

## AGRICULTURAL RESEARCH FOUNDATION

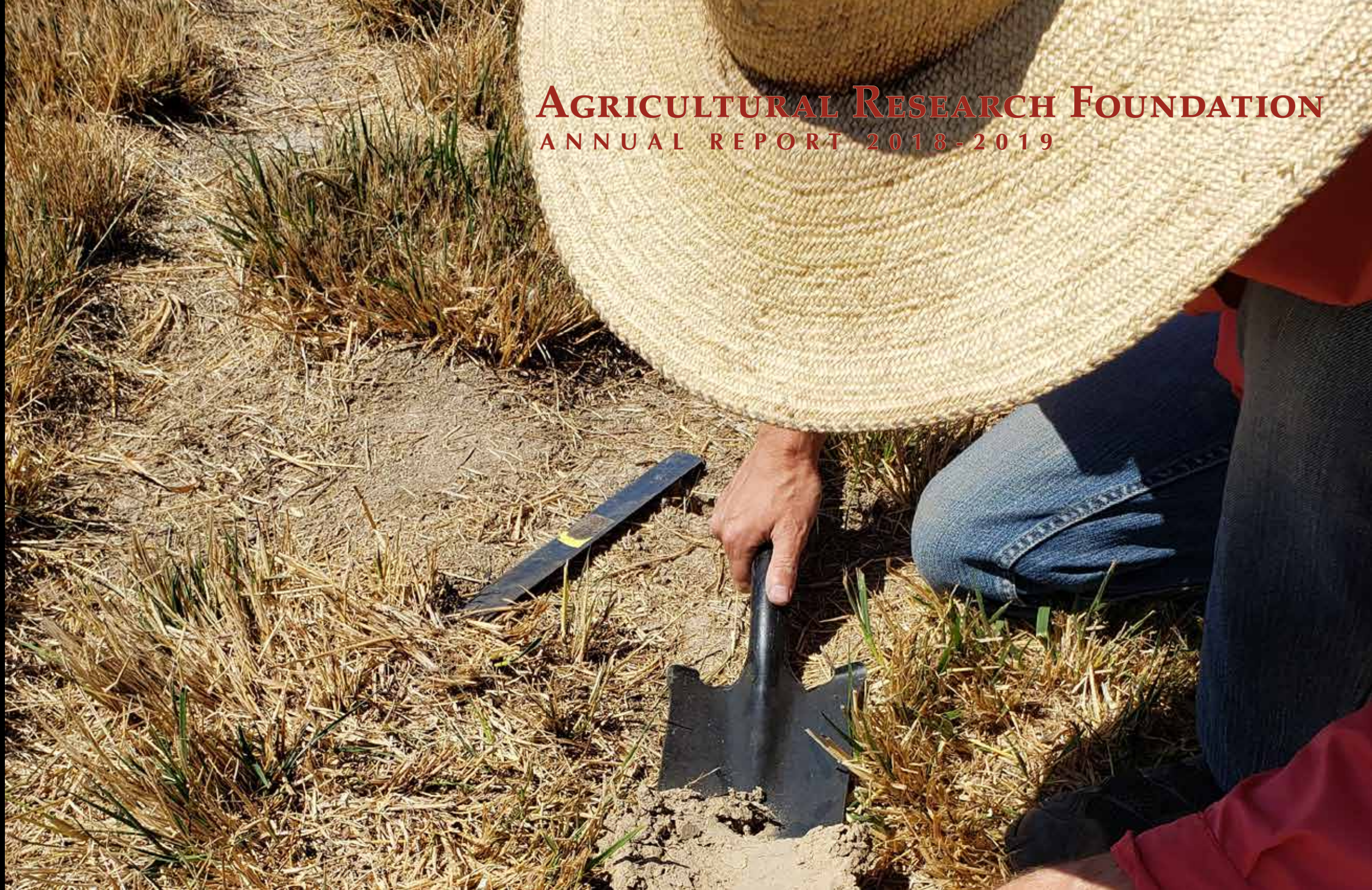
1600 SW Western Blvd, Suite 320  
Corvallis, Oregon 97333  
P 541-737-3228

The Agricultural Research Foundation is a nonprofit 501(c)3 corporation. Gifts and charitable bequests to the Foundation are deductible and can help accrue tax benefits.

<http://agresearchfoundation.oregonstate.edu>

## AGRICULTURAL RESEARCH FOUNDATION

### ANNUAL REPORT 2018-2019





## President's Message

# 2018-2019 ARF Annual Report

Greetings from the OSU Agricultural Research Foundation (ARF). This annual report is a reflection of Foundation activities from July 1, 2018 through June 30, 2019. In my remarks, I will reflect on activities of the past year and look forward to the coming year.

The mission of ARF is to act as a holder of funds for agricultural and natural resource industries. We receive funds from donor partners and allocate them to the researchers as designated. We invest these funds

and with the strong economy of the past couple of years, our general fund has shown significant growth.

ARF budgets and funds a competitive grants research program with its general fund. In the past, the Board of Directors has allocated \$450,000, or slightly more, to researchers with a cap of \$12,500 per grant. The purpose of the grants program is to help launch the careers of newer OSU faculty and to provide jump-start funding for novel idea research.

I am pleased to announce that because of our strong growth the past several years, we are able to increase the amount allocated to \$550,000 and the amount awarded to \$15,000. Allocation of these funds will be made in January 2020. Results of past funded and completed research projects are available on the ARF webpage.

