FLORIDA PIONEER WILMON NEWELL: THE PAST, PRESENT AND FUTURE OF INSECT PEST CONTROL

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Dr. Wilmon Newell was a pioneer whose roots extended far deeper than the primordial Florida Entomological Society. Imagine the field of entomology in 1878 when he was born, and the great body of work he accomplished as Florida established agriculture and associated pest management capabilities. For perspective, he was almost 20 years old when the battleship Maine exploded in Havana Harbor signaling the beginning of the Spanish American War. It was not until the turn of the century that the U.S. Army Yellow Fever Commission, headed by Walter Reed, proved that yellow fever was a viral disease transmitted by *Aedes aegypti*. Soon thereafter, on January 5, 1916, the Florida Entomological Society was established with J. R. Watson as president and Wilmon Newell the secretary-treasurer. Newell had recently been appointed Plant Commissioner of the Florida State Plant Board, created in 1915 initially to eradicate citrus canker. He directed the first Mediterranean fruit fly eradication campaign in 1929-30, and was instrumental in successfully eliminating citrus canker from Florida in the early 1930s. This Florida pioneer entomologist cooperatively accomplished these extraordinary pest management feats before the era of synthetic chemical pesticides. To provide an historical perspective for Dr. Newell's distinguished career, John T. Creighton wrote his obituary for the Journal of Economic Entomology in 1943, himself honored as a Florida Entomological Society Pioneer in 2000.

Dr. Wilmon Newell

Wilmon Newell was born at Hull, Iowa on March 4, 1878, receiving his B.S., M.S., and honorary Sc.D. degrees from Iowa State College in 1897, 1898, and 1920, respectively. He served as Assistant in Entomology at the Iowa Agricultural Experiment Station from 1897 to 1899, held the same position at the Ohio Agricultural Experiment Station from 1899 to 1902, became Associate Entomologist and Apiarist at the Texas Agricultural Experiment Station for a year, moved again to be the State Entomologist of Georgia from 1903 to 1904, transferred in 1904 to the position of Entomologist for the State Crop Pest Committee of Louisiana, and returned to Texas in 1910 as Entomologist of the Experiment Station and State Entomologist, a position he held until 1915 when he came to Florida as Plant Commissioner of the newly established State Plant Board. In addition to being Plant Commissioner, in 1921 he became Dean of the College of Agriculture and Director of the Florida Agricultural Experiment Station and the Agricultural Extension Division. In 1938, he was appointed Provost of the College of Agriculture at the University of Florida. Dr. Newell's tremendous zeal for work and executive ability were responsible for the number of positions he held and in great part accounted for the prominence of the Florida Agricultural Experiment Station in the 1920s through the 1940s.

Some of Dr. Newell's finest research was on control methods for the cotton boll weevil, Argentine ant, and American foul brood in honeybees. During his long career, he published technical papers on cotton and scale insects, apiculture, quarantine programs and procedures, and insect eradication. Dr. Newell had a particular interest in ant taxonomy, but also conducted pioneering research on boll weevil control in Louisiana and maintained a deep interest in apiary work in Texas and other states. However, he was best known for his activities in control and eradication of plant pests. He directed eradication from Florida of the Mediterranean fruit fly, citrus canker, and citrus blackfly. He also surveyed extensively for the Argentine ant along the Gulf Coast, particularly in Louisiana. His ant collection is in the Florida State Collection of Arthropods, Division of Plant Industry, in Gainesville. The State Plant Board became the Division of Plant Industry in 1960, one of 10 divisions in the Florida Department of Agriculture and Consumer Services.

Dr. Newell attained many honors, including member of the advisory council of the Southern Forestry Experiment Station of the Southern Forestry Service, member and president in 1920 of the American Association of Economic Entomologists, charter member of the Cotton States Branch of the Association, member and president in 1929 of the Association of Southern Agricultural Workers, University of Florida representative of the Institute for Research in Tropical America, member of the Soil Science Society, administrator of Florida State Soil Conservation, chairman of the Florida Land-Use Planning Committee, and chairman of the Advisory committee on Agriculture of the Florida Defense Council. He was also a Mason and a Shriner, a member of Kappa Sigma social fraternity, and member of the honorary fraternities of Alpha Zeta, Phi Kappa Phi, and Gamma Sigma Delta. The students in the Department of Entomology in the College of Agriculture held him in such high esteem that they named their professional society the Newell Entomological Society in his honor. Subsequent to Dr. Newell's death, the Florida State Board of Control and The State Board of Education, at the direction of Governor Spessard L. Holland, dedicated the rebuilt Agricultural Experiment Station Building on the University of Florida campus as Newell Hall, a memorial in his honor.

