

75th Anniversary
History of the
West Florida Research
and Education Center
1947 to 2022



History of the West Florida Research and Education Center, Jay FL 1947-2022

The West Florida Research and Education Center was established in 1947 as the West Florida Experiment Station (WFES). The name of the branch station was changed several times over the years. Originally listed as the West Florida Experiment Station, the name was changed to Agricultural Research Center, then to Agricultural Research and Education Center, and eventually to the present name West Florida Research and Education Center (WFREC).

Due to the distance from the western panhandle region of Florida to the main campus in Gainesville, only a limited amount of information had been gathered about soil fertility requirements and crop adaptations for the soils in west Florida by the 1940's. The North Florida Experiment Station at Quincy (now the North Florida Research and Education Center) had established a mobile research unit for work in the panhandle and one research scientist, **Mr. Ralph Smith**, was assigned to that mobile unit.

Mr. Smith, who was eventually assigned as an agronomist at the WFES, conducted research in cooperation with farmers in Walton, Okaloosa, Santa Rosa, and Escambia counties to determine soil fertility requirements and plant adaptation to the area. Mr. Smith was able to show growers some of the agricultural potential of the area and this no doubt played an important role in generating interest among local farmers and business owners in having an experiment station established in the western panhandle region.

The WFES was authorized by the Florida Legislature in 1943. The statute authorizing the branch station stated that it was to be located either in Santa Rosa or Okaloosa County for the purpose of research on field crops (including pastures and vegetables) and livestock. The 1945 Florida Legislature allocated \$25,000 to purchase land for the branch station.

With the aid and recommendation of a local citizens committee, an exhaustive survey of available locations led to the selection of a site for the branch station midway between Milton and Jay. In August of 1946, the Florida Pulp and Paper Company agreed to sell 640 acres of land to the Florida Agricultural Experiment Station (FAES) for \$17,800. The paper company retained half the oil and mineral rights and the right to harvest all the pine timber and pulp from the site. The sale closed and the land was turned over to the FAES.

The station was initially allocated three agronomist positions. In 1947, **H. W. (Dick) Lundy** was hired as an Agronomist and during 1947-48 supervised the clearing of approximately 300 acres of remaining vegetation and stumps. The first field experiments were initiated in 1948. A comprehensive soil survey of the branch station tract was completed in 1948 and a detailed soil map was prepared by personnel of the Soils Department in Gainesville.



Dr. Curtis E. Hutton, first director of the West Florida

On June 1, 1949, **Dr. Curtis Hutton** was named as Agronomist and Head of the WFES. Dr. Hutton conducted soil chemistry research in addition to serving as head of the station.

Initial research at the WFES involved determining soil fertility requirements for all major crops. Native soils were found to be low in phosphorus and nitrogen and most crops responded to the application of calcium. Other early research at the station identified cultivars of corn, peanuts, soybeans, grain sorghum, small grains, and forages that were adapted to soil and climactic conditions of northwest Florida. Research was also conducted to determine the optimum time of planting and plant densities for the various crops grown in the region.

In the late 40's and early 50's the WFES was utilized to produce foundation seed of peanut, oat soybean and bahiagrass cultivars. This seed increase was the beginning of the Foundation Seed Program in Florida.

Prior to 1950, most pastures were unfertilized native grass species or were improved grass species grown with minimal inputs. Research conducted at WFES demonstrated that new cultivars of bahiagrass and bermudagrass provided excellent summer forage when planted on suitable soils and grown with proper fertility. Researchers at WFES conducted much of the early work with Pensacola bahiagrass and showed it to be equal to or superior to other forages grown in the region at that time. In addition, some cool-season forages were found to be adapted to winter conditions in the Florida panhandle. This research showed growers that with a suitable fertility program, ample green forage could be produced on a year-round basis.

Although there was no horticulturist assigned to the station, variety trials of peaches, pears, plums, muscadines, blueberries, pecans, figs, persimmons, youngberries, boysenberries, blackberries, potatoes, cabbage, cauliflower, broccoli, watermelon and tung nuts were conducted beginning in 1948. Several varieties of each of these horticultural crops were identified as suitable for home fruit and vegetable production, and in some instances, for commercial production. In addition to variety testing, research was conducted to determine appropriate fertility as well as insect and disease management programs so that homeowners could enjoy these horticultural crops.

Dr. W. R. Langford was hired as Assistant Agronomist in 1951 and immediately expanded the research on pasture plants and pasture management including legumes in the permanent pasture mixture. He also initiated research to determine the rates and timing of fertilizer application required to maintain the legumes in a permanent pasture.

Beginning in 1952, the WFES participated in the release of several soybean cultivars adapted to the West Florida area. Dr. Langford was replaced by **Dr. R. L. Jeffers** in 1953. Dr. Jeffers continued the research in pastures and pasture management. In addition, he initiated research on sulfur requirement of various crops grown on the representative soils of this area.

