Welcome to the Potatoes USA Department of Research 2016 Annual Report! This is the first report since the department’s creation in 2015. Consequently, some of the content below reaches back further than a true annual report, but we had to start somewhere, right?

The progress that we’ve made since March 2015 is undeniable. Existing programs have been brought in-house, future programs are being built, and new relationships are being developed. The underlying goal of these activities is to expand and strengthen the role of research in the potato industry. And who better to take on that project than the grower-based Potatoes USA? We’re in the business of seizing opportunities and facing the known challenges today. But while we do that, we’re keeping an eye on tomorrow to strengthen and unite the industry, making it more versatile and responsive to the unknowns of the future.

To suggest that the ride to this point has been smooth would be inaccurate. In some cases, programs had to be somewhat deconstructed before being rebuilt. But, if you’ve ever looked at a stained-glass window, you know that it didn’t get built without breaking a few panels along the way.

Neither is it true to say that we are finished with our work. While it is satisfying to know that existing research programs are being managed according to the values of Potatoes USA, shouldn’t that have been happening all along?

Yes, we’ve come a good distance in a relatively short period of time, but it is truly exciting to see where we may yet go from here.

Ryan J. Krabill
Director of Research
Potatoes USA
ryan@potatoesusa.com
(303) 873-2319
At the 2016 Potatoes USA Summer Meeting in Seattle, CEO Blair Richardson introduced the concept of an industry-wide committee that would establish national potato research priorities, creating the pathway for greater industry support for aligned research proposals. The group’s ultimate goal is to secure more and diversified research funding for the industry.

The concept was presented within the context of the USDA’s Specialty Crop Research Initiative (SCRI). In the summer of 2016, USDA announced $36 million in SCRI research awards, none of which went toward potato research despite the consideration of several potato-related research proposals and the potato’s status as the nation’s most popular vegetable.

Shortly after the summer meeting, representatives from the National Potato Council, the Potatoes USA Research Committee, and the council of state potato organization managers were named to the Potato Research Advisory Committee, or PRAC. The group held its first meeting in October by teleconference, where the bacterial pathogen *Dickeya* was identified as the top research priority for the industry. Subsequently, a SCRI proposal to address soft rot issues associated with *Dickeya* and *Pectobacterium* was submitted by Dr. Amy Charkowski at Colorado State University. The proposal has advanced to the late stages of consideration at the U.S. Department of Agriculture, but a final determination will not be made until this summer.

Members of PRAC met again on February 13, 2017, in Washington, D.C., during the NPC’s Potato D.C. Fly-In. In addition to discussing future potato research priorities, they also began the process of further defining the long-term role of PRAC and learning about potential future USDA research funding opportunities. The committee is planning to meet again during the 2017 NPC Summer Meeting in Denver, Colorado.
Last spring, Potatoes USA took the monumental step of modernizing the way in which data generated in its variety development programs are gathered, stored and made available to growers, processors and breeders. In cooperation with Medius Ag—an agricultural software engineering company in Pennsylvania—Potatoes USA developed the Variety Data Management System, or VDM.

Prior to the existence of the VDM, the primary tools used for the tracking, sorting and analysis of data were spreadsheet programs. Now, data generated through the National Chip Program, for example, can be narrowed by any number of filters from disease resistance to fry color.

Individual users are able to establish their own unique settings within the program so that they can keep a close eye on varieties of interest to them. Another key feature available is the ability of a user to filter criteria, allowing him or her to identify clones possessing specific characteristics. Users are even able to access photographs (if available) of clone samples out of the field and/or after processing. Perhaps the most valuable feature of the VDM is its ability to facilitate the time-consuming variety selection process by empowering program stakeholders with easily accessible, informative data that standardizes clone performance across dozens of variables.

The implementation of the VDM has been warmly greeted by those in the industry who have seen its value first-hand, recognizing that it provides an important tool to the industry that was previously lacking. As a result, Potatoes USA is in the early stages of expanding the VDM to include data from the National Fry Processor Trials (NFPT) program. NFPT stakeholders even relied on a beta version of the program to make clone selections for 2017. It is important to note that a user must register for access to the NFPT data.

You may register for and access the program at https://potatoesusa.mediusag.com.
## 2016 NFPT Clones Undergo Testing

In 2016, the National Fry Processor Trials (NFPT) included 44 unnamed clones. Each of the clones were grown at five trial locations: Washington, Idaho, North Dakota, Wisconsin, and Maine. At each location, Russet Burbank and Ranger Russet samples served as check material.

Of the 44 clones, 27 of them were in the NFPT program for the first time. Nine clones were in the program for a second year, three for a third year, four a fourth year, and one was entered for its sixth year. The clones came from seven breeding programs in the United States, including Colorado State University, USDA Agricultural Research Service (USDA ARS)-Aberdeen (ID), the University of Maine, North Dakota State University, Oregon State University, Texas A&M University, and the University of Wisconsin.

