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The Honorable Sonny Ramaswamy, PhD
Director, NIFA, USDA
Waterfront Centre, 800 9th Street, SW
Washington, DC 20024

December 1, 2017

Dear Dr. Ramaswamy,

On behalf of the Entomological Society of America (ESA) and its nearly 7,000 members, we appreciate the opportunity to submit initial input on NIFA funding priorities.

What is your top priority in food and agricultural research, extension, or education that NIFA should address?

As a Society, we recognize the difficult fiscal environment and recommend several broad areas that should be targeted for research investments which will have significant economic, societal, and competitive advantages.

- Increased federal investment in pollinator health research is a top priority for ESA. Insect pollinators contribute approximately \$3 billion annually to food production in the United States alone and contribute to the reproduction of 75-90% of flowering plant species, yet pollinator populations continue to decline with no single cause to blame. Secretary Sonny Perdue and Second Lady Karen Pence have already expressed support for pollinator health initiatives. Sustained investments in pollinator health research from NIFA is required to ensure the success of the American agriculture industry.
- Invasive species pose a threat to the American economy and way of life. Invaders such as the emerald ash borer (which will incur total costs of \$10-25 billion in the U.S. by 2019) and several dangerous mosquito species (which help to transmit public health diseases like the Zika and West Nile viruses) are but two examples. As global travel and trade expand, invasion pathways develop, threatening our food supply, public health, and environmental biodiversity. The establishment and spread of invasive species has increased dramatically despite increased efforts to detect, prevent, and manage them. Invasive species alone may incur costs of up to \$2.5 billion annually with long-term effects on human and animal health, and agriculture. Without investments in invasion biology research, prevention and early detection programs, and rapid response programs, new invasive species will continue to be introduced and spread. ESA encourages USDA to establish an invasion biology program, as there are currently no federal programs that research the fundamental drivers of species invasion or explore the patterns and principles that apply to these invasions.

- As part of the federal approach to curbing the spread of destructive invasive species, ESA encourages NIFA to expand integrated pest management (IPM) practices and research in 2018. IPM is a holistic approach to managing pests and invasive species that looks to reduce the negative health and environmental effects of pest management. Both consumers and administrators have expressed concern over the widespread use of pesticides and insecticides, and a robust pest management portfolio is an avenue for federal agencies to increase agricultural production and reduce the long-term consequences of potentially harmful farming practices. USDA should continue to fund these efforts through the Integrated Pest Management Program and the Crop Protection and Pest Management Program and should look to expand partnerships with scientific societies and research universities to ensure that pest management policies are informed by objective scientific expertise.
- Finally, in this age of competing communication tools, it has become essential to ensure that science continues to be held in high regard and that policy decisions are made on evidence-based research. Ideology can never be allowed to supplant science. Knowledge is a continuum; each new advance in our understanding of science and our world is built upon the foundation of previous discoveries. The free flow of information is absolutely essential to scientific progress. America's leadership in advancing the frontiers of the life sciences is a defining attribute of our national character. We urge the agency to continue to promote these efforts, to respect the boundaries between science and politics, and allow objective scientific advancement to continue to enhance the health and welfare of our nation.

What are the most promising science opportunities for advancement of food and agricultural sciences?

The most promising opportunities for scientific advancement lie at the intersection of genomics, metabolomics, genetic engineering research, and pesticide resistance management to address the grand challenge of feeding a rapidly expanding world population with increasingly unpredictable water resources. When evaluating potential areas for increased federal investment, addressing long-term food security and sustainable increases in food production while conserving natural resources should be the number one priority. It is for this reason that ESA encourages USDA to make significant investments in genetics and genetic engineering research and take a proactive approach to solving the inevitable public health and nutrition crises that would arise in the event of a food shortage. While genetically engineered (GE) crops have been the subject of many controversial public debates, the scientific evidence is clearly supportive of further exploration and investment in these technologies. ESA supports investing in the development of resilient crops which are capable of withstanding drought, immune to common pests and pathogens, and capable of producing higher yields per harvest. Sustainable and safe GE crops are emerging as the most valuable tool in our toolkit for meeting the needs of a growing global population.

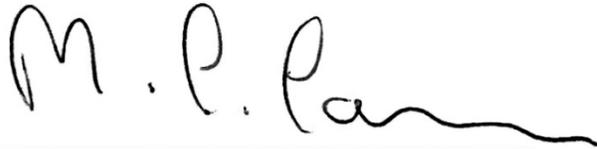
To complement GE crop research and maximize the effectiveness of federal investments, NIFA should incorporate Insect Resistance Management (IRM) into existing IPM initiatives to address insect species that become resistant to the insect-resistant properties of GE crops. As of 2016, seven cases of resistance in five major insect pests have been confirmed globally. IRM is an integral part of an effective IPM portfolio and is required to ensure that the public benefits from the advances in GE technologies, as the inability to control invasive, resistant pests could significantly affect the total yield per harvest. ESA commends NIFA for the agency's ongoing IPM initiatives, and encourages the agency to continue to be forward-thinking and strategic in their future investments. As GE crops become more commonplace IRM will become increasingly

important. A failure to address the issue of resistant pests in its nascent stages will ultimately be more difficult and more expensive to resolve down the line.

As part of this IRM strategy, USDA should convene private industry, academia, and regulators to establish a set of scientifically-driven IRM best practices to support the use of GE crop technologies for sustaining insect resistance over the long-term. This should include coordination on monitoring programs that enable early detection and economically proportionate responses to emerging resistance situations. NIFA has an opportunity to begin proactively addressing the food security and nutritional issues of the future, and while GE crops are not a silver-bullet solution, they provide incredible promise for ensuring that agricultural production is able to meet the needs of an exponentially increasing global population.

ESA is the largest organization in the world serving the professional and scientific needs of entomologists and individuals in related disciplines. Founded in 1889, ESA is a not-for-profit professional society affiliated with educational institutions, private industry, government agencies, and other non-profits. ESA's public and science policy initiatives focus on raising the importance of entomology, especially in the area of agriculture research.

Sincerely,

A handwritten signature in black ink, appearing to read "M. P. Parrella". The signature is fluid and cursive, with a long horizontal flourish at the end.

Michael P. Parrella, Ph.D.
2017 President, Entomological Society of America
Dean, College of Agriculture and Life Science, University of Idaho