In 1955, new research was initiated on the water requirement of corn, cotton, peanut, and soybean. An eight-inch well was completed to supply water needed for irrigation. In the same year, a new office building was completed.

In 1956, **Dr. Monroe Lutrick** was hired as Assistant Agronomist, Soils Chemist. Dr. Lutrick took on the responsibility for soil management investigations in all field crops and pastures. He was also responsible for the evaluation of miscellaneous fruits and nuts including pecans, muscadines, apples, nectarines, Chinese chestnuts, blackberries, peaches, plums, and cultivar trials of peanut, cotton, soybean, corn, and grain sorghum. In addition, he began rotation studies with the various field crops. During the early 60's, research was initiated on growing tomatoes hydroponically in a plastic greenhouse. Yields were over 100,000 pounds per acre of greenhouse space from two cultivars that appeared suitable for greenhouse production in West Florida.

Mr. Ralph Smith was transferred from the Pensacola Mobile Unit to the West Florida Experiment Station in 1957 and assumed part of the responsibility for research on field crops and pastures, and initiated research on weed control in peanuts in 1958. Research on weed management in corn, soybeans, and grain sorghum followed shortly thereafter.



*Dr. Leonard Dunavin, Agronomist
and Dr. Monroe Lutrick, Soil Chemist*

Dr. Leonard Dunavin replaced Dr. Jeffers in 1959 and he assumed responsibility for research on pasture plants and pasture management, and initiated research on plants suitable for silage. In the 90's, the WFREC participated in the release of several ryegrass cultivars in cooperation with the University of Florida Agronomy Department partly because of the testing done in this area. Management programs for year-round grazing systems were devised over a period of years and were widely adopted by the cattle producers in the West Florida area.

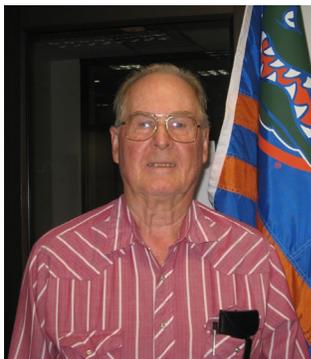


*Dr. Joseph Bertrand, Animal
Scientist and Dr. Leonard
Dunavin, Agronomist*

Dr. Joseph Bertrand was hired as Associate Animal Scientist in 1966 and initiated research on the growing of stocker beef calves and finishing cattle by dry lot feeding of economical high-energy fattening rations, and dry lot feeding of high-moisture grain and silage. This research resulted in the calves born on farms in West Florida being retained to feeder cattle weights rather than being sold at stocker weights. He also devised programs to make maximum use of winter grazing in the overall management of beef cattle in this area.

Research was initiated in 1974 to determine application rates of liquid digested sludge (from the Pensacola waste treatment facility) for optimum corn, soybean and grain sorghum production. This was a cooperative effort between the Animal Science Department in Gainesville, the Animal Scientist at WFREC, the Soils Department in Gainesville, the Soils Scientist at WFREC, and the Pasture Management Agronomist at WFREC. Because of the work initiated at WFREC, the Soils Department of the University of Florida applied for and received a grant of over \$2 million from the EPA to study the effects of spreading liquid digested sludge on agricultural soils and the effect on cattle grazing the treated areas.

Dr. Robert Kinloch joined the faculty as Assistant Nematologist in 1969 to study problems associated with several species of nematodes which attacked many of the major field crops in the Florida panhandle. Many nematicides were tested and some were found to be highly effective against the root knot nematode of peanut and soybean. This information was used to register several effective nematicides for use in several cropping systems. Eventually several nematicides became unavailable to growers due to stricter registration requirements. In an effort to find alternative management system Dr. Kinloch, in cooperation with the soybean breeder in Gainesville, began a project to evaluate thousands of soybean breeding lines for genetic resistance to root knot nematode and soybean cyst nematode. From these thousands of evaluations, one breeding line showed more genetic resistance to soybean cyst nematode than any other and was eventually released as the cultivar, Centennial. After Centennial was released in the 80's, it was planted to more acreage in the southeast than any other soybean cultivar. Research done at WFREC played an important role in the release of several other soybean cultivars with resistance to the root knot and cyst nematode. In addition, Dr. Kinloch devised a scheme of crop rotation and management systems which reduced the impact of root knot nematode predation in cotton, peanut, and corn.



Dr. Hugh A. Peacock, Center Director, 1973-1997

Dr. Hugh Peacock joined the WFREC as Professor and Center Director in 1973 and assumed, in addition to administrative responsibilities, the responsibility for the testing of cotton, corn, peanut, small grains, and grain sorghum cultivars. Through research on the nitrogen needs of cotton, a system was devised to determine nitrogen need through petiole nitrate testing. By using the petiole nitrate testing system, an excess of nitrogen was never applied to the growing plants, thereby saving production costs for the farmer.





