt tolerance in plant height was poorly correlated with number of dead plants and leaf injury scores (r = 0.11 and r = 0.17, respectively). Therefore, number of dead plants per pot, chlorophyll content, and leaf injury scores were good criteria for salt tolerance evaluation in cowpea. This study provided a rapid methodology and suggested simple criteria to evaluate salt tolerance at seedling in cowpea.

Thirst Quenching: Improving Tomato Water Use Efficiency through Grafting

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The following study was conducted to address water use efficiency in grafted tomatoes in a real-world, on-farm environment. The commercial rootstocks Beaufort and Shield were chosen as these two have different root system morphologies that may benefit water use efficiency. The heirloom cultivar Cherokee Purple was grafted onto both rootstocks as well as utilized as the non-grafted control. The study was conducted in 2016 and 2017 on a sustainable five-acre vegetable and cut flower farm in North Carolina's Piedmont region. Plants were grown under protected, high-tunnel culture where they received either 100% (3 h every other day) or 50% (1.5 h every other day) of the grower's normal irrigation regime. The 'Beaufort' grafted plants significantly improved irrigation water use efficiency (iWUE) at the 50% irrigation treatment compared to the other rootstock treatments. Furthermore, at 50% irrigation, 'Beaufort'-grafted plants yielded significantly more than all other rootstock treatments at 50% irrigation as well as the non-grafted 'Cherokee Purple' receiving the 100% irrigation treatment. Regardless of irrigation treatment, grafting onto 'Beaufort' improved the quality of total fruit harvested. An economic assessment was conducted to determine the feasibility of utilizing grafted plants in conditions lacking significant disease pressure. Purchasing grafted transplants would increase the initial investment by $60.30/100 ft. However, the increased yield obtained when utilizing the 'Beaufort' rootstock at 50% irrigation increased net revenue by $596.75/100 ft compared to non-grafted 'Cherokee Purple' receiving 100% irrigation. This amounts to an 80.7% increase in net revenue while saving approximately 4350 gallons/100 ft. Grafting tomatoes onto disease resistant rootstocks has already proven to be an effective means to manage soilborne diseases. These results indicate that growers can select rootstocks to better manage water use in an environmentally friendly manner without limiting economic gains.

Evaluation of Commercially Available Varieties of Yellow Squash and Zucchini for Tolerance to *Cucurbit leaf crumple virus* in Georgia

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The *Cucurbit leaf crumple virus* (CuLCrV) has become a significant obstacle for fall production of *Cucurbit spp*. in southern Georgia. Vectored by sweetpotato whitefly (*Bemisia tabaci*) biotype B, this virus can cause significant losses in yellow and zucchini squash (*Cucurbita pepo*). Due to high populations of the virus vector during the fall growing season, virus transmission has not been able to be controlled by insecticide applications. Ultimately, resistance or tolerance to CuLCrV in commercially-available varieties will be the primary mechanism to manage this virus in Georgia. In Fall 2017, a study was initiated to evaluate 20 varieties of yellow and zucchini squash for resistance or tolerance to this virus. The study was arranged in a randomized complete block design with three replications of each variety. Each plot contained 15 plants. Plants were evaluated for virus incidence, severity of infection, vigor, and yield. All plots demonstrated 100% virus incidence within 35 days of planting. Yellow squash had a higher virus severity and lower vigor overall than zucchini squash. Yields of two yellow varieties, Lioness and Grand Prize, were significantly greater than all other yellow varieties, but were approximately one-tenth of what would be commercially acceptable for fall production in Georgia. The variety SV6009 had the highest numeric yield for zucchini, with 1630 boxes/ha, although this was not significantly different than four other varieties. While yields of some zucchini were approximately one-half of what is typically observed in Georgia in fall production, they may be high enough to warrant planting if market prices are elevated. Comparison of main effects indicated that average zucchini yields were 1014 boxes/ha compared to 124 boxes/ha for yellow squash infected with CuLCrV.

Evaluation of Spinach (*Spinacia oleracea* L.) Germplasm for Use In Hydroponic Production

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Seeds of twelve commercial spinach cultivars and eleven spinach germplasm selections were evaluated for suitability for hydroponic NFT (nutrient film technique) production. Spinach germplasm were germinated in a hydroponic propagation system