

SAN LUIS VALLEY RESEARCH CENTER – INDUSTRY WORKSHOP SUMMARY

Colorado State University
Colorado Agricultural Experiment Station
San Luis Valley Research Center
January 26, 2015

EXECUTIVE SUMMARY

The purpose for the workshop was to identify the most significant challenges the San Luis Valley potato industry faces that can be addressed by research within the mission of the Colorado Agricultural Experiment Station and the San Luis Valley Research Center (SLVRC).

The information gained from the breakout sessions will be used to help the Colorado Potato Administrative Committee Research Committee, the Colorado Certified Potato Growers Association, and Colorado State University (CSU) design a collaborative research action plan that gives priorities to needs and identifies partners and resources that can be used to help accelerate the finding of solutions to the challenges industry face in the near and longer term horizons.

Seven general challenges were identified that included: production efficiency, potato consumption, disease control, water use, insect pest control, potato storage, and weed control. The participants also gave perspectives and insights of possible approaches that could be useful for finding solutions to the most pressing challenges. The kinds of useful products that the participants would like to see produced were defined.

BACKGROUND

The industry workshop participants were first briefed on some of the research capacities of faculty from the San Luis Valley Research Center and on the CSU Fort Collins campus¹. The participants then gave their perspectives in two facilitated breakout sessions that were led by SLVRC faculty in which they identified and prioritized their greatest challenges, determined which of these could be solved by research, and categorized their need for solutions based on short-term, medium-term, or on-going/long-term solution horizons.

The information from the breakout sessions was recorded for each group, and the results summarized to produce a list of seven general challenges that the participants considered to be problems that needed research attention (Table 1). The general challenges were comprised of interpreted groupings of similar kinds of issues that were given by the participants in their breakout groups. The rankings of the challenges are given as a starting place for discussion. More specific researchable problems will need to be defined. The participants also gave perspectives and insights of possible approaches

¹ Colorado State University SLVRC and Fort Collins faculty who gave presentations included: David Holm, Samuel Essah, Andrew Houser, Sastry Jayanty, Courtney Jahn, Troy Bauder, and Adam Heuberger.

that could be useful for finding solutions to the most pressing challenges. The kinds of useful products that the participants would like to see produced were defined. Finally, a few non-researchable issues were identified and presented for the completeness of this record.

Table 1. Summary of general challenges identified by participants in the breakout sessions. The general challenges are interpreted groupings of similar kinds of issues that were given by the participants in each of the four breakout groups.

General Challenge	Group 1	Group 2	Group 3	Group 4	Totals Responses
Production Efficiency	2	13	14	15	44
Potato Consumption	7	13	5	11	38
Disease Control	4	7	9	9	29
Water Use	6	7	4	2	19
Insect Pest Control	3	0	0	9	12
Potato Storage	1	0	4	0	5
Weed Control	0	0	0	1	1

DISCUSSION

Following are descriptions of the *General Challenges* that were listed in Table 1, based on the different kinds of issues that were recorded in the breakout groups.

PRODUCTION EFFICIENCY. Production Efficiency had the greatest number of responses, but is due to the broad range of topics that were grouped into this challenge. Included were the need to identify profitable crops that can be used in rotation with potatoes, and use of cover and green manure crops to improve soil health and control weeds – there was an overarching recognition for the need for practices that enhance soil health. The only specific alternative crops mentioned were hops and hemp, along with an emphasis on profitability. Also included were the need for organic vine kill materials. Some participants recognized the need to increase the efficiency of production systems through more optimal in-season management practices. It can be assumed that this would include use of precision applications of water and nutrients, and use of integrated pest management principles (these can be also considered as responses for researchable topics in other general challenge areas).

POTATO CONSUMPTION. The participants widely recognized that there has been a decline in consumer purchases and that greater potato consumption is needed to support potato production and markets. The topics grouped under potato consumption included: need for nutritional information of potatoes and documentation of the health benefits of specialty potato varieties to support marketing claims and the use of branding in marketing, the need for marketing education for retailers and consumers, and the need

to address consumer resistance to crop improvement through the use of genetically modified organism (GMO) technologies. Presently no GMO technology is used in CSU potato research, but the future role of GMO's in advancing the potato industry was seen as needed in the future. One participant expressed an opinion that addressing public opinion about GMO is a higher priority than using GMO technology for traits that benefit the grower. There was also mention of the need for development of new products, and need for new packaging of potatoes. CSU was recognized as having the capacity to do research that could be used to substantiate health and other claims for marketing.

DISEASE CONTROL. The aspects of disease control that were highly ranked by the four groups were: need for disease-resistant varieties and the ability have early screening methods that are predictive of the variety's reaction to disease; nematodes; Potato Virus Y (PVY); and other potato diseases including soil-borne ones. Specific diseases mentioned were: powdery scab, moptop, TRV, pink rot, corky ring spot, and tobacco rattle virus (with mention of need for grower education). There was specific mention of need for resistant varieties, chemical disease controls, and isolation distance for PVY.

