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Soil and Water Sciences Graduate Student Exit Seminar

Speaker: **Eunice Yarney**
Ph.D. Degree Candidate

Advisor: Dr. Mark Clark

Title: **Temporal and Spatial Variability of Irrigation Water Salinity and Effects of Irrigation Practices on Soil Salinity in the Tri-County Agricultural Area, Northeast Florida**

Date: Monday, October 31st

Time: 3:00 pm – 4:00 pm

Location: McCarty Hall D, G001

Irrigation water salinity has been an issue of concern for growers in the Tri-County Agricultural Area (TCAA) for many years. This becomes most apparent during low rainfall years when salts can concentrate in the soil due to increased evaporation and reduced leaching, coupled with increased irrigation. Another issue in the TCAA relates to nutrient runoff and water quality impairment in the Lower St. Johns River. As part of multiple efforts to reduce water use and nutrient loading to the Lower St. Johns River, alternative irrigation practices, including Irrigation Drainage Tile (IDT) are currently being evaluated in the TCAA. IDT systems have been hypothesized to reduce salinity in soils due to their drainage capabilities and water use efficiency. This research was conducted to evaluate (1) temporal and spatial trends in groundwater salinity over the past 40 years, and (2) evaluate the potential of IDTs to reduce soil salinity, compared with conventional seepage irrigation (SI). To assess spatial and temporal trends, groundwater from 134 irrigation and household wells in the TCAA was collected monthly or quarterly in 2013-2015 and compared to a groundwater salinity survey conducted by the St. Johns River Water Management District in 1975/1976. To evaluate the effect of IDT on soil salinity, soil samples were collected from SI and IDT fields in six farms between 2013 and 2015. For both SI and IDT fields, soil samples were collected at three distances from a reference water furrow or IDT pipe and at each sampling location, 30cm composite samples were collected from four sampling depths below the surface. This was replicated at three different zones in the field representing areas of water inflow, outflow, and center of field. Electrical Conductivity (EC, dS/m) was measured as an estimate of ground and soil water salinity. Results indicated that in the long-term, groundwater salinity has mostly increased over the past 40 years; however, in the short-term (2013-2015), many wells have seen a decreasing trend in salinity. Results for soil salinity indicated that IDT field soils were significantly lower in salinity than SI fields in four out of six farms, in at least one of the three sampling events. In conclusion, groundwater salinity trends are influenced by several factors including rainfall. IDTs have the potential to significantly lower soil salinity compared with SI systems especially post-concentration periods like low rainfall or drought conditions.

For our off-campus students, off-campus faculty, and on-campus students who cannot attend, this seminar can be viewed via live this link: Eunice Yarney. In addition, all seminars are archived for viewing at http://soils.ifas.ufl.edu/academics/seminars.shtml