Dr. Russ Karow has been Executive Director of ARF for the past four and a half years. In the fall of 2018, he notified the Board of

Directors of his intent to move to full retirement status. Dr. Karow and his family came to OSU in the fall of 1983. He served OSU and Oregon agriculture as an extension agronomist and Department Head of Crop and Soil Science prior to his time with ARF. Many thanks to Russ for his 36 plus years of service to agriculture and farmers of Oregon.

On behalf of the Board of Directors, I am pleased to welcome Dr. Dan Arp as our Executive Director. Dr. Arp recently retired as

the Dean of the College Agricultural Sciences at Oregon State University. The Executive Director transition is in progress with Dr. Arp assuming the helm on January 1, 2020.

Jianli Zhu began in September of 2019 as our Finance Director. She comes to us with a strong background in accounting and financial management. She replaces Meredith Wade who has relocated to California with her family. Thank you Meredith for your time and contributions to ARF.

Charlene Wilkerson is in her fifteenth year with ARF and serves as our very capable Office Manager. Thank you Charlene for your many years of dedicated service.

It is our staff past and future that makes ARF function efficiently. Thank you to them all. They make the job of the officers and the Board of Directors easy.

Till next year. GO BEAVS

**Ralph Fisher**, President

# 2018-19 Agricultural Research Foundation Directors

Today’s ARF Directors and Officers, like the founders of the organization, are volunteers. They are chosen to represent the diversity of Oregon’s agricultural and natural resource industries. They give generously of their time and expertise in setting policy and monitoring results from Foundation projects. The directors meet bi-annually to review budgets, analyze Foundation activities of the past year, and plan programs for the next.

## Officers

### President

Ralph Fisher  
*Sublimity, Grass Seed*

### Vice Presidents

Lance Lyon  
*Aurora, Nursery Industry*

Ron Hathaway  
*Klamath Falls, Professor Emeritus  
Extension - Animal Science*

### Treasurer/Secretary

Josh Kvidt (through Nov 1)  
*Philomath, Banking*

Chelle Davis (from Nov 2)  
*Albany, Banking*

## Directors

Arnold Appleby (through Dec 6)  
*Corvallis, Professor Emeritus  
Crop & Soil Science, OSU*

Dan Arp (from Sept 1)  
*Corvallis, Dean Emeritus  
College of Agricultural Sciences, OSU*

Robert Bailey  
*The Dalles, Tree Fruits*

David Beck  
*Amity, Wine Industry*

Barbara Bond

*Amity, Professor Emeritus  
Forest Ecosystems & Society, OSU*

Stella Coakley  
*Corvallis, Assoc. Dean Emeritus  
College of Agricultural Sciences, OSU*

Mike Hessel  
*Shedd, Fresh Market Vegetables  
and Melons*

Tami Kerr  
*Corvallis, Dairy Industry*

Elizabeth Levi  
*Portland, Attorney*

Dan LoFaro (through Nov 2)  
*Farm Service Agency, Portland*

Mike Macnab  
*Portland, Retired Non-profit Executive  
Wheat Rancher*

Pat Malone  
*Philomath, Christmas Trees  
Benton County Commissioner*

Jean McKinney  
*Wasco, Wheat Rancher*

Bryan Ostlund  
*Salem, Commodity Commissions  
Administration*

Fred Postlewait  
*Newport, Banking*

Brenda Powell  
*Corvallis, Retail Nursery  
& Garden Center*

Shelly Sorem  
*Corvallis, CPA*

Edwin Stastny, Jr.  
*Malin, Irrigated Crops*

Bud Weiser  
*Corvallis, Dean Emeritus  
College of Agricultural Sciences, OSU*

Committees

**Audit**

Brenda Powell, Chair

Josh Kvidt

Dan LoFaro

Shelly Sorem

Ralph Fisher, Ex-officio

**Competitive Grants**

Jean McKinney, Chair  
(through Sept 30)

Mike Hessel, Chair (from Oct 1)

Arnold Appleby (through Dec 6)

Bob Bailey

David Beck

Barabara Bond

Stella Coakley

Ron Hathaway

Josh Kvidt

Elizabeth Levi

Lance Lyon

Bryan Ostlund

Ed Stastny

Ralph Fisher, Ex-officio

**Executive**

Ralph Fisher, Chair

Chelle Davis (from Nov 2)

Ron Hathaway

Josh Kvidt (through Nov 1)

Elizabeth Levi

Lance Lyon

Bud Weiser

**Finance**

Ron Hathaway, Chair

Chelle Davis (from Nov 2)

Josh Kvidt (through Nov 1)

Dan LoFaro

Mike Macnab

Pat Malone

Brenda Powell

Ralph Fisher, Ex-officio

**Nominations**

Bud Weiser, Chair

Stella Coakley

Jean McKinney (from Oct 1)

Ralph Fisher

**Personnel**

Lance Lyon, Chair

Chelle Davis (from Nov 2)

Ralph Fisher

Ron Hathaway

Josh Kvidt (through Nov 1)

Elizabeth Levi

Bud Weiser

**Honorary Directors**

Dan Arp, Dean (through Aug 31)

Alan Sams, Dean (from Oct 31)

Bill Boggess, Exec. Assoc. Dean  
College of Agricultural Sciences

Ed Ray, President  
Oregon State University

**Emeritus Directors**

Roy Arnold

Lane Borg

Ron Cameron

Ellen Egan

Larry Kaseberg

Ken Messerle

Sam Wade

**Foundation Staff**

Russ Karow  
Executive Director

Meredith Wade  
Manager of Finance & Research

Charlene Wilkinson  
Office Manager

The Agricultural Research Foundation

The Agricultural Research Foundation was established in October of 1934 to encourage and facilitate research in all branches of agriculture and related fields for the benefit of Oregon’s agricultural and natural resource industries. The Foundation is the custodian of privately and publicly donated research funds as well as grant funds from commodity commissions and other producer associations. These funds support work conducted in Oregon State University (OSU) facilities in the Corvallis area and throughout the state as well as some cooperative projects with university scientists in other states and around the world.