Harold Denmark, a past president of the Florida Entomological Society and Pioneer Lecturer, knew Wilmon Newell and shared some memories of this eminent pioneer and leader of Southern agriculture. Dr. Newell was a very personable man who helped many colleagues and students become professional entomologists. He was intensely concerned about invasive insects and diseases that affected agriculture in Florida and used the tools at hand to control or eradicate the most damaging pests of his time. His "scorched earth" approach to eradicating the Mediterranean fruit fly was conducted without regard to the environment and at extreme economic losses to growers. He was high-handed because he considered eradication to be critical. Perhaps he was justified based on the numerous awards he received for meritorious service. It is easy to criticize these somewhat imperious methods—but they were successful. Dr. Newell literally gave his life to serve Florida agriculture, sleeping only four hours a night. One of his last comments to John T. Creighton was the wish that he could live longer to solve more pest problems in Florida and the world. Dr. Newell was passionate about his life's mission and worked relentlessly to protect Florida's agriculture.

Wilmon Newell's remarkable successes in pest control during the first half of the last century were taken as the starting point for this Pioneer Lecture. His successes are now considered in light of current control efforts directed at thrips pests—these being the target organisms of much of my research, as well as that of Joe Funderburk, 1998 president of the Florida Entomological Society. There can be no doubt that Newell's dynamic approach to such problems would be socially unacceptable today. Newell lived in a time when actions intended for the greater good of society held precedence over personal rights. These days, disrupting the lives of citizens by blanket pest control methods would quickly lead to litigation, and entomologists must work within this very different social milieu. Only in parts of the world where citizens have far more limited civil rights than in Florida can the "Newell Approach" still be practiced.

A second problem associated with Newell's eradication methods is that his very success contributed to one of the greatest problems that face us in pest control—the view that it is actually possible to eradicate one type of organism without affecting the lives of other organisms. Such a view runs deep through the human psyche. Consider the response of a U.S. funding agency to a research proposal by an eminent entomologist who wished to examine the epidemiology of thrips-born tospoviruses that cause serious crop losses. The formal rejection notice from the funding agency stated that in the view of the committee all that was needed was for "the thrip be killed". This chilling response, the Curse of Cain, is all too human and all too frequent, but as scientists we represent the sons of Abel and must try to do things differently.

The magic initials IPM represent a banner around which biologists can gather and organize new methods of crop production—methods that recognize that our children will need clean water and clean air as well as biological diversity in the landscapes within which they live. But, at least in pest thrips control, we find that these initials too often represent *Ignorance*, *Prejudice* and *Mismanagement*. Amongst a range of growers visited in recent years, there have been those who could not see insects as small as thrips, some insisting that their tospovirus problems are due to aphids. There are those who blame their neighbors for the heavy thrips and virus infestations that are destroying their lettuce crops, while rejecting the fact that their beautiful beds of French marigolds are the source of their problems. And there are those who, at considerable expense, cull all infested plants but then thoughtlessly dump these in a heap just up-wind of their crop, so that the viruliferous thrips fly straight back into the crop. In contrast, other growers keep their crops clear of thrips and tospoviruses—and it is instructive and heartening to talk to such growers and recognize their deep appreciation of insect behavior and insect/plant relationships. Thus, we can do better—but it requires that effort that is so difficult for all of us, thinking.

Good IPM demands that we learn all that we can about the biology of our target pests and their relationships to our crops, and that we also have a

sound knowledge of the other organisms that are in and around those crops. It recognizes that these different organisms are interdependent, and that disrupting one will have effects on others. In the 1998 Pioneer Lecture, I drew an analogy between pest control and human warfare, remembering that Clauswitz emphasized that all items of information about an enemy,—economic, social, and behavioral—are useful in leading to victory. Similarly, Sherman's lateral thinking in marching from Atlanta to the sea was responsible for shortening America's bloody civil conflict—not through killing, but through disrupting and demoralizing his opponents. What can we as biologists learn from these proponents of "total warfare"? Are we still in the paradigm of Sherman's colleagues who advocated massive frontal attacks?

The important lesson is that we can never know too much about our opponents—how they live, how they feed, their behavioral prejudices and preferences. In contrast, the approach to thrips pests around the world still places great emphasis on killing, rather than on studying. Our understanding of thrips biology has improved considerably in recent years, but our knowledge of the biology of pest species is often remarkably weak (Mound 2004). Even simple questions are too often ignored, such as where populations of thrips in a crop come from—from the soil in which the crop is growing or through immigration from surrounding plants; or where do thrips pupate—on the crop, in leaf duff, or in soil? Thrips workers in Florida are among the few worldwide who recognize the problems inherent in this lack of information about thrips biology, and who are finding alternative ways of reducing crop losses to these pests. The University of Florida web site gives some details of their success <http://ipm.ifas.ufl.edu/success-stories/tomato/vanquishing_virus.pdf>, and their thrips control program has resulted in the team receiving a prestigious USDA Honor Award for Excellence (Funderburk et al., 2005). The focus in Florida on the ecology of thrips pests contrasts with the Rambo-esque approach of grabbing a spray gun that so many in society find emotionally reassuring, even when economically ineffective. Wilmon Newell was an important Pioneer in his day, but these thrips workers represent a new generation of pioneers. We should not aspire to emulate our predecessors but build on their successes and, through expanding our knowledge base concerning pests, search for new ways in which we can optimize crop production and pest management for future generations.

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