Dr. Barry J. Brecke, Agronomist and Weed Scientist

Dr. Barry Brecke joined the faculty of the WFREC as Assistant Agronomist, Weed Scientist, in 1975 and began expanding the weed management studies begun by Mr. R. L. Smith in corn, cotton, peanut, grain sorghum, small grains, and pasture grasses. Research in reduced tillage and narrow row cropping systems was initiated to develop effective weed management practices for these systems. A weed biology research program was established to provide information for devising more effective weed management for troublesome weed species. Dr. Brecke also established a turfgrass weed management program to address the weed management problems of turfgrass managers. He was also instrumental in establishing graduate student education at WFREC.

Research at WFREC in the early days was devoted almost entirely to crop and animal production. The early demand in Florida was for fertilizer testing, variety testing, pasture development, and other production problems. Agriculture in Florida was stabilized and increased greatly as a result of such research.

Significant changes occurred at WFREC during the 1990's. As Drs. Lutrick, Bertrand, Kinloch and Dunavin retired during the mid to late 90's, the soil fertility, animal science, forage production and nematology programs at WFREC were phased out. New programs were initiated as part of an off-campus teaching program established in cooperation with Pensacola Junior College, now Pensacola State College (PSC).

In 1990, the Florida Legislature approved \$3.57 million to establish a University of Florida teaching program on the PSC Milton campus. The funds were for facilities and equipment and two buildings, one for classrooms and laboratories and the other for faculty and administrative offices including conference rooms, to be shared by PSC and UF for Natural Resource Conservation and Environmental Horticultural studies were constructed. The first UF teaching faculty was hired in late 1994 with the first classes offered in 1995. The first student with a B.S. from the cooperative program was graduated in 1997.

The UF teaching program on the PSC Milton campus was established to serve the needs of west Florida and the surrounding region and allow students to remain in this area while completing a degree from UF. This teaching program allows students to earn a B.S. degree in Natural Resource Conservation or Environmental Horticulture (now Plant Science) from the University of Florida while remaining in the Milton area. Since the teaching program at Milton was initiated in 1995, the academic programs have graduated over 250 undergraduates with a B.S. degree from the University of Florida.

Our Bachelor degree graduates are employed throughout the region, many in supervisory positions including but not limited to positions in plant nurseries, as golf course superintendents as foresters in several state forests, as county foresters, teachers in middle school and high school, at Florida Department of Environmental Protection, in water management district positions, Natural Resource division of Eglin AFB, Florida Power and Light, Consulting

agencies, and Florida Fish and Wildlife Conservation and Natural Resource Conservation Service. Other graduates are employed in similar position but throughout the country including Texas, Idaho, and Washington DC to name a few. These graduates have been highly successful in their careers.

Our students have displayed academic excellence and as a result many of our students graduate with honors, receive awards, go on to graduate school, receive scholarships, participate in university honors programs and receive research internships. Our faculty is responsible for 34 courses that originate from Milton (not counting special topic courses and internships) and are either taught face to face or through distance learning. Some of these courses not only serve students in Milton and Gainesville but throughout the country.

Dr. Peter Linehan joined the WFREC faculty in 1994 and was the first faculty member hired as part of the new teaching program. His area of expertise was Forest Management and he initiated classes in the new program in 1995. Dr. Linehan put considerable effort into establishing the new teaching program through recruitment of students and developing courses for the new program. In addition, he conducted research in forest economics and modeling of natural resource systems.



Dr. Debbie Miller, Professor and Teaching Coordinator, Wildlife Ecology & Conservation

Dr. Debbie Miller was hired in 1995 and has a 70% teaching and 30% research appointment in the Department of Wildlife Ecology and Conservation. Dr. Miller is the advisor and undergraduate coordinator for the Natural Resource Conservation (NRC) degree program at the UF/IFAS Milton Campus and teaches or co-teaches 6 courses to support the undergraduate NRC degree and online master's degree in Ecological Restoration. Courses taught include Wetland Wildlife Ecology, Wildlife of Florida and Wildlife of Florida lab, Plant Communities of Northwest Florida (graduate and undergraduate), Natural Resource Sampling, Integrated Natural Resource Management and Longleaf Pine Ecosystem Ecology and Restoration (graduate and undergraduate). Dr. Miller's research is focused on community and landscape ecology and restoration.

Topics include plant/animal interactions and disturbance ecology within barrier island, longleaf pine and wetland ecosystem. Many of Dr. Miller's projects involve collaborative efforts with researchers from Environmental Horticulture, Forest Resources and Conservation and Wildlife Ecology and Conservation.