During the 85 years since its inception, the Foundation has provided leadership, incentive, and support for vigorous research programs across OSU agricultural and natural resource sciences. To date, the Foundation has received and managed over \$210.2 million in donor gifts and grants to support research on a wide range of topics. In addition, the Foundation itself has provided over \$8.5 million of its own funds, via its Competitive Grants Program, to initiate innovative research studies proposed by agricultural and natural resource scientists at OSU.

The founders of the Foundation envisioned a strong, collaborative partnership between OSU and Oregon’s diverse agricultural and natural resource industries. The Foundation has achieved that goal and works toward enhancements each year.



## ARF Honor Roll

### In Memory of Arnold P. Appleby (1935 – 2018)

Arnold Appleby became a member of the Agricultural Research Foundation Board (ARF) in 1995. While he never served as a board officer, nor saw such a role as appropriate for an Oregon State University (OSU) retiree, he played two major roles throughout his time with ARF – he served as a champion for the Competitive Grants Program and as an ARF historian.

Arnold became chair of the “Projects Committee,” now Competitive Grants, when he joined ARF and stayed in that role through 2012 - 17 years. He remained on the committee and was reviewing 2019-21 proposals in the days prior to his death. Arnold guided the committee through development and refinement of its scoring system, the process of allocating special grants in celebration of ARF’s 75th anniversary, and in on-going assessments of the success of the program.

Arnold was a self-proclaimed historian for ARF. He picked up the ARF history mantle from two other people, Richard Floyd and Wilson Foote. They wrote the history of the Foundation from its inception in 1934 through 1984. Arnold added information through 2012. It is his expectation that someone else will pick up the role after him.



Arnold was a “fixture” at OSU and in his profession. While he retired in 1992 after nearly thirty years of work at OSU, he continued to contribute to the OSU Department of Crop and Soil Science and to his profession until his death. He held leadership positions in the Weed Science Society of America and Western Society of Weed Science. He was elected as a fellow in the Weed Science Society as well as the American Society of Agronomy and Crop Science Society of America. Above all else, he was dedicated to teaching and supporting new generations of weed scientists. He estimated that he taught over 2000 students in his introductory weed control and herbicide science course at OSU. He directed 44 MS programs and 30 PhD programs for students from around the world. He was named Teacher of the Year in Crop Science three times, received the R.M. Wade Award as Outstanding Teacher in the College of Agriculture, won three Distinguished Professor awards, and won several Distinguished Service awards from commodity groups and other organizations.



Arnold and his wife Gerry were also service champions. Gerry spent her life helping children, giving them a helping hand early in life. Arnold helped young scientists around the world start their professional careers and supported experienced colleagues who had innovative ideas. One of the ways in which Arnold planned to have a permanent impact on his profession was through establishment of the Arnold Appleby Weed Science Education Fund. This fund was created at the time of his retirement. It provides support of all types for graduate student training in weed science at OSU. If you are interested in contributing to this fund, contact the OSU Foundation – 1-800-354-7281; <https://www.osufoundation.org/s/359/foundation/index.aspx?sid=359&gid=34&pgid=4310>

Arnold’s death is a loss for ARF, OSU and the weed science world. He is gone, but certainly not forgotten.