Upon harvest, the samples were shipped to the USDA-ARS Potato Research Worksite facility in East Grand Forks, Minnesota, where they were prepared for observation during the NFPT Field Day in mid-October. NFPT Field Day attendees represented processors, state potato organizations, breeding programs, and McDonald’s. Attendees participated in a blind evaluation and scored the NFPT samples on appearance attributes including length, shape, and size distribution.

The scoring results from the NFPT Field Day were added to data generated during the trials to give a more comprehensive view of how each clone performed at each trial location. In early January, using this information the NFPT Steering Committee selected 55 samples representing 29 clones from across the five states for additional post-harvest analysis of acrylamide. The group will be further refined based upon the acrylamide data for additional processor analysis, which is the most informative—and most expensive—test of how a clone may perform in final product form.

For full results, please visit [potatoesusa.mediusag.com](http://potatoesusa.mediusag.com). Please note that you will need to complete a free registration to see the NFPT data.

### 2016 NFPT Clones

<table>
<thead>
<tr>
<th>University of Maine</th>
<th>North Dakota State University</th>
<th>Texas A&amp;M University</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAF07521-1*</td>
<td>ND050052-4Russ*</td>
<td>COTX09022-3RuRE/Y</td>
</tr>
<tr>
<td>AF5071-2*</td>
<td>ND070927-2Russ*</td>
<td>COTX09052-2Ru*</td>
</tr>
<tr>
<td>AF5091-8*</td>
<td>ND09193BR-2Russ*</td>
<td>TX08352-5Ru*</td>
</tr>
<tr>
<td>AF5179-4*</td>
<td>ND092007R-2Russ</td>
<td>TXA549-1Ru*</td>
</tr>
<tr>
<td>AF5406-7*</td>
<td>ND092355CR-2Russ</td>
<td></td>
</tr>
<tr>
<td>AF5407-13*</td>
<td></td>
<td>University of Wisconsin</td>
</tr>
<tr>
<td>AF5469-2</td>
<td></td>
<td>AW06108-1rus</td>
</tr>
<tr>
<td>WAF10051-1RUS</td>
<td></td>
<td>AW07773-1rus*</td>
</tr>
<tr>
<td>WAF10073-3RUS*</td>
<td></td>
<td>AW07791-2rus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>W10594-16rus*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>W9742-3rus*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>W9850-5rus*</td>
</tr>
</tbody>
</table>

* denotes underwent post-harvest testing

**IMPORTANT:** Must be registered at potatoesusa.mediusag.com to view NFPT clones.
In January 2016, Potatoes USA began a concentrated effort to institutionalize the National Chip Program (NCP), culminating in the adoption of the Potatoes USA National Chip Program Operations and Organization handbook during the 2016 Annual Meeting. The effort heavily relied upon the leadership of the Potatoes USA Chip Committee for background information and to provide a vision for the program’s future. At the conclusion of the project, guidance for the future execution of the NCP was formalized and made available in writing for the first time in the program’s history.

The NCP is primarily focused on the coordination of variety development activities at breeding programs across the country. Through the identification and commercialization of emerging chip potato clones, the chip sector is strengthened through the enhancement of raw product. This ultimately benefits consumers by providing them with the best quality potato chips year-round. The program begins with roughly 150 potato clones each year and steadily narrows down the number of remaining clones to about 15 over the course of five years. At the end of the five-year period, only the clones that exhibit the most promise in commercial growing settings continue on to the commercialization phase. The NCP program cuts in half the time it would otherwise take the industry to bring a new variety to market, or about 7-8 years versus 15 years.

One of the more notable actions resulting from the publication of the NCP handbook was the streamlining of the Chip Committee to include a Steering Committee to help provide overall guidance and a Technical Advisory Committee to assist with variety selection decisions. This approach replaced a Chip Committee structure that had previously included three subcommittees, an advisory panel, and a task force. At the 2017 Winter Chip Meeting in San Francisco, new Steering Committee officers and members were elected and installed for the first time since 2014.

Following the approval of the NCP handbook in March 2016, Potatoes USA went to work developing the job descriptions for the many individuals involved in the program. The job descriptions outline the responsibilities for everyone involved in the program from volunteers serving on the Chip Committee to paid Potatoes USA staff and contractors.

The development of the NCP handbook and the subsequent activities it spawned did not mark the end of improvements made to the program, however. In the spring of 2016, Potatoes USA worked with agriculture database developers to implement the Variety Data Management (VDM) System that will revolutionize the way in which the sector—from breeders to processors—will look at and analyze data and photos generated in the NCP. The VDM program went live on July 1, 2016 and proved to be a critical tool six months later when the clones for the upcoming 2017 crop year were selected.
Potatoes USA continues to be actively involved in the Alliance for Potato Research & Education (APRE) following a year of substantial changes within the organization. Chairman Mike Pink joined the APRE Board of Directors in August 2016, joining CEO Blair Richardson and Idaho grower Dan Moss as grower representatives of the U.S. potato industry.