Dr. Mack Thetford was another addition to the WFREC in 1995. Dr. Thetford has a 60% teaching and 40% research appointment. His position in the Environmental Horticulture Department supports the ongoing distance education degree programs of UF in partnership with PSC. Plant identification, plant propagation, plant production systems, and landscape plant establishment with a focus on native plants and development of establishment systems

for ecological restoration are subject areas of his work. His research program broadly encompasses landscape management,

development of propagation systems, development of production systems, and evaluating the effects of these systems on landscape establishment. In recent years he has led efforts to evaluate Pomegranate and Olive production potential in the Florida panhandle but has returned his primary focus to an interdisciplinary approach to ecological restoration for coastal dune systems of Florida. Dr. Thetford teaches several courses including Plant Propagation, Advanced Plant Propagation, Annual and Perennial Gardening, Advanced Annual and Perennial Gardening, Dendrology of Forest Plants, Plant Identification Lab, Greenhouse and Nursery Crop Culture Lab and Plant Communities of Northwest Florida.



*Dr. J. Bryan Unruh, Professor
and Associate Center Director,
Environmental Horticulture*

Dr. Bryan Unruh joined the WFREC faculty in 1996 as Extension Turfgrass Specialist. In addition to his extension effort, Dr. Unruh contributed to the Milton Campus teaching program until 2010. Dr. Unruh's turfgrass science research and extension program is at the forefront of improving Best Management Practices (BMPs), understanding the changing consumer preferences and behavior related to landscape management, and testing new and novel grasses that have improved turfgrass performance characteristics and require fewer inputs to maintain them. Results from his team's work are included in all three Florida turf industry BMP manuals. Unruh's team was selected to develop the Golf Course Superintendents of America's National BMP Planning Guide and Template with the end-goal of having golf-centric BMP manuals in

all 50 states by 2020; a goal that was achieved in December 2020. In June 2022, Dr. Unruh's Florida Golf Course BMP Certification Program was memorialized in state statute when Gov. DeSantis signed HB967 into law.

Dr. Rick Schoellhorn was also hired in 1996 and his area of study was herbaceous tropical perennial ornamental plants. His research program aim was to develop production practices for tropical perennials and to study the physiology of these ornamental species. He researched all phases of greenhouse production, plant growth regulator use, photoperiodic control of flowering and new crop production issues for those crops not now in common usage by industry. He also established the Milton Gardens where new ornamental introductions could be viewed by the public. He taught courses in Nursery Operation and Management, Annual and Perennial Gardening, and Greenhouse Nursery Crop Culture.

In 1998 **Dr. Donn Shilling** assumed the duties of WFREC Center Director following the retirement of Dr. Peacock. Dr. Shilling was a Weed Scientist in the Agronomy Department in Gainesville prior to becoming Center Director. While on the Agronomy Department faculty Dr. Shilling worked on developing management systems for invasive weeds such as cogongrass. During his tenure as Center Director, the teaching program continued to expand, and additional faculty were added to the WFREC roster.

Dr. Shibu Jose joined the WFREC faculty in Forestry Production in 1998. Dr. Jose's research program included production of forest products, invasive plant (cogongrass) management in intensively managed pine plantations, and development of alley cropping systems that could be used during transition from crops to forest (agroforestry) He also researched productivity and sustainability of natural and planted forests, and growth response of longleaf pine following fertilization and herbaceous weed control treatments at establishment. Dr. Jose taught courses in Silviculture, Forest Ecology, Agroforestry and Natural Resources Sampling as part of the WFREC teaching program.



Dr. J. Jeffrey Mullahey, Center Director, 2000 - 20012

Dr. Jeff Mullahey began his tenure as Center Director of WFREC in 2000 following the resignation of Dr. Shilling. Dr. Mullahey had a background in Range Science and conducted research on management of Tropical Soda Apple in rangeland while on the faculty of the Southwest Florida Research and Education Center in Immokalee. Under Dr. Mullahey's leadership, WFREC continued to expand its programs and grow in importance to our clientele groups.

In 2003, **Dr. Jamie Gibson** replaced Dr. Rick Schoellhorn in the Nursery Management position at WFREC. He taught several new courses including Introductory and Advanced Nursery Management, Greenhouse and Nursery Crop Culture, Water Quality and Irrigation, and Retail Marketing and Management. Dr. Gibson's research projects included developing sustainable greenhouse production practices and plant growth regulator research.

Dr. Rick Williams replaced Dr. Peter Linehan in 2003. Dr. Williams's areas of expertise included Forestry Management and Forest Economics. He served as Extension Forestry Specialist and in that capacity conducted workshops and field demonstrations for owners of forest lands. Dr. Williams conducted research on invasive, non-native weed management, rural land management, hurricane recovery, development of wildlife food plots, multi-species tree evaluation, fertility during tree establishment, and weed management during tree establishment. Dr. Williams taught courses in Integrated Natural Resource Management, Quantitative Forest Management, Forest Mensuration, and Natural Resource Policy.



Dr. Kimberly Bohn, Forest Ecology & Conservation, Natural Resource Conservation

Dr. Kimberly Bohn replaced Dr. Shibu Jose in 2006 in the Forest Ecology and Silviculture position. Her research included ecology and management of longleaf pine ecosystems, silviculture of southern conifers and mixed-wood stands, interference by native and non-native species, forest recovery from disturbance (hurricane, wildfire). Dr. Bohn taught Forest Ecology, Silviculture, Natural Resource Sampling and Tree Biology.