# 2018-19 Agricultural Research Foundation Financial Summary

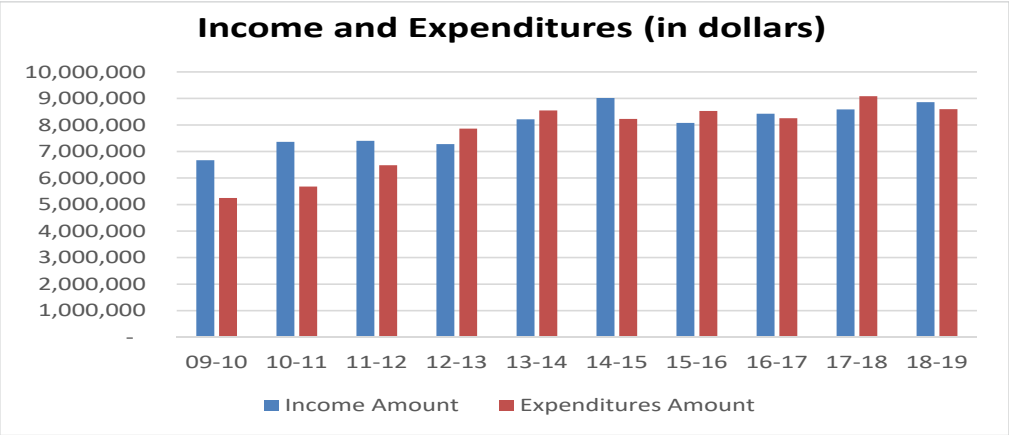
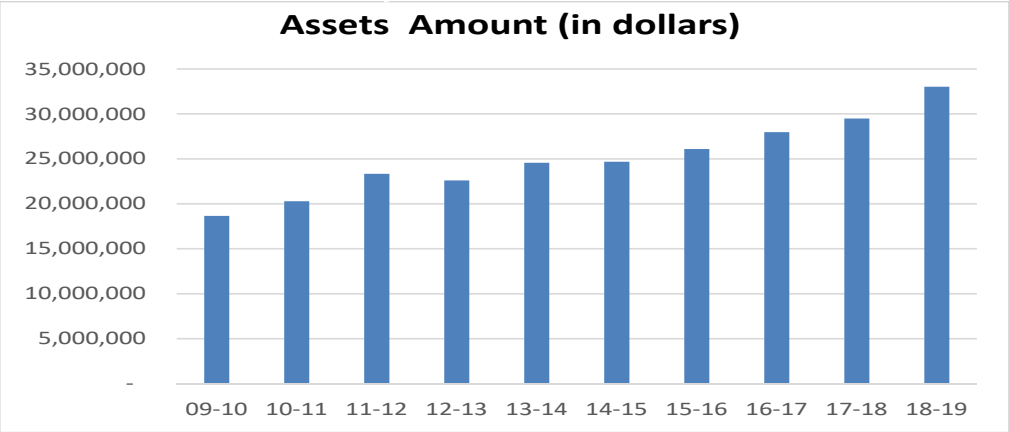
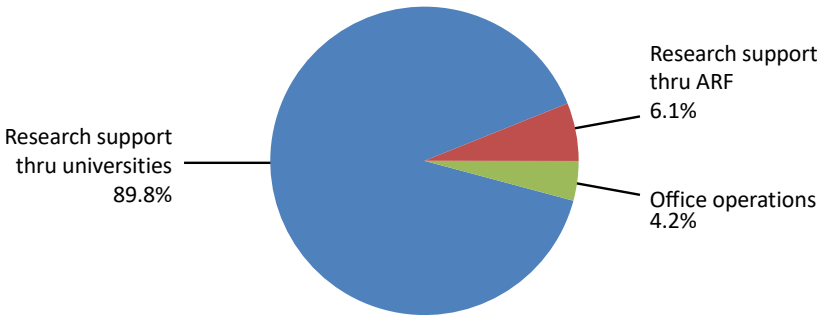
The Agricultural Research Foundation is in good financial health with stable cash flow, strong investment results, and continued revenue growth. Project revenue increased 3% from the previous year to \$8,858,765. Project expenses decreased 5% to \$8,596,593. Total assets increased by \$3.5M to \$33,029,123 and total liabilities increased by \$1.8M to \$16,327,456. The Foundation's general fund provided support for the Competitive Grants Program in the amount of \$568,415, including \$12,000 in support of undergraduate student research. General fund support for other special projects totaled

\$31,450 - College of Agricultural Sciences (CAS) faculty and staff awards, financial support of the CAS Diamond Pioneer recognition program, and support of Oregon's Agricultural Progress Magazine. In addition, the Foundation continues to have clean annual audits and keep operating expenses low. The Foundation generates it's operational and special programs support funds through investments. To balance risk and return in recent years, the Foundation's investment policy has allowed investment in dividend paying equities up to 25% of assets (20% goal with 5% allowed flexibility to account for

trade timing differences). The net rate of return on investment was 7.61%, more than double the rate of the previous year. At the June 30 year end, our investment portfolio had an unrealized gain of \$1,737,894, reflected in net assets as market value above the cost of investments. The financial statements and related financial information in this Annual Report are the responsibility of the Foundation management and have been audited by Jones & Roth, P.C. independent public accountants. **Meredith Wade**  
Manager of Finance and Research



# 2018-19 Agricultural Research Foundation Financial Charts



Income (All funds contributed for research projects excluding general fund investment income)  
Expenditures (All funds spent for research projects excluding office operations)

**AGRICULTURAL RESEARCH FOUNDATION**  
**AUDITED STATEMENTS OF FINANCIAL POSITION\***  
**YEAR ENDING JUNE 30, 2019 – ACCRUAL BASIS**

**2019 ASSETS**

**CURRENT ASSETS**

Cash and cash equivalents	\$ 1,988,272
Short-term investments	6,519,296
Contracts receivable	3,380,882
Short-term contribution receivable	100,000
Investment earnings receivable	272,056
Advance research payments	226,037
Total current assets	<b>12,486,543</b>

**NONCURRENT ASSETS**

Equipment and leasehold improvements, net	11,151
Other long-term investments	19,393,340
Restricted endowment investments	1,138,089
Total noncurrent assets	20,542,580

<b>TOTAL ASSETS</b>	<b>\$ 33,029,123</b>
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**LIABILITIES AND NET ASSETS**

**CURRENT LIABILITIES**

Accounts payable, trade	\$ 15,376
Accounts payable to Oregon State University	228,620
Contracts payable to Oregon State University	4,975,490
Accrued compensation absences	15,183
Unearned contract revenue	11,090,215
Capital lease liability	2,572
Total liabilities	<b>16,327,456</b>

**NET ASSETS**

Net assets without donor restrictions	5,608,595**
Net assets with donor restrictions	11,093,072
Total net assets	<b>16,701,667</b>

<b>TOTAL LIABILITIES AND NET ASSETS</b>	<b>\$ 33,029,123</b>
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\* The financial statements of ARF as of and for the year ended June 30, 2019 were audited by Jones and Roth, P.C. and their report dated September 25, 2019 expressed an unmodified opinion on those statements. A copy of the full audit report is available from the ARF office.

