MEMO

To: Carole Jett

Fr: Brise Tencer (Union of Concerned Scientists; Chair, NSAC Research, Education and Extension Committee; Ariane Lotti, DC staff for Organic Farming Research Foundation and National Sustainable Agriculture Coalition)

Re: Classical Plant and Animal Breeding Policy Needs

Dt: April 13, 2009

Carole, this memo is a belated follow-up to a request you made for additional information when you met with NSAC issue committee chairs during our NSAC annual meeting here in DC back in mid-March. A background statement follows, but we begin with key decisions that are on the table or should be on the table.

This is an issue that is at a crisis point, but one in which the table can begin to be turned, offering new promise not only for sustainable and organic farmers and ranchers in the US and around the globe, but also for the continuing ability to advance food security through the diversity and adaptability of breeds that form the foundation of the global food system. Congress took an important step forward in the 2008 Farm Bill, and robust implementation of that provision together with several complementary administrative actions and funding allocations now could be a real momentum changer, one the Secretary could really get behind and help move.

The first steps toward a long-term infusion of much-needed support for classical plant and animal breeding can be accomplished in several ways.

1. AFRI: Two new program areas should be designated within the AFRI structure, one to address conventional plant breeding, and another to address conventional animal breeding, each with an annual allocation of $10 million per year. The funding allocations within AFRI are entirely a USDA decision. Congress does not allocate specific dollar amounts to the national programs within AFRI.

The 2008 Farm Bill creates a new priority within the Agriculture and Food Research Initiative (AFRI) for convention (classical) plant and animal breeding.

More specifically, it calls for research, education and extension projects, for both plants and animals, on *"conventional breeding, including breed development, selection theory, applied quantitative genetics, breeding for improved food quality, breeding for improved local adaptation to biotic and abiotic stress, and participatory breeding."*

Congress further elaborated on its concern in this area through Statement of Managers:

> *The Managers are aware of the importance of supporting public sector conventional plant and animal breeding, as evidenced by the specific mention of this priority under the "plant*

health and production and plant products" and "animal health and production and animal products" priorities in AFRI. The Managers intend that the term "conventional breeding," also known as "classical breeding," refer to breeding techniques which rely on creating an organism with desirable traits through controlled mating and selection. Because conventional breeding is critical to the development of seeds and breeds that are well adapted to local conditions and changing environmental constraints, these efforts are important to the food and agriculture sector. The Managers are aware that participatory breeding programs, where producers are involved in the process of developing new plant varieties and animal breeds, yield varieties and breeds that are better adapted to local environments. The Managers encourage an emphasis on funding of conventional plant and animal breeding as part of the new AFRI."

For FY 09, these two new 2008 Farm Bill areas were not given their own national program and were instead shoehorned into existing national program areas. This was understandable for the first, rushed year under the new statute, but needs to become two separate stand alone national AFRI programs starting with the FY 2010 request.

Also, when implementing the matching requirement provisions of the AFRI, we encourage CSREES to recognize that even though the cultivars developed may be commodity-specific and local/regional in nature, the development of public germplasm is a public good, serving larger societal goals of diversity and agricultural security. Where a clear public good can be demonstrated, the matching requirements should be waived or made more flexible.

2. REE should track funding of all research (both through ARS and CSREES) from conventional breeding activities separately from genomic or molecular genetics activities. In this way, the funding trends will be more easily monitored and analyzed. Congress has several times requested this information, but reporting has been hampered by a tracking system that does not match the information being requested.

3. The National Genetic Resource Program should receive increased financial and personnel support for the collection, preservation, and evaluation of U.S. germplasm collections and increased public access to these rich sources of genetic diversity.

4. The Agricultural Research Service plant and animal national programs should be funded to accelerate long-term research on plant and animal breeding, including the development of finished varieties, with a particular view to assisting with the goal of helping to create a more sustainable, climate-friendly agriculture.

BACKGROUND -- Classical Plant and Animal Breeding

Classical plant and animal breeding are among the most powerful technologies available to modern agriculture. For over a hundred years these technologies have fueled the engine of American productivity and they have the power to continue to deliver for tomorrow's farmers and ranchers. Classical breeding works because it allows scientists to select for traits that depend on many genes working together. So far, classical breeding deals better than any other

technology with the multi-gene traits like yield and stress tolerance that are fundamental to productive and resilient agriculture. A great example is corn yields, which for decades have been increasing at around two percent a year, largely as a result of classical breeding.

At one time, USDA-funded research was a fountain of new varieties of classically bred plants and animals freely available to the nation's farmers. Unfortunately, two trends are now threatening to reduce that fountain to a trickle. One is the trend toward the extensive privatization of agricultural research. The other is the dramatic decline in public funding of classical methods in favor of newer technologies based in molecular biology and genomics.

Across the nation, once-strong public plant and animal breeding programs at our land grant universities have atrophied. Routinely, as the conventional/classical breeders retire, their positions are not being refilled. New positions in the field are not being created. Graduate student interest is declining because of fewer faculty resources, and fewer research opportunities. In contrast, new positions in the field of genomic or molecular genetics are on the upswing, and graduate student interest is being redirected into these and related areas. These trends are taking place because of the accurate perception of a decline in resources for conventional/classical plant and animal breeding, and the false perception that plant and animal breeding is outmoded or even obsolete relative to its genomics cousin.

It is essential to producers that we revive and reinvigorate the *public* agricultural research sector to enrich the array of classically bred plants and animals. These varieties would be a boon to all of agriculture but are especially needed by the nation's organic and sustainable farmers and ranchers, who are among the nation's most innovative producers. But these farmers and ranchers cannot thrive without a constant infusion of new varieties of plants and animals developed explicitly for their systems.

Ranchers who want to capitalize on the growing demand for pasture-raised beef, for example, are handicapped if they have to use cattle bred for the feedlot. They need new breeds of cattle specially bred to survive on pasture and convert grass to tender, tasty beef. Similarly, organic farmers need crops bred to fit into rotations or to grow well without artificial fertilizers. Such improved varieties are unlikely to come from private industry, which is often narrowly focused on major commodity crops in conventional systems. Classical breeders are the ones who can provide these improved animals and crops.

In addition, many farmers are either prohibited from using genetically modified germplasm (in the case of organic farmers), or choose not to do so because of conflicts with their cropping systems (in the case of many sustainable farmers). Yet with the development of fewer and fewer publicly available cultivars, these farmers are finding it increasingly hard to find the seeds and breeds that meet their needs.

Without the public sector conventional breeding programs to do the on-going work to develop and release locally adapted seed varieties and breeds, these needs will continue to go unmet. Yet concerns about the decline of our public breeding capacity go well beyond the needs of organic and sustainable farmers and consumers. If we continue to allow the consolidation of our germplasm resources into an ever-narrowing pool, we jeopardize our food security in the event

of blight or pathogens. Diversity and adaptability of our seed and animal germplasm is the best precaution against such food security vulnerabilities.

If we do not find a way to reinvigorate the public agricultural sector, the number of plant and animal breeders supporting American agriculture will continue to decline and the stream of new crops and animals adapted to the needs of U.S. farmers will dry up. In addition, we will fall behind major agricultural competitors, like Brazil and India, which are making investments in classical breeding technologies.

U.S. agriculture should not allow its classical breeding establishment to wither away due to benign neglect. To face the uncertain and challenging future, the United States needs a full complement of agricultural science and technologies. That means adding more of the trump cards represented by classical plant and animal breeding—powerful, proven technologies.