WATER USE. There was broad recognition that there need to be ways for potato growers to be more water-use efficient. Ways to accomplish greater water use efficiency included breeding for water use efficiency and tolerance to reduced water application amounts; increasing soil water holding capacity using bio-materials; the use of potato rotations that in total use less water; using different hill shape configurations to reduce water use; improving water management through irrigation management and the use of technologies such as drip and variable rate applications; and the need for grower education. The need for SLVRC researchers to cooperate with other water researchers and organizations was highlighted. A general use of the term sustainability was used in conjunction with water use efficiency.

INSECT PEST CONTROL. There was a balance expressed for the need for alternative insect pest measures including biological pest control, as well the need for new registered chemical control products. The challenge of chemical resistance was also recognized, as was potato being on the "dirty" list of food crops that have pesticide residues carried into the market. The need for integrated pest management (IPM) approaches was highlighted, and the need for cost effective ways to control the insects that are vectors of disease. The need for management of insect pests with predator insects was recognized, and the need to manage habitats for predators.

POTATO STORAGE. Challenges related to potato storage included diseases specific to storage conditions, pressure bruising in storage, and potato breakdown in storage. (Issues identified that related to post-harvest handling and quality in retail stores is considered under potato consumption.)

WEEDS. Only one participant identified a specific weed challenge as an important topic to be researched. Nightshade was cited as a disease host that causes a problem. The need for cover crops that can be used to control weeds was also highlighted, and included as a strategy for increasing production efficiency. Weed control is included to give a full

perspective of the kinds and relative importance of the different challenges that were identified.

The participants also gave perspectives and insights of possible approaches that could be useful for finding solutions to the most pressing challenges. Suggested approaches for finding solutions included:

- Grower participation in the research, including taking research and testing it in on-farm trials
- Grower directed research
- Marketing research
- Post-harvest handling and quality research in retail stores
- New technologies to reduce the development time for new varieties
- Collaborate with other institutions including local consulting firms, local water groups, USDA Natural Resources Conservation Service
- Advanced methods to rapidly screen for diseases, along with early detection
- Tracking of insect vectors before trials are conducted (assume PVY)
- On-farm visits
- Variable rate irrigation
- Drip irrigation
- Appropriate literature reviews
- Modeling

The kinds of useful products that the participants would like to see produced included:

- Variety management sheets
- Website information
- More yellow-flesh cultivars
- Red potatoes that retain color in the valley
- Early Russets varieties with resistance
- Two-page research summaries in English measures
- Cooperators should be given their own full report
- Publish information in popular outlets
- Information useful for sustainability labeling (need a clear definition of sustainability) – development of best management practices
- Information that can be used to inform the development of policies
- Science-based information to substantiate health claims – increase consumer acceptance of potatoes

Non-researchable challenges that were identified:

- Regulatory issues
- Need for petiole testing and other laboratory services
- Water recharge facilities
- Need for potato storage extension and management help

NEXT STEPS IN THE PLANNING PROCESS

At the conclusion of the industry listening workshop at Alamosa, Jim Ehrlich and Jeff Steiner outlined the next steps for action. A summary of the proposed pathway forward for developing a cooperative research action plan for the potato industry is shown in the figure to the left. The results from the breakout sessions would be summarized by CSU, a summary of the industry challenges would be reviewed by the Potato Research Committee, and then greater input would be sought from a broader group of producers and allied industry members, possibly at the Southern Rocky Mountain Agricultural Conference. Following the process of gathering input from a broader customer and stakeholder representation as to the most significant challenges the industry faces, a *Cooperative Research Action*

Moving the Planning Process Forward



Plan will be developed by CSU in cooperation with the potato industry, utilizing the input received from customer listening sessions. The action plan will provide an overview of the resources needed to accomplish the work, the definition of research approaches and roles of different partners, and the expected results and products that will be produced from the research.

After the discussion of the summary results from the customer listening workshop with the Potato Research Committee, further steps will need to be established for actions towards the development of the cooperative research plan. Shown in the next figure below are the cycle of steps required for developing, implementing, and reviewing a research project. The cycle includes

Development Cycle for Research Projects



priority setting and research planning, research project plan review, launching the research project, ongoing research project coordination, and periodic review and assessment of the project progress and reporting of accomplishments.

Using the research project planning process cycle helps to assure that the supported research is relevant and has buy-in from our customers, is being conducted using the best methods and knowledge of the science that is available, formally allows for periodic review of progress and performance, and assesses accomplishments and impacts – its purpose is to produce results.

The research project cycle will be discussed with the Research Committee as a framework to assist with designing cooperative research projects. The research project cycle can be used to consider the perspectives and insights of our customers for possible approaches that could be useful for finding solutions to specific challenges, and to specify the kinds of useful products that the participants would like to see produced by their research investment.