\*\* Net assets unrestricted and undesignated totaled \$2,377,118 at the end of FY19. These funds are fully at ARF Board spending discretion. This total was \$2,160,988 for FY18.

**AGRICULTURAL RESEARCH FOUNDATION**  
**AUDITED STATEMENTS OF ACTIVITIES**  
**YEAR ENDING JUNE 30, 2019 – ACCRUAL BASIS**

**2019**

Without Donor Restrictions	With Donor Restrictions	Total
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**REVENUES, GAINS, AND OTHER SUPPORT**

Contract income	\$ 6,136,819	\$ -	\$ 6,136,819
Contributions	833	2,721,113	2,721,946
Investment earnings	870,601	46,801	917,402
Realized gain on investments	139,557	5,729	145,286
Net assets released from restrictions - fulfillment of purpose	2,305,317	(2,305,317)	-
Total revenues, gains, and other support	<b>9,453,127</b>	<b>468,326</b>	<b>9,921,453</b>

**EXPENSES**

Program services:			
Research expenditures paid through Oregon State University	7,852,573	-	7,852,573
Research expenditures paid through the Foundation	546,447	-	546,447
Research expenditures paid through other universities	197,573	-	197,573
Supporting services:			
Management and general	372,555	-	372,555
Total operating expenses	<b>8,969,148</b>	-	<b>8,969,148</b>

**Changes in net assets before unrealized gain (loss) on investments**

Unrealized gain (loss) on investments	483,979	468,326	952,305
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**Change in net assets**

Net assets, beginning of year	805,090	-	805,090
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Net assets, end of year	1,289,069	468,326	1,757,395
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Net assets, beginning of year	4,319,526	10,624,746	14,944,272
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Net assets, end of year	<b>\$ 5,608,595</b>	<b>\$ 11,093,072</b>	<b>\$ 16,701,667</b>
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# ARF Competitive Grants Program Impacts – Diet and Immune System Interactions in Dairy Animals

Dr. Massimo Bionaz is an associate professor in the Oregon State University Department of Animal and Rangeland Sciences. Dr. Bionaz has received three ARF Competitive Grants over the last six years, all with a focus on exploring interactions between diet and the immune system in dairy animals – goats and cows.

2014-16 – Acquisition of immune-resistance to urushiol through daily consumption of milk from goats fed poison oak

2017-19 – Effect of selenium-enriched hay fed to dairy cows during the dry period on the immunity of calves

2019-21 – Control of oxidative stress through gene-diet interactions in dairy cows

Full reports on the first two projects can be found at this ARF grant website - <http://agresearchfoundation.oregonstate.edu/past-projects>. The third is a new project for which work is currently underway.

The dairy industry is a major component of Oregon agriculture. Milk has ranked among the top five commodities in the state for many years. In 2017, the last year for which data are currently available, milk had a farm gate value of over \$500 million dollars. Oregon has become a leader

in the nation in organic and grass-fed dairy products. Over 20% of the state's dairy operations are organic. There is growing interest among Oregon's milk producers to learn more about ways in which they can affect animal performance through a better understanding of how the plants in an animal's diet can interact with their immune system. Dr. Bionaz explores this newer area of animal science in his research.

Findings of work to date include the following:

- You may have noticed that goat milk products and meat are becoming more available and popular. Goats are able to eat a much broader range of plant materials than other livestock. They can eat poison oak, wild blackberries and other invasive weeds. They are being used for vegetation management in environmentally sensitive areas across the state. But what is the effect of eating a plant like poison oak on a goat and its offspring? Dr. Bionaz and his group discovered that poison oak consumption did not affect milk yield, total solids in milk, milk energy content, or overall feed intake of goats or their kids. Kid body weight was not affected. But body mass of the does (mother goats)



did decline. There was an increase in the content of specific, very short RNA in milk from goats fed poison oak. Analysis of this RNA suggested potential impact on immune system functions related to inflammation. Research continues on these effects.

- Selenium is a mineral like iron or magnesium. Animals can obtain selenium through the food they eat or supplements. Selenium has a positive effect on the immune system of animals, humans included. Calves just after birth have fragile immune systems that make them sensitive to diseases in their first month of life. Selenium fed to cows can be transferred to their calves via placental transfer and milk colostrum. Data from Dr.

Bionaz's lab showed that feeding selenium-fortified hay to pregnant cows improved the selenium level in blood plasma of calves as well as antioxidant activity and the beneficial capability of white blood cells in early post-birth.

- Shortly after giving birth, cows often experience a negative energy balance due to insufficient energy intake. This in turn results in oxidative stress in the cow that can impact milk production, disease resistance, and fertility with resultant economic losses for dairy producers. Increasing the level of antioxidants in a cows system is one of the solutions to dealing with oxidative stress. A cow's antioxidant system can be "turned on" by a specific protein

called Nrf2. Nrf2 production can be enhanced by compounds such as vitamin E, polyphenols, alkaloids found in certain forages. Dr. Bionaz has work underway to determine if adding chicory, plantain, or birdfoot trefoil to a forage mix can affect the health of pasture-fed cows.

Dairy is a major and growing sector of Oregon's agriculture. Dr. Bionaz is directly involved with producers in dairy production systems trying to find innovative ways to improve animal health through manipulation of diet and understanding the impact of diet on the immune system of dairy animals. ARF Competitive Grant funding has played a role in helping to explore these innovations.