Dr. Marian Marinescu joined the WFREC faculty in late 2006 in a new position of Forestry Utilization. He initiated an extension and research program to address the needs of the forest industry to develop new uses for forest products. Dr. Marinescu focused on biofuels and the potential to use by-products of the forestry industry as a source for alternative fuels such as ethanol.



Dr. Sonali Padia, Environmental Horticulture

In 2008 **Dr. Sonali Padia**, Assistant Professor, Environmental Horticulture, replaced Dr. Jamie Gibson in Nursery Management. She taught courses similar to those taught by Dr. Gibson including Introductory and Advanced Nursery Management, Greenhouse and Nursery Crop Culture, Water Quality and Irrigation, Retail Marketing and Management. Dr. Padia resigned in 2010 and the WFREC Nursery Management position was not refilled.



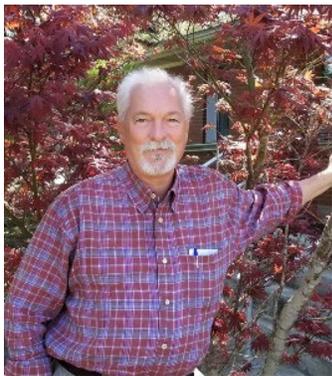
Dr. Ronnie Schnell, Cropping Systems Specialist

Dr. Ronnie Schnell accepted the position of Assistant Professor Cropping Systems Specialist at WFREC in 2010. He established the WFREC Cropping Systems research (60%) and extension (40%) program area. He studied fertility programs for the agronomic crops grown in the panhandle as well as crop rotations and new and alternative crops for the area.



Dr. Ramon Leon, Weed Science

In 2012 **Dr. Ramon Leon** was hired as Assistant Professor, Weed Science, to replace Dr. Barry Brecke who had retired. Dr Leon's appointment was 70% research and 30% extension in row crop and turfgrass weed management. He developed a program in weed biology, genetics of herbicide resistance in weeds, managing weeds to prevent the development of herbicide resistance and herbicide evaluation in both row crops and turfgrass. He also developed an extension program in turfgrass and row crops to make sure the information he developed from his research was made available to end users. He was also active in the WFREC graduate student program and supervised several M.S. and Ph.D. students during his tenure at WFREC.



*Dr. C. Wesley Wood, Center Director
2014 - Currently*

Dr. Wes Wood was appointed Professor and Center Director in 2014. Prior to joining WFREC Dr. Wood taught and conducted research on carbon and nutrient cycling in managed and natural ecosystems and has published >150 refereed journal articles on that topic. He conducted research in Lithuania, Latvia, Estonia, Tanzania, Ecuador, India, Brazil, South Africa, Kenya, Peru, Thailand, Honduras, Mexico, The Philippines, Haiti, and New Zealand. Dr. Wood served as Associate Editor and later as the Soil Science Technical Editor for the Agronomy Journal. He has won awards for his research, is a Fellow of the American Society of Agronomy, and is also a Fellow of the Soil Science Society of America. As Director of WFREC, Dr. Wood provides leadership and support for teaching, research and extension programs essential to the agricultural, natural resource conservation, environmental and consumer interests of the Florida Panhandle.

The WFREC has grown and become more productive during the eight years of Dr. Wood's leadership. Since 2014: 1) faculty numbers have increased from five to ten; 2) employee numbers have increased from the 40s to the 70s; 3) undergraduate student enrollment has increased from the 30s to the 60s; 4) graduate student numbers have increased from low single digits to the high teens; 5) annual research grant funding has increased from ~ \$200K to ~ \$2M; 6) annual refereed publication numbers have increased from low single digits to the high 30s; and, 7) many substantial infrastructure projects have been completed and are in use. The WFREC is now in overall better shape and is more productive than it has ever been in its history.



*Dr. Michael Mulvaney, Cropping
Systems Specialist*

In 2014 **Dr. Michael Mulvaney** replaced Dr. Ronnie Schnell as Assistant Professor, Cropping Systems Specialist. He continued to grow the research and extension Cropping Systems program in the areas of crop rotation, fertility, and alternative crops. He expanded the program to include study of covercrops, plant growth regulators, additional alternative crops, crop planting patterns and crop seeding density. His extension program provided information about cropping systems to growers in Florida and the southeastern U.S.



Dr. Matthew Deitch, Watershed Management

mainly on the Florida Panhandle. Dr. Deitch partners with agencies, conservationists, private landowners, other academic researchers, and other stakeholders in the region to improve the wellbeing of the people and ecosystems of northwest Florida. Dr. Deitch teaches Conservation Hydrology and Watershed Planning and Management and part of the NRC degree program.

