

occurred with decreasing nitrogen rates in both cultivars. A stronger genotype**nitrogen treatment* interaction was observed in ‘TropicBeauty’ for TPC, TFC, and TAC. Overall, our data suggests nitrogen rate and harvest time plays an important role in harvested fruit attributes and therefore, can be strategically manipulated to satisfy consumer demand.

Specified Source(s) of Funding: UF/IFAS Early Career Scientist Grant Program

(372) Aging of Coir Dust Root Substrate Can Eliminate Its Influence on Vegetable Seedling Growth Suppression As a Result of Reduced Phenolic Compounds

Jong-Myung Choi

Chungnam National University, Daejeon, Korea, Republic of

Jwa Kyung Sung

RDA, Wanju, Korea, Republic of

Nu Ri Lee

Chungnam National University, Daejeon, Korea, Republic of

Chiwon W. Lee*

North Dakota State University, Fargo, ND

This research was conducted to characterize the vegetable seedling plug growth suppression caused by non-aged coir dust root substrate and the pattern of remedying the growth suppression after aging treatment. The growth suppression for tomato, pepper and Napa cabbage seedlings 3–4 weeks after sowing on non-aged coir dust was compared with that of the plants grown with aged coir dust. The reduction of polyphenol concentration in the coir dust during the 6 months aging process was also investigated. For aging treatment, coir dust was drenched with water daily inside a plastic covered greenhouse. Plant height, stem diameter and above ground fresh weight of tomato seedlings grown with aged coir dust were 12.1 cm, 2.21 mm, and 0.67 g, respectively, as compared to 8.5 cm, 1.51 mm, and 0.34 g for non-aged coir dust. Plant height, stem diameter, above-ground plant weight of pepper seedlings grown with aged coir dust were 8.3 cm, 1.4 mm, 0.35 g, respectively, compared to 6.5 cm, 1.12 mm, and 0.25 g for non-aged coir dust. The leaf length, number of leaves and above-ground plant weight of Napa cabbage seedlings grown on aged coir dust for 3 weeks were 4.45 cm, 5.2, and 0.94 g, respectively, as compared to 3.75 cm, 4.7, and 0.53 g for seedlings grown with non-aged coir dust. In general, plants grown with non-aged coir dust showed 51% to 71% reduction in fresh weights compared to those grown with aged coir dust. Ethanol extracts of non-aged coir dust contained 38.8 mg/g polyphenol (determined by tannin standard, Folin-Dennis assay), 168.6 mg/g tannin (vanillin assay), and 0.21 mg/g flavonoid (determined by quercetin standard). The concentrations of these phytochemicals started to drop drastically after two weeks of aging, with their final concentrations lower than those obtained from the commercial coir root substrates sold for seedling production when determined after 6 months of aging treatment.

(373) Growth Response of Kale ‘Ripbor’ to Different Growing Medium Conditioners

Lord Abbey

Dalhousie University Faculty of Agriculture, Truro, NS, Canada

Samuel K. Asiedu*

Dalhousie University Faculty of Agriculture, Truro, NS, Canada

Ekene M. Iheshiulo

Dalhousie University Faculty of Agriculture, Truro, NS, Canada

Kale (*Brassica oleracea* L. subsp. *acephala*) is considered a high-value crop based on its phytochemicals and health benefits. Consumers’ demand for organic and high-value natural foods is increasing due to increasing food safety and environmental concerns. A pot experiment was carried out to determine the response of kale ‘Ripbor’ plants to K-humate (47.5 g/pot), volcanic minerals (100 g/pot) and dry vermicasts (50 g/pot). The control treatment was Pro-mix BX™ potting mix alone. Only the pH of the dry vermicasts was within the acceptable limits for most plant between 5.7–7.5. The relative growth rates of plants grown in the dry vermicasts (192 mg dry weight/day) was significantly ($P < 0.05$) the highest as compared to approximately 600 mg dry weight/day for plants grown in either the K-humate or volcanic mineral amended medium. Total plant fresh weight yield did not significantly ($P > 0.05$) differ among the three treatments. The dry vermicasts significantly ($P < 0.05$) reduced leaf and stem mass densities by more than 30% as compared to the mean densities for the other three treatments including the control treatment. Additionally, leaf dry-matter content was increased by 29% in the K humate, volcanic minerals or Pro-mix BX™ as compared to the dry vermicasts. Leaf tissue N and protein contents were 43% higher in plants grown in the dry vermicasts than in the other treatments. The N and protein contents of the control plants were the least. The results suggested that the dry vermicasts provided suitable growing medium conditions, which led to higher growth response of the kale plants as compared to the volcanic minerals and the K-humate treatments.

(374) On-farm Evaluation of Six Commercially Available Biofertilizers on Organic Tomato and Broccoli

Julie Laudick*

The Ohio State University-OARDC, Wooster, OH

Zheng Wang

The Ohio State University-OARDC, Wooster, OH

Matthew Kleinhenz

The Ohio State University-OARDC, Wooster, OH

Biofertilizers contain microorganisms that promote plant growth by one or more mechanisms, including increasing nutrient supply and/or availability. Native soil microorganisms clearly play critical roles in crop and soil health, and a growing body of evidence suggests that inoculation with specific microorganisms can dramatically affect plant growth in controlled environments. The purpose of this study was to test the effects of biofertilizers in a variety of production environments involving on-station

An asterisk (*) following a name indicates the presenting author.