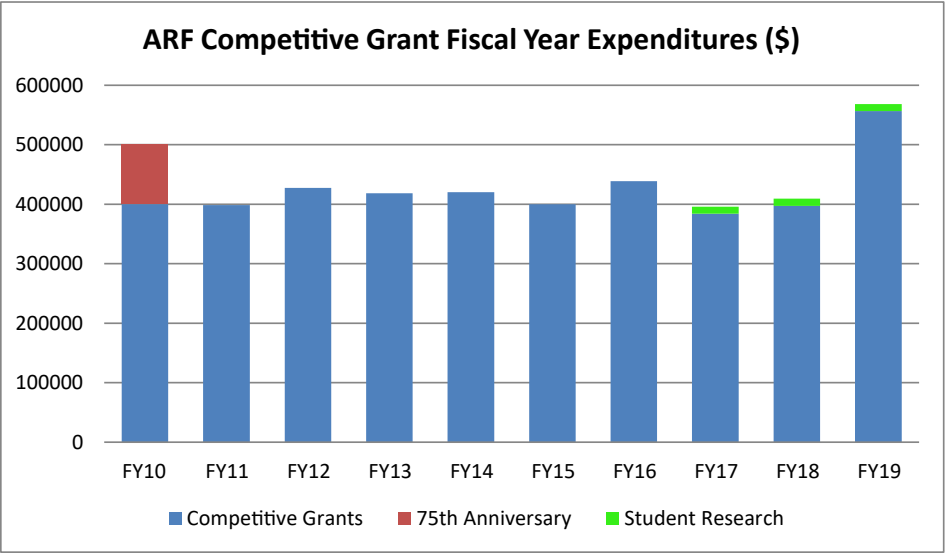
# Competitive Grants Program

The Competitive Grants Program of the Agricultural Research Foundation is designed to encourage and fund research studies at OSU that will enhance Oregon’s agricultural productivity, the quality of its produce and products, and wise management and use of its natural resources – air, water, forest, fisheries, and wildlife. Our goal is to make small catalytic grants that help young scientists launch their research and help established scientists embark on new research directions or approaches. Grants for the 2019-21 period funded in fiscal year 2018-19 ranged from \$10,724 to \$12,500 (the grant maximum). The average amount of the 45 grants given was \$12,365. Grant total was \$556,415. Eighty-two proposals were submitted for 2019-21 funding.

The funds available to support the Competitive Grants Program are discretionary funds generated by the Foundation’s investments. The level of funding available for the program is determined each year by the Board of Directors. Funding the Competitive Grants Program at the highest level possible is a Board priority. Following an assessment of general fund reserve levels during the 2018-19 fiscal year, the Board decided to add an additional ~\$100,000 to the initially approved funding pool, hence the over \$550,000 total. The Board has also decided to increase the proposal maximum value to \$15,000 for the 2020-22 funding period. This grant maximum was last changed in 2007. Board members realize that operational costs have significantly increased over the past decade.

In 2016-17 the Directors decided to provide \$12,000 in competitive grant funding to undergraduate research in the College of Agricultural Sciences (CAS). Funding at this level was continued in 2018-19. In this program, undergraduate researchers are paired with a faculty partner to do a specific research project. The ARF Executive Director works with the CAS Experiential Learning Program coordinator to manage this program.

A history of this Competitive Grants program can be found at [https://agresearchfoundation.oregonstate.edu/sites/agresearchfoundation.oregonstate.edu/files/arf\\_comp\\_grants\\_history\\_03-26-19.pdf](https://agresearchfoundation.oregonstate.edu/sites/agresearchfoundation.oregonstate.edu/files/arf_comp_grants_history_03-26-19.pdf)



# Competitive Grant Awards 2019-2021

Researcher	Unit	Proposal Title
Anderson, Nicole	Crop & Soil Science - Yamhill Co.	Effects of spring mowing on seed yield and biomass of fine fescue seed crops
Arispe, Sergio	Animal & Rangeland Sciences - Malheur Co.	Creating a Software Package to Launch Cattle Behavior Research
Barroso, Judit	Crop & Soil Science - Columbia Basin Ag Research Center	Weed control with real-time precision spraying systems.
Bionaz, Massimo	Animal & Rangeland Sciences	Control of Oxidative Stress through Gene-Diet Interaction in Oregon Dairy Cows
Brunharo, Caio	Crop & Soil Science	Detecting Herbicide Drift Using a Multispectral Camera Enabled Drone to Quantify Spectral Reflectance Changes Based on Herbicide Concentrations
Buckland, Kristine	Horticulture - North Willamette Research & Extension Center	Foliar Leaf Disease Detection with Multispectral Imaging
Buckland, Kristine	Horticulture - North Willamette Research & Extension Center	Innovative Powdery Mildew Control in Tomatoes
Curtin, Chris	Food Science & Technology	Evaluating the potential for dry-hopping to introduce unwanted microbes into beer
Curtin, Chris	Food Science & Technology	Does whole-bunch fermentation increase the risk of Pinot Noir wine spoilage?
DeBano, Sandra	Fisheries & Wildlife - Hermiston Ag Research & Extension Center	Investigating the phenology of early season native bees and shrubs to enhance blueberry and fruit tree production in eastern Oregon
Dung, Jeremiah	Botany & Plant Pathology - Central OR Ag Research& Extension Center	Can Honey Bees Serve as Vectors of Bacterial Blight in Carrot Seed Crops of Central Oregon?
Fernandez-Salvador, Javier	Crop & Soil Science - Marion Co.	Exploring Vertical, Soilless Systems for Increased Efficiency in Oregon Strawberry Production
Hagerty, Christina	Botany & Plant Pathology - Columbia Basin Ag Research Center	Limiting yield loss and grower risk with hyperspectral camera technology for early season virus detection in wheat fields.
Harper, Stacey	Environmental & Molecular Toxicology	Nanoscale delivery of pesticides to replace soil fumigation
Heppell, Scott	Fisheries & Wildlife	Stereo Systems Sustaining Species: Modern video technology to support conservation and management of natural resources
Hooven, Louisa	Horticulture	Novel Delivery Method for Crop Protection Agents and Insecticidal Proteins
Jones, Gerrad	Biological & Ecological Engineering	Mitigating antibiotics and antibiotic resistance in agricultural soils following wastewater and biosolids application
Jones, Gerrad	Biological & Ecological Engineering	Developing Chemical-Forensic Tools for Tracking Nitrate Sources of Pollution Across Agricultural Landscapes
Lajtha, Kate	Crop & Soil Science	Introduced earthworms in Oregon: an investigation into the impacts on soil organic matter in agroecosystems
LeBoldus, Jared	Botany & Plant Pathology	Population genomics of Leptographium wagenieri: The importance of local versus long-distance dispersal in black stain root disease epidemiology
Levi, Taal	Fisheries & Wildlife	Toward statewide molecular monitoring of pollinators in Oregon