Dr. Matthew Deitch initiated a new program at WFREC as Assistant Professor, Watershed Management in 2016 with a 70% research and 30% teaching appointment. His research interests include ecological implications of water management at reach- and catchment-scales, as well as how science can inform policy to advance sustainable water resource management. His research has been used to develop new policies and practices to improve aquatic ecosystem sustainability. The University of Florida Watershed Management Lab is located on the WFREC-Milton campus and the research conducted there focuses on how sustainability of ecosystems and communities along landscapes, streams, and estuaries can be maintained



Dr. Silvana Paula-Moraes, Entomology

In 2016 **Dr. Silvana Paula-Moraes**, Assistant Professor, Entomology established a new Entomology program at WFREC. Dr. Paula-Moraes has 70% research and 30% teaching appointment. Her research focuses on the general area of applied insect ecology and addresses several aspects of Integrated Pest Management (IPM), including the development of economic thresholds, sampling plans, cost-benefit analysis, host plant resistance, crop environmental manipulation and characterization of the risk of invasive pests to cropping systems. Her research also addresses biology and behavior of insects as applied to Insect Resistance Management with focus on insect movement, host utilization and differential exposure to Bt toxins. In addition to her research, she teaches Principles of Entomology and Fundamentals of Plant-Pest Management.



Dr. Ajay Sharma, Forest Resource and Conservation

Dr. Ajay Sharma replaced Dr Kimberly Bohn in 2017 as Assistant Professor, Forest Resource and Conservation, 60% teaching and 40% research. Dr. Sharma is one of two faculty members responsible for administering the Natural Resource Conservation (NRC) undergraduate teaching program at the WFREC and delivering upper division courses leading to a B.S. degree in the School of Forest, Fisheries, and Geomatics Sciences with a major in NRC. He teaches Natural Resource Sampling, Field Operations for Management of Ecosystems, Forest Ecology, Silviculture, Foundations in Natural Resource

Conservation, Forest Mensuration and Professional Development. Dr. Sharma's research program is focused on silviculture, restoration, and disturbance ecology of forest ecosystems. His research covers a wide variety of topics related to even-aged and uneven-aged silviculture, long-term stand dynamics, fire ecology, hurricane impacts, and forest restoration. Most of his current research, however, is focused on applied forest ecology and restoration of southern pine ecosystems and floodplain forests.



Dr. Pratap Devkota, Weed Science

strategies; and incorporating them for developing integrated weed management programs. Understanding the ecology, biology, and morphology of difficult to control/invasive weed species is an additional goal. Through his extension program Dr. Devkota delivers research findings to the end users (county extension agents, growers, applicators, industry partners, and government & non-government organizations) using various activities which include face-to-face meetings, weed science trainings, clientele meetings, online newsletter/blogs, and social media sites, extension publications (UF/IFAS EDIS system), and extension field days.

In 2018 **Dr. Pratap Devkota** replaced Dr. Ramon Leon as Assistant Professor, Weed Science. The weed science research (60%) and extension (40%) program at WFREC focuses on developing integrated weed management programs and extending this knowledge to agricultural clientele in Florida. The program emphasizes addressing current and emerging weed management issues for field (cotton, peanut, corn, soybean, wheat), forage, and emerging crops (e.g., specialty and bioenergy). The research emphasis is on managing herbicide resistant weeds; evaluating performance and optimizing various weed control methods; identifying novel and improved weed management



Dr. Hardeep Singh, Cropping Systems Specialist

In 2022 **Dr. Hardeep Singh**, Assistant Professor, Cropping Systems Specialist replaced Dr. Mike Mulvaney. His appointment is 60% research and 40% extension with the main crops of interest including peanut, cotton, corn, soybean, wheat, and carinata. The focus of his program is on the development of improved integrated crop fertility management tools and technologies. Other areas of interest include disease management, genotype evaluation, basic agronomy, phenology tracking for modeling purposes and precision agriculture applications. The goal of Cropping Systems Extension program centers on the education of stakeholders about improved nutrient management and soil health in North Florida cropping systems. The program is designed to provide evidence-based information to agents, growers, agricultural professionals, and policymakers to inform decisions related to crop management. Factors that

affect nutrient management and cycling, such as irrigation scheduling, rotations, cover cropping and soil management, are an integral part of his program. Content is delivered via face-to-face meetings, websites, smart phone apps, EDIS publications, popular press articles, social media, and grower field days.



Dr. Victoria Donavon, Forest Management

Dr. Victoria Donavon assumed duties as Assistant Professor, Forest Management, 60% teaching and 40% research in 2022. Dr. Donavon will teach Fire Ecology, Geographic Information Systems, Forest Mensuration, Foundations of Natural Resources and co-teach Natural Resources Sampling and NRC Capstone. Her research will focus on landscape patterns and drivers of ecosystem and species persistence in the face of change; fire dynamics and their impacts on population, community, and ecosystem recovery; multi-scale ecosystem dynamics; landscape ecology; ecological resilience theory; conservation and restoration; natural resource management; macrosystems ecology; wildlife ecology and management; and global change biology.