and on-farm plots and high and low fertility conditions. Four commercially available inoculants (*Azospirillum brasilense*, *Pseudomonas protogens*, *Bacillus amyloliquefaciens*, and a 29-strain mix) and a control were applied to newly-transplanted tomato seedlings at four Ohio organic farms and a field station at OARDC in Wooster, Ohio, in 2015, followed by assessments of plant growth and measures of fruit yield. Slight increases in early season growth, fruiting, and flowering were observed for some inoculants on several farms. However, these differences did not lead to significant or even numerically consistent yield increases. A second experiment was conducted on broccoli at a farm in Fremont, Ohio in Fall 2015 to test the combined effects of nitrogen fixing inoculants and fertilizers. Four inoculants (*Azospirillum brasilense*, *Azotobacter spp.*, a 12-strain mix, and a 29-strain mix) and a control were tested in a full factorial design with two organic fertilizers (composted chicken manure, and a mixed fertilizer), and an unfertilized control. Yield was lowest in plots receiving neither fertilizers nor inoculants, highest in the plots receiving fertilizers, and intermediate in plots that were inoculated, but not fertilized. No additive effects of inoculation and fertilization were observed. Both fertilizers significantly ($P < 0.05$) increased yield compared to the control. When no fertilizer was added, the inoculants increased yield by 12.9% to 64.6%, with the only the best performing biofertilizer resulting in a significant yield increase over the control. Biofertilizers are only a fraction of the cost of organic fertilizers, so their potential return on investment is high. However, their performance is clearly context-dependent, and conditions under which they perform most consistently are not well understood. In this study, no effects of inoculation were observed under high fertility conditions, suggesting that biofertilizers may have the greatest potential in low-input systems.

(375) Yield of *Porophyllum ruderale* Jacq. As a Function of the Concentration of Nutrient Solution

Porfirio Juarez-Lopez*

Universidad Autonoma del Estado de Morelos, Cuernavaca, Morelos, Mexico

Jesús A. Martinez Valdepeña

Universidad Autonoma del Estado de Morelos, Cuernavaca, Morelos, Mexico

Iran Alia-Tejagal

Universidad Autónoma del Estado de Morelos, Cuernavaca, Morelos, Mexico

Victor Lopez-Martinez

Universidad Autónoma del Estado de Morelos, Cuernavaca, Morelos, Mexico

Gelacio Alejo-Santiago

Universidad Autonoma de Nayarit, Xalisco, Nayarit, Mexico

Manuel Sandoval-Villa

Colegio de Postgraduados, Montecillo, Estado de Mexico, Mexico

Rosendo Balois-Morales

Universidad Autónoma de Nayarit, Tepic, Nayarit, Mexico

In 2014, 355 hectares of *Porophyllum ruderale* were harvested. Recently, this leafy vegetable has gained importance due to its nutraceutical properties. However, scarce information is available regarding its mineral nutrition. The objective was to evaluate the effect of four concentrations of the Steiner nutrient solution (1.0, 1.5, 2.0, and 2.5 dS·m⁻¹) on the yield of *P. ruderale*. The experiment was set up in a greenhouse with plastic cover located at 18°58'51"NL; 99°13'55"WL and a height of 1866 m; in Cuernavaca, Morelos, Mexico. The substrate was mix BM2 Berger® and 6-inch pots were used. The sowing was done on 25 May 2015. The yield (fresh weight of aerial biomass) 53 days after sowing was evaluated. With 1.5 dS·m⁻¹ of Steiner nutrient solution the highest yield per plant (66.4 g) was obtained.

Specified Source(s) of Funding: Fondo Mixto Morelos-Conacyt Clave: MOR-2013-C01-224912

(376) Influences of Land Use with Different Crops on Soil Fertility and Productivity in the Area Above the Three Gorges Reservoir of China

Li Ma*

University of Florida, Homestead, FL

Qingren Wang

University of Florida/IFAS Miami-Dade Extension, Homestead, FL

Yuncong Li

University of Florida, Homestead, FL

Groundwater level rising after the Three-Gorges-Dam built in China may create a potential impact on soil fertility, land productivity and the development of sustainable agriculture in the area above the Three-Gorges-Reservoir (TGR). A comprehensive survey was conducted in 2009 through 3 counties (Zigui, Xingshan, and Badong) to evaluate the soil fertility, land productivity and economic output from different land uses including cereal/vegetable crops, citrus, and tea crop at various altitudes in the agricultural area above the TGR. The results showed that the soil fertility in cereal/vegetable crop fields on average had soil organic matter (SOM) 15.32 g/kg, total nitrogen (TN) 1.11 g/kg, total phosphorus (TP) 0.62 g/kg and total potassium (TK) 17.10 g/kg, respectively; followed by citrus (SOM 12.97 g/kg, TN 1.02 g/kg, TP 0.60 g/kg and TK 19.21 g/kg), and tea crop (SOM 9.44 g/kg, TN 0.70 g/kg, TP 0.57 g/kg and TK 10.04 g/kg). Regarding the productivity, cereal/vegetable crops had a decrease after water filled up in the TGR, especially in Zigui County, but citrus remained a stable increase in these three counties. However, the economic benefit of citrus industry was significantly greater than those of tea and other crops, which stimulated the citrus acreage and remained the economic output increase in all these three counties. The soil fertility was closely related to the elevation and land use. For instance, the land at altitude 600–700 m with citrus growing had SOM 25.47 g/kg, TN 1.42 g/kg, TP 0.50 g/kg and TK 16.4 g/kg; and the land at altitude 700–900 m with cereal/vegetable crops had SOM 15.73 g/kg, TN 1.04 g/kg, TP 0.70 g/kg, and TK 19.54 g/kg. A change from slope to terrace farming helped

An asterisk (*) following a name indicates the presenting author.