Lukas, Scott	Horticulture - Hermiston Ag Research & Extension Center	Field evaluation of fruit maturity and yield with new watermelon grafting methods to reduce verticillium wilt
Lutcher, Larry	Crop & Soil Science - Morrow Co.	Recommendations for Micronutrient Section of Oregon State University Dryland Fertilizer Guides
Mc Donnell, Rory	Crop & Soil Science	Host preference of the pest slug Deroceras reticulatum among key pasture grasses, legumes and herbs
Moore, Amber	Crop & Soil Science	Reevaluating the SMP buffer pH test for lime recommendations in the Pacific Northwest
Moretti, Marcelo	Horticulture	Using Nuclear Magnetic Resonance to Investigate the Mechanisms of Glufosinate Resistance in Italian Ryegrass from Willamette Valley
Navab-Daneshmand, Tala	School of Chemical, Biological, and Environmental Engineering	Stormwater treatment using biochar infiltration columns to reduce antibiotic-resistant bacteria in agriculture irrigation
Ocamb, Cindy	Botany & Plant Pathology	The Role of Seedborne Fusarium in Wheat Root, Crown, and Foot Rot
Peachey, Ed	Horticulture	It's a SNAP: Screening for Herbicide Tolerance to Improve Weed Management in Snap Bean
Penner, Mike	Food Science & Technology	Byproduct-derived high-fiber ingredients for use in formulated foods
Qin, Ruijun	Crop & Soil Science - Hermiston Ag Research & Extension Center	Nitrogen and PGR Application for Seed Yield and Seed Quality in Columbia Basin of Oregon
Qin, Ruijun	Crop & Soil Science - Hermiston Ag Research & Extension Center	Evaluating Imagery Analysis on Nitrogen fertilization for Potato Fields
Rockey, Dan	Biomedical Sciences - College of Vet Medicine	Variable antigen production in Chlamydia abortus from Oregon sheep
Schubiger, Carla	Biomedical Sciences - College of Vet Medicine	Influences of selected herbal supplements and probiotics on innate immunity of marine sablefish in Oregon
Sullivan, Clare	Crop & Soil Science - Deschutes Co.	Which cover crop varieties can improve soil quality in Central Oregon?
Tanner, Christy	Crop & Soil Science - Malheur Co.	Controlling Yellow nutsedge with Cover Crop Competition
Taylor, Anne	Crop & Soil Science	The impact of dairy manure digestate on microbial carbon cycling in soil
Taylor, Anne	Crop & Soil Science	Response of soil N mineralization to temperature
Thompson, Ashley	Horticulture - Wasco Co.	Managing Cork Spot in ‘d’Anjou’ Pears in Oregon through Foliar Applications of Calcium Chloride and Commonly Recommended Complexed Calcium Alternatives
Torres, Leigh	Fisheries and Wildlife - Marine Mammal Institute	Kick-starting COZI – the Coastal Oregon Zooplankton Investigation – to understand microplastic and energetic loads at the base of our food web
Verhoeven, Betsy	Crop & Soil Science - Marion Co.	How does continual straw removal affect biological, chemical and physical indices of soil health?
Wang, Guojie	Crop & Soil Science - Union Co.	Developing a Fall-winter Grazing System by Using Fodder Beets
Wang, Guojie	Crop & Soil Science - Union Co.	Cover Crops after Forage Spring Triticale in Eastern Oregon: Extending Grazing Season in Late Fall under Limited Irrigation Water Situation
Wiman, Nik	Horticulture - North Willamette Research & Extension Center	Exploiting vibrational communication of brown marmorated stink bug for detection and management
Wooster, David	Fisheries & Wildlife - Hermiston Ag Research & Extension Center	Enhancing the Efficacy of Molecular Approaches to Agricultural and Natural Resource Issues in Eastern Oregon by Developing a Regionally Targeted DNA Sequence Library