The West Florida Research and Education Center (previously the West Florida Experiment Station) has always worked in close cooperation with the County Extension faculty of the Northwestern panhandle of Florida. In addition, throughout its 75-year history, the Research Center has worked in close cooperation with growers, land managers and ranchers of the area, and with manufacturers and suppliers of agricultural products. This teamwork, among those most interested in the welfare of agriculture in this area, has continued to date and has resulted in many studies which have had a healthy influence on the economy and the ecology of the West Florida area and Florida in general.

Research Accomplishments at West Florida Research and Education Center, 1947-2022.

Zinc Deficiency in Native Soils-

Early research indicated an overall deficiency of zinc in the native soils of this area that could be corrected by the addition of a small amount of zinc in fertilizer applications. Zinc deficiency reduced the yield of most field crops, and especially, corn.

Soil Fertility-

Native soils were found to be low in phosphorus and nitrogen. Most crops responded to a one ton per acre rate, but research showed a rate of 2 tons per acre increased yields by 100% for grain sorghum.

Research conducted on the spreading of liquid digested sludge on agricultural soils in West Florida indicated that cotton and peanut were damaged by liquid digested sludge applications, but applications were beneficial to corn, soybean, grain sorghum, permanent pasture grasses, and seedling pine trees.

Crop Evaluation-

Over the years, research identified varieties of corn, peanut, soybean, grain sorghum, small grains, and forage grasses and legumes that were adapted to the soils and climatic conditions of West Florida. Research was conducted also to determine the optimum times for planting and seeding rates for the various crops.

Foundation seed of a number of crops, i.e., Dixie Runner peanut, Southland Oats, Centennial and Cobb soybean, and Pensacola and Argentine bahiagrass were grown on the soils of WFES for distribution to farmers. This was the beginning of the Florida Foundation Seed Producers.

The WFREC was instrumental in developing, through research covering several years, cropping systems, one of which became the highest income producing cropping system in the West Florida area.

Researchers at WFREC did much of the early work with Pensacola bahiagrass and showed it to be superior to other grass forages grown in the area at the time. In addition, through research, a year-round program of forage production was worked out that allowed calves born in the area to be retained in the area until they were large enough to be sold as feeders rather than stockers.

Horticultural Crops-

Research indicated that tomatoes could be grown successfully in plastic greenhouses with yields exceeding 100,000 pounds/acre of greenhouse space. Several varieties suitable for greenhouse culture were identified for commercial or home use.

Cattle and Pasture Management-

Management programs for the production of year-round grazing systems were devised and were widely adopted by cattle producers in West Florida. This added to the profit from raising cattle because the winter feed could now be produced on the ranch where the cattle were produced.

Several grazing programs were devised through research over a number of years, which made maximum use of winter grazing in the overall management of beef cattle in this area. The use of these research findings added to the profit margin of the cattleman in West Florida.

Research on ryegrass as a temporary winter pasture grass resulted in the release of several improved varieties in cooperation with personnel in the Agronomy Department of the University of Florida. One of these varieties, Gulf, is grown on more acreage in the Southeast than any other ryegrass variety.

Nematode Resistance-

The WFREC participated in the release of several varieties of soybean with genetic root knot nematode resistance and that were adapted to the soils of West Florida and the Southeast.

A soybean variety, Centennial, which had genetic resistance to the soybean cyst nematode, was developed and released for farmer use through research carried out for several years at WFREC. At one time, the Centennial variety was planted on more acreage in the Southeast than any other soybean variety and increased yields ranging from 50 to 250% more than a cyst nematode susceptible check variety. Several varieties resistant to root knot nematode were also released.

Nitrogen Fertilizer-

Research on nitrogen use by cotton resulted in the development of petiole testing to determine the nitrogen requirement of cotton plants during the growing and fruiting stages of development. Petiole testing for nitrogen use and need by the cotton plant, prevented excess application of nitrogen fertilizer, which resulted in less fertilizer use and less production cost.

Weed Management Systems-

Weed management programs for cotton, peanuts, soybeans, corn and pastures have been developed at WFREC that have increased the profitability of cropping systems in Florida. Research conducted at WFREC has been used in the development of many new herbicides that have provided safe, economical weed control for growers.

Weed biology information developed at WFREC has led to improved management of troublesome weeds. In cooperation with the University of Georgia and North Carolina State University, an interactive computer-based decision aid was developed to help evaluate potential crop damage from multi-species weed complexes in peanut and to determine the appropriate course of action.

Weed management programs for turfgrass have been developed based on research conducted at WFREC. Turfgrass managers have been provided options for management of difficult to control perennial weeds as a result of projects conducted at WFREC.