WORKSHOP AGENDA

**CSU San Luis Valley Research Center – Industry Workshop
Adams State University – Alamosa, Colorado
October 27, 2014**

<i>Workshop Opening</i>	
8:30 a.m. to 9:00 a.m.	Registration
9:00 a.m. to 9:15 a.m.	Welcome and Introductions <i>Jim Ehrlich, Executive Director Colorado Potato Administrative Committee</i> <i>Jeff Steiner, Deputy Director Colorado Agricultural Experiment Station</i>
<i>Colorado Agricultural Experiment Station Investments</i>	
Briefs on SLVRC Programs	
9:15 a.m. to 9:35 a.m.	Potato Breeding and Cultivar Development for Colorado <i>David Holm</i>
9:35 a.m. to 10:55 a.m.	Sustainable Potato Production <i>Samuel Essah</i>
9:55 a.m. to 10:15 a.m.	Potato Pathology and Disease <i>Andrew Houser</i>
10:15 a.m. to 10:35 a.m.	Potato Quality and Storage <i>Sastry Jayanty</i>
10:35 a.m. to 10:50 a.m.	New Screening Tools for Production Efficiency <i>Courtney Jahn, Bioagricultural Science and Pest Management and David Holm</i>
10:50 a.m. to 11:05 a.m.	Water and Potatoes <i>Troy Bauder, Soil and Crop Science and Samuel Essah</i>
11:05 a.m. to 11:20 a.m.	Improved Nutrition of Colorado Potatoes <i>Adam Heuberger, Horticulture and Landscape Architecture and Sastry Jayanty</i>
11:30 a.m. to 11:40 a.m.	Break and Transition to Breakout Session Areas

Industry Focus Sessions

<p>11:40 a.m. to 12:40 p.m.</p> <p>Breakout Groups:</p> <p style="margin-left: 20px;">Group 1</p> <p style="margin-left: 20px;">Group 2</p> <p style="margin-left: 20px;">Group 3</p> <p style="margin-left: 20px;">Group 4</p>	<p>Breakout Session I: Customer identification of personal and industry-wide highest-priority needs.</p> <ul style="list-style-type: none"> • List in order of greatest need, all challenges that require solutions for your business to succeed. • Determine whether each highest priority need has a possible research solution. • Identify other possible kinds of approaches and solutions that could address those needs. <p>CSU Leader 1 – Holm/Gray</p> <p>CSU Leader 2 – Jayanty/Kalita</p> <p>CSU Leader 3 – Bauder/Essah</p> <p>CSU Leader 4 – Houser/Sather</p>
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Workshop Lunch

Colorado AES and CPAC Investments in San Luis Valley Research Center

<p>12:40 p.m. to 1:30 p.m.</p>	<p>Presentation: Administrative Updates on SLVRC <i>Ryan Abbott, Assistant Director Colorado AES and Interim Manager of SLVRC</i></p>
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Customer Focus Session (continued)

<p>1:30 p.m. to 2:10 p.m.</p> <p>Breakout Groups:</p> <p style="margin-left: 20px;">Group 1</p> <p style="margin-left: 20px;">Group 2</p> <p style="margin-left: 20px;">Group 3</p> <p style="margin-left: 20px;">Group 4</p>	<p>Breakout Session II: Prioritization of research needs and alignment of resources to produce solutions.</p> <ul style="list-style-type: none"> • Prioritize research needs and categorize these based on short-term, medium-term, or on-going/long-term horizons – if there are disagreements, indicate where so. • Identify specific research products that you need delivered to help solve the identified challenge. • Indicate where strategic partnership opportunities exist or could be formed to help accelerate progress towards solutions. <p>CSU Leader 1 – Holm/Gray</p> <p>CSU Leader 2 – Jayanty/Kalita</p> <p>CSU Leader 3 – Bauder/Essah</p> <p>CSU Leader 4 – Houser/Sather</p>
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<p>2:15 p.m. to 2:45 p.m.</p>	<p>Report-out from Breakout Sessions I & II: Reporting of results</p>
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<p>Breakout Groups:</p> <p>Group 1</p> <p>Group 2</p> <p>Group 3</p> <p>Group 4</p>	<p>from the two earlier breakout sessions. These results will be used by CPAC, CCPGA, and CSU to develop a cooperative research action plan.</p> <ul style="list-style-type: none"> • Research needs and rankings by time horizons. • Industry-specified products produced by research. • Present and potential new partnerships. <p>Industry Spokesperson 1</p> <p>Industry Spokesperson 2</p> <p>Industry Spokesperson 3</p> <p>Industry Spokesperson 4</p>
<p>2:45 p.m. to 3:00 p.m.</p>	<p>Next Steps Discussion <i>Jim Ehrlich and Jeff Steiner</i></p>
<p>3:00 p.m.</p>	<p>Workshop Dismissed <i>Jim Ehrlich and Jeff Steiner</i></p>
<p><i>Customer Session Adjourned</i></p>	
<p>3:30 a.m. to 4:00 p.m.</p>	<p>CPAC, CCPGA, and AES Workshop Debriefing</p>
<p>No Host Dinner TBD</p>	