## Contributors 2018 - 2019

10 Barrel Brewing, LLC  
 A Different Chick Farm  
 A to Z Wineworks, LLC  
 ACMPC Oregon 3, LLC  
 Adame-Winningham, Charles & Nikki  
 Agpro Marketing & Manufacturing, Inc.  
 Alan Mckee Farms  
 Alban, Marie  
 Albaugh, LLC  
 All West Select Sires  
 Alley, Michael & Margueritte  
 Al’s Garden Centers & Greenhouses, LLC  
 Amaranthus Family Charitable Foundation  
 Amebagone, Inc.  
 American Rhododendron Society  
 American Vineyard Foundation  
 AMVAC Chemical Corporation  
 Anheuser Busch Company  
 Aqua-Terra Consultants  
 Aquatrols Corporation of America  
 Art Mattson Dist. Company, Inc.  
 Babb, Yvonne  
 Bailey, Bob & Barbara  
 Bakalinsky, Alan  
 Baker, Gail  
 Bales, Patrick  
 Ball Horticultural Company  
 Ballinger, Court  
 BAMBU, LLC  
 Bandon Dunes, LP  
 Barenbrug  
 Barrick, Maryln

Barsotti, Regina  
 Barth-Haas Group  
 BASF Corporation  
 Battaile, Constance  
 Baumann, Carol  
 Bayer CropScience, LP  
 Beck Pack Systems, Inc.  
 Becker, Mark  
 Becking, John  
 Bee Site, LLC  
 Beekeepers Assoc. - California State  
 Beekeepers Assoc. - Central Coast  
 Beekeepers Assoc. - Central Oregon  
 Beekeepers Assoc. - Columbia Gorge  
 Beekeepers Assoc. - Lane County  
 Beekeepers Assoc. - Linn-Benton County  
 Beekeepers Assoc. - Sacramento Area  
 Beekeepers Assoc. - Southern Oregon  
 Beekeepers Assoc. - State of Oregon  
 Beekeepers Assoc. - Tualatin Valley  
 Bejo Seeds, Inc.  
 Bell, Craig  
 Benjamin, Judith  
 Berger International, LLC  
 Betty E Bahn Trust  
 Beyer, Gene  
 Bierly, Kenneth & Linda  
 Bio Huma Netics, Inc.  
 BioMedix  
 Biorem, Inc.  
 Birkemeier Nursery, LLC  
 Blackburn, Lisa  
 Blue Mountain Community College  
 BlueBird Hill Cellars  
 Bluhm, James

Bluhm, Wilbur  
 Borden, Cheryl  
 Bornstein Seafoods  
 Bosvert, Jennifer  
 Boyer, Lynda & Clifford  
 Bradford, Jason & Kristin  
 Braemar Charitable Trust  
 Brandt Consolidated, Inc.  
 Brassica Foundation  
 Brewers Association, Inc.  
 Brewing & Distilling Analytical Services, LLC



Brinson, Martha  
Broderick, Tammy  
Brooks, Woody  
Broshot, Nancy  
Brown, Dennis  
Bryan Jr., Richard  
Buck & Ann Fisheries, LLC  
Burdock, Garland  
Burnham, Robin & Richard  
Butler, Glenna Kay  
California Pear Advisory Board  
California Table Grape Commission  
California Walnut Commission  
Camas Prairie Angus Ranch  
Cambridge University Press  
Cardona, Oscar  
Carex Working Group  
Carl Bonfert  
Carr, Gerald & Barbara  
Carrigan, Rodney  
Carrington, P.J.  
Carroll, George & Fanny  
Cascade Foods, Inc.  
Cascade Mycological Society  
Central Oregon Health Council  
Certis USA, LLC  
Chambers, Kenton  
Chan, Samuel  
Chapman, Nancy  
Chester M. Wilcox Memorial Trust  
Chevis, Cheryl  
Chicken Legs Imperfections  
Chipotle  
Christmas Tree Promotion Board  
CHS Primeland  
Clackamas County Farm Bureau  
Clackamas Soil and Water  
Conservation District  
Clark, Jason

Clatsop Community Bank  
Clean Water Services  
CLIF Bar & Company  
Coakley, Stella & James  
Coe, Kent & Pricilla  
Cole, Sheryl  
Coleman Agriculture, Inc.  
Collins Agricultural Consultants, Inc.  
Columbia Basin Grass Seed  
Association, Inc.  
Columbia Basin Onion Research  
Committee  
Columbia Gorge Fruit Growers  
Columbia Pulp, LLC  
Columbia River Inter-Tribal Fish  
Commission

Columbia Seeds  
Combs, Barbara  
Community Bank  
Confederated Tribes of Siletz Indians  
Coolidge III, Arthur  
Cornell University  
Cottage Grove Garden Club  
Crow About Orchards  
Crystal Creek Organics  
Currier Farms  
D & B Supply  
Da Yang Seafood, Inc.  
Daley, Theresa  
Dallas, David  
Dally, Elisabeth  
Dan Sebesta Trust

Dancing Oaks Nursery, Inc.  
Darwin’s Natural Pet Products  
David, Bernard  
deQuay, David  
DeWilde & Basinger, Inc.  
Dewitt, Christina  
Dillon, Cynthia  
DLF Pickseed  
Dobak, David  
Dole Refrigerating Company  
Donham, Kathleen  
Dorow, Janet  
Dow AgroSciences, LLC  
Dow International Finance  
Dryden, Linda  
DSM Biotechnology Center  
DSM Finance B.V.  
Duerksen & Associates, Inc.  
DulsEnergy  
Dune Sciences, Inc.  
DuToit, Chaz & Sabine  
E & J Gallo Winery  
E I Dupont DE Nemours & Company  
Eastman  
Echo Electuary  
Edwards, Lynn  
Edwards, Scott  