An externally funded project to evaluate effects of herbicide treatments on invasive and non-target species was established in the natural forest area at WFREC. The research was carried out for credit in the Natural Resource Conservation degree program by an undergraduate student to analyze control of the invasive species Japanese climbing fern. Other research studied the impact of weeds on fungicide deposition in peanuts. It was determined that broadleaf weeds trapped fungicide before it reached the crop canopy leading to an increase in disease. Thus, controlling weeds not only reduces weed competition but also improves disease management.

Planting crops in narrower rows was found to provide improved competition with weeds and reduce the level of herbicide input needed.

Weed control strategies have been developed on *Brassica carinata*, a renewable biofuel crop. In addition, the contribution of summer crops on weed dynamics for winter carinata production has

been quantified. Contribution of winter cover crops for problematic weed management in subsequent cotton production system has been determined. In addition, herbicide drift injury potential has been quantified using imagery from unmanned aerial system (UAS).

Forestry-

Renewed interest in longleaf pine restoration has prompted faculty at WFREC to investigate appropriate methods for establishing, restoring, and managing longleaf pine plantations. Several short and long-term studies were established at WFREC and across the Florida Panhandle during the 1990's, 2000's and 2010's to investigate several site preparation treatments, regeneration methods, burning season and ignition methods, and techniques to restore native diversity. Many of the existing longleaf pine ecosystems on large, publicly owned lands are being converted to uneven-aged conditions that mimic forest structure resulting from natural disturbances. Multiple studies by WFREC faculty have quantified the spatial relationship of residual overstory trees and natural regeneration groupings that resulted after two consecutive hurricanes and following alternative silvicultural methods. WFREC is now widely acknowledged for its contribution to advancing longleaf and other southern pines' ecology and management, especially in the field of uneven-aged silviculture and hurricane impacts on forests. WFREC research also characterized structural diversity of longleaf pine across the southern United States and the entire outer coastal plain mixed forest province, leading to production of structural diversity maps and hot spots and cold spots maps for the region. WFREC forestry faculty now also contributes to a multi-disciplinary effort aimed at understanding how restoration projects in the Apalachicola River floodplain (Florida Panhandle) will address decades of observed alteration to flood regime, reduction in slough flow connectivity, shifts in floodplain forest composition, and overall degradation of aquatic habitats caused by anthropogenic and climatic variables.

Natural Resource Conservation-

Twenty-seven years of coastal restoration research lead by Dr. Miller and Dr. Thetford culminated in the publications of a Dune Restoration and Enhancement manual for the Florida Panhandle. The manual is used and recommended to the public by restoration professionals, government agencies and non-profits throughout the region. Drs. Miller and Thetford are recognized as the leading authorities on restoration of coastal dune habitats for important coastal plants and wildlife and are presently involved in coastal dune restoration projects on both the Atlantic and Gulf coasts of Florida.

Turfgrass-

Turfgrass Best Management Practices (BMPs) were developed for the turfgrass industry and resulted in publication of "Florida Green Industries Best Management Practices for Protection of Water Resources in Florida," (first published July 2002), "Best Management Practices for the Enhancement of Environmental Quality on Florida Golf Courses" (first published January 2007), and "Water Quality/Quantity Best Management Practices for Florida Sod" (first published June 2007). Unruh's team was selected to develop the Golf Course Superintendents of America's National BMP Planning Guide and Template with the end-goal of having golf-centric BMP manuals in all 50 states by 2020; a goal that was achieved in December 2020. In June 2022, Dr. Unruh's Florida Golf Course BMP Certification Program was memorialized in state statute when Gov. DeSantis signed HB967 into law.

Nearly 4,000 turfgrass cultivars have been evaluated for improved turfgrass quality and drought response. This work provides the basis for UF/IFAS Turfgrass Cultivar recommendations. Additionally, five new cultivars have been released from these evaluations – Toccoa Green™ Zoysiagrass, UltimateFlora Zoysiagrass, Hammock Centipedegrass, CitraBlue™ St. Augustinegrass, and CitraZoy™ zoysiagrass.

Work on nutrient fate from landscape turf has also been used refine Florida’s fertilizer recommendations on lawn grasses. These rates structures are now required on all fertilizer bags sold in consumer retail outlets. Additionally, results from this research were used to modify the Urban Turf Rule (Rule 5E- 1.003 F.A.C.) which provides regulatory oversight of urban turf and lawns in an attempt to protect Florida’s natural water resources.

Entomology-

The WFREC Entomology program was established in 2016 to develop management programs of pests associated with agronomic crops and turfgrass. The 5-year-old program has been responsible for developing region-specific information for Integrated Pest Management while also becoming an independent, nationally, and internationally recognized research program. One of the outcomes of this program is an Insect Flipbook that contains information for the management of the pests in cotton in the Florida Panhandle and is now being distributed to clientele. Because the Florida Panhandle is also a gateway for invasive pests, including migratory populations of moths, pests are being actively tracked in commercial fields in the region. Additionally, undergraduate and graduate courses in IPM that were never available in West Florida before were developed and taught.

2022 WFREC Faculty



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