Also in August, staff support for APRE was strengthened with the retention of FoodMinds, a food and nutrition communications and consulting firm with significant experience at the intersection of nutrition public policy and research. Additionally, the FoodMinds team brought an impressive network of nutrition experts throughout the United States and world to the expanding footprint of potato nutrition research. Following a competitive review, FoodMinds was selected by the APRE Board of Directors to implement the next phase of APRE’s strategic plan—featuring an increased emphasis on clinical research—that had been adopted months earlier. Specific APRE research areas of emphasis through 2021 will include: Diabetes, Healthy Weight, Diet Quality, and Heart Health, among other emerging issues.

APRE is a not-for-profit organization 100% dedicated to expanding and translating scientific research into evidence-based policy and education initiatives that recognize the role of all forms of the potato—a nutritious vegetable—in promoting health for all age groups. APRE is actively building the science foundation concerning the nutritional benefits of the white potato; creating partnerships with critical health professional organizations in the United States and Canada; and informing dietitians and health professionals by providing them with the latest scientific research and information on potato nutrition, consumption, and affordability. APRE is a National Strategic Partner with USDA MyPlate and a Produce for Better Health 2015 Champion. For more information, visit www.apre.org.

**APRE 2016 PUBLISHED RESEARCH**

“Nutrient Intake and Vegetable and White Potato Consumption by Children 1-3 Years,” Advances in Nutrition. More Info: http://advances.nutrition.org/content/7/1/241S.full.pdf+html

“Removing Potatoes from Children’s Diets May Compromise Potassium Intake,” Advances in Nutrition. More Info: http://advances.nutrition.org/content/7/1/247S.full.pdf+html

“Physiology of Food Intake Control in Children,” Advances in Nutrition. More Info: http://advances.nutrition.org/content/7/1/232S.full.pdf+html

“Vegetable and Fruit Acceptance During Infancy: Impact of Ontogeny, Genetics and Early Experiences,” Advances in Nutrition. More Info: http://advances.nutrition.org/content/7/1/211S.full.pdf+html


The application deadline for Fiscal Year 2017 Specialty Crop Research Initiative (SCRI) pre-proposals was November 15, 2016. The SCRI program is administered by the U.S. Department of Agriculture’s National Institute of Food and Agriculture (USDA NIFA) and is expected to award $48 million to the most highly scored specialty crop research proposals this year.

Successful SCRI proposals go through two main application steps: the pre-proposal step with the November deadline, and the full proposal step with a deadline of March 1, 2017. Only the pre-proposals judged by industry to be the most relevant are invited by USDA NIFA to submit full proposals. Thus, demonstrated industry support for specific research projects is most critical prior to the pre-proposal deadline. Full proposals undergo a rigorous peer review process after the March 1 deadline.

In October, the newly-formed Potato Research Advisory Committee (PRAC) identified the ongoing Dickeya pathogen as the primary potato research issue. Shortly thereafter, Potatoes USA worked with industry leaders, organizations, and companies to build support for Dr. Amy Charkowski’s SCRI research proposal: “Integrating Next-Generation Technologies for Blackleg and Soft Rot Management in Potato.” If successful, the project may direct more than $4 million in research toward this devastating pathogen—the top priority of the potato industry—over the next five years. Impressively, when Dr. Charkowski’s final pre-proposal was submitted, it was accompanied by 54 industry letters of support across sectors and growing regions.

Potatoes USA also supported a second, smaller SCRI project known as a planning grant that was submitted by Dr. Jeff Endelman at the University of Wisconsin-Madison. The project, “High-Throughput Sensing for Potato Production and Breeding,” received more than 20 industry letters of support and would provide Dr. Endelman’s team $50,000 in preliminary funding to develop a larger project proposal in a later year.

In January 2017, both projects were invited by USDA NIFA to submit full proposals, demonstrating the effectiveness of a unified industry strategy to support strong, relevant research projects. Final award selections based upon the peer reviews of the full proposals are expected to be made in Summer 2017.

For more information on the Specialty Crop Research Initiative, please visit https://nifa.usda.gov/program/specialty-crop-research-initiative-scri.
Throughout 2016, Potatoes USA worked with the National Fry Processor Trials (NFPT) steering committee and trial cooperators to explore improvements to the NFPT program model. When the program was created in 2011, NFPT funding partners agreed to a three-year commitment. Upon the conclusion of the first three-year period, the program stakeholders committed to a second period of three years, concluding at the end of the 2016 crop year. With the program reaching the conclusion of its second three-year period, it was time for a re-evaluation of the program in response to the evolving needs of the industry.

