Administrative Case for NRSP6, the US Potato Genebank for FY21-25, in a nutshell

1. The Project Proposal on our website (https://www.ars.usda.gov/midwest-area/madison-wi/vegetable-crops-research/people/john-bamberg/bamberg-lab) and NIMSS fully documents the genebank’s growing workload and positive impact of service to SAES scientists. The Review Committee does not dispute the relevance and technical value of the project, but how it is funded. Thus making an administrative case is necessary here:

2. The original intent of NRSPs when created 25 years ago was not to be short-term grants. Even now, NRSP Guidelines clearly say (p. 8) that not all projects must transition off OTT. As a genebank of unique living organisms, NRSP6 qualifies perfectly as such a project. See Appendix E of the project proposal for details.

3. In 2015 we were asked to investigate alternate funding for FY21-25, which developed into a challenge to sunset the project. We did promptly comply, thoroughly exploring every option, but found no practical substitute for the $150K support from NRSP6. OTT is atypical for supporting a genebank, but not inappropriate.

4. Automatic renewal of the project was not expected, only a chance to present a case that accounts for all facts, history and arguments. The project has worked well as OTT for 70 years. Fifteen years ago there was an initiative to drop the project using exactly the same arguments, but this was eventually recognized as a mistake and reversed. We detect no good argument for why the demise of the project or a major structural change must be the default decision at this time.

5. Project staff are not alone in supporting renewal of NRSP6. Twelve prominent leaders in SAES, ARS, and industry potato breeders; RPIS and international germplasm managers and developers; potato farmers; and senior NIFA officials reviewed the proposal. They specifically remarked that forcing a transition to alternate funding was likely to damage the program, and unanimously recommended continuing the status quo.

6. In 2010, the directors mandated we show significant industry support, and we have satisfied that requirement ever since. Industry is already doing their part.

7. The NRSP6 budget has been flat for 25 years, and the Wisconsin host has removed substantial support over the past 10 years. We have already been steadily transitioning away from SAES contributions to the partnership. MRF is only about 1/5 of the budget, similar to the RPIS. NRSP6 does not cost too much.

8. ARS’s share of funding the genebank has steadily increased. One might expect service to states to have declined. But no-- states continue to be full equal partners in every way. Continuing NRSP6 is a very good deal with a high ROI for states, and getting better.

9. SAES scientists will continue to need and get the genebank’s service that they cannot provide for themselves or get from anyone else in FY21-25, even if their states decide to vote down NRSP6. Nobody wants to be that guy who comes to the potluck empty handed, enjoys a great meal, and leaves it to his mates to cover. More importantly, such small short-term savings undermine the broad, long-term benefits of cooperation.

10. The investigation mandated by the directors in 2015 has reached the conclusion that NRSP6 is the kind of project that fits a model of ongoing support used by the RPIS and the ARS partner, already has the most simple and appropriate mechanism, satisfies NRSP guidelines, and at a modest $150K baseline does not put much stress on the 1% OTT budget. If that is not acceptable, we should work to improve lines of communication and start having collegial negotiation toward the best possible alternative. Of course we have no objection to reconfiguration of SAES support as an alternative to OTT, but the risk of negative unintended consequences and the cost of extra work needed to create and administer a new ad hoc multistate scheme should be considered.
Technical Impact Case for NRSP6, the US Potato Genebank for FY21-25, in a nutshell

In recent years breeders have engaged in the revolutionary remaking of potato as a diploid inbred crop. This is only possible because haploidizing technology and selfing mutants were both discovered in NRSP6 germplasm—by NRSP6 staff. And NRSP6 further supported the effort in the current project term by importing valuable new stocks and testing techniques. The ploidy manipulation technique that resulted in Yukon Gold was also developed with NRSP stocks—by NRSP6 staff. Wisconsin cooperators isolated and incorporated the gene providing durable resistance to late blight from a wild species that had been collected in Mexico and preserved and studied in the genebank long before its potential was recognized. Washington state collaborators incorporated potent nematode resistance. In 2017, Idaho cooperators reported incorporation of resistance to greening (responsible for 10-15% waste)—discovered by NRSP6 staff. Cooperators used NRSP6 stocks to develop breeding stocks resistant to verticillium and scab, and donated those back to the genebank. NRSP6 staff helped Oregon State researchers identify germplasm with resistance to nematodes. We produced custom hybrids and propagules to help Industry partners breed lines with much greater levels of an anti-appetite compound aimed at reducing obesity. At least 70% of named US cultivars have our exotic germplasm in their pedigrees. For example, in Wisconsin, of the past 8 cultivar releases from the breeding program, 6 have wild species germplasm as parents obtained directly from NRSP6. NRSP6 staff bred cold tolerant families from which a new cultivar, Wiñay, was released in 2018 in Peru. Sequencing the potato genome depended on the use of genetic stocks from NRSP6 developed by cooperators at Virginia Tech. The revolutionary intragenic Innate potato lines from Simplot in Idaho were developed through the use of exotic germplasm from NRSP6. Two new potato pests—Zebra chip and Dickeya—have become very serious in recent years. In the current NRSP6 project, we have been cooperating with state and federal scientists in Colorado, Texas, New York, and Washington state, screening for and finding potent resistance in exotic germplasm from NRSP6. Folate deficiency causes severe birth defects. With help of NRSP6 staff, state scientists from Oregon identified wild species selections and custom hybrids available only from NRSP6 with high folate and a way to make screening for folate much easier. All these advances would not have been possible using germplasm in the common breeding pool. They needed to be accessed from exotic germplasm. And that exotic germplasm is only available in the USA from NRSP6. These genetic improvements of potato are like golden eggs. It seems risky to propose saving a little money by short-feeding the goose who lays them.

In the past 10 years NRSP6 Annual Reports document 26 released US cultivars with 14 exotic Solanum species’ germplasm in their pedigrees. Again, NRSP6 is the only place in the USA from which breeders can obtain these materials.

In the last 5 years, NRSP6 has seen a 68% increase in items ordered and sent, compared to the previous 5 years. Potato yield is up 8% and production is up 15% compared to a decade ago.

States intend to continue support for dozens of other food crop germplasm collections in the RPIS that have much less germplasm, breeding effort, crop value, and per capita consumption than potato, the nation’s top vegetable. Why single out potato to be dropped? →