The most significant change to the NFPT program for 2017 is the migration to a tiered program structure. This approach will ensure that the bulk of program resources will be most appropriately directed to the clones that pass a preliminary set of criteria and are poised to perform well in the later, more expensive post-harvest evaluations. Each year, up to 40 clones that are new to the program are selected and automatically entered at Tier 1. Up to 20 clones that exhibit positive attributes in the field will be re-entered in the program at the Tier 2 level the following year for additional field and post-harvest testing. In its third year, a successful clone is entered at the Tier 3 level for field testing, post-harvest analysis, and processor evaluation. The Tier 3 level is limited to 10 clones and represents the final year of eligibility for a clone in the NFPT program.

Another significant change to the 2017 NFPT program is the addition of a sixth trial location in Ontario, Oregon—joining Maine, Wisconsin, North Dakota, Idaho, and Washington. Potatoes USA will also continue to develop its capacity to translate data generated in the NFPT program into actionable recommendations for stakeholders using the Variety Data Management System. As a result, data and information generated across the six trial locations and during subsequent post-harvest testing and analysis activities will continue to be improved, standardized, and more rapidly executed to enhance decision-making. As the NFPT program begins its seventh year in operation, Potatoes USA will continue to work with processors and other leaders within the sector to make the program more responsive to the unique needs and dynamics of the fry sector. Ultimately, these steps to institutionalize the program will lead to continued investment in and commitment to the program by processors, state organizations, and breeding programs across the country.
POTATOES USA FULFILLS 5-YEAR SCRI FUNDING OBLIGATION

In August, Potatoes USA certified its fulfillment of a substantial financial commitment in support of the acrylamide research project spearheaded by the University of Wisconsin (UW). The project, administered under the U.S. Department of Agriculture’s Specialty Crop Research Initiative (SCRI), was awarded to UW faculty in 2011 and predicated on a dollar-for-dollar industry match. The U.S. Potato Board, as it was known at the time, committed to providing the industry financial support necessary to make the research project a reality. The itemized report tracked more than $4 million in research expenditures from September 1, 2011 – August 31, 2016 in support of “Improved Breeding and Variety Evaluation Methods to Reduce Acrylamide Content and Increase Quality in Processed Potatoes.”

The funds were used to facilitate variety trials in both the National Chip Program and the National Fry Processor Trials (NFPT) and associated post-harvest testing. The funds enabled the NFPT program to expand from the original states of Idaho, North Dakota and Washington to include Wisconsin and Maine.

The SCRI program was created in 2008 by Congress when the Food, Conservation, and Energy Act, commonly known as the 2008 Farm Bill, was passed by Congress. It included $230 million in initial total funding from 2008 – 2012. The provision was retained in the subsequent Agricultural Act of 2014 (the 2014 Farm Bill) but with a modest funding increase of about $5 million per year.

Additional project information is available here:
http://cris.nifa.usda.gov/cgi-bin/starfinder/0?path=fastlink1.txt&id=anon&pass=&search=R=49065&format=WEBLINK

RESEARCH MOVES TO NEW PROGRAM BUDGET STRUCTURE

In early 2017, Potatoes USA Research streamlined the structure of the department budget. Although a seemingly fundamental or simple task, it represents a significant step forward that was only accomplished with the assistance of Potatoes USA’s Department of Finance and Policy.

Revenue for the Research Department historically comes from three sources: grower assessments, voluntary processor contributions, and the sale of seed from the National Chip Program. Because of the varied origins of Potatoes USA Research funding, budget development and tracking prior to the budgetary realignment varied by revenue source. Under the new structure, while revenues continue to be maintained separately according to source (assessment, contribution, or auction), it has been standardized so that budget tracking activities can be conducted more quickly and accurately than ever before.
In 2015, the U.S. Department of Agriculture’s National Institute of Food and Agriculture (NIFA) awarded $3.2 million to study nematodes through its competitive grant program. The proposal—“Risk Assessment and Eradication of *Globodera* spp. in U.S. Potato Production”—is referred to as the “GLOBAL Project”, where GLOBAL is short for *Globodera* Alliance. GLOBAL is a research team of nematode experts from around the world committed to improving the potato industry’s ability to ultimately eliminate nematodes detrimental to potato production.

Upon the project’s approval, coordinators sought industry representatives from key areas and organizations, including Potatoes USA, to serve on the project’s advisory board. As a member of the GLOBAL Advisory Board, Potatoes USA is able to exhibit its leadership through its support for research projects essential to the industry and to illustrate the importance of grower organization involvement.

For more information on the GLOBAL project, please visit https://www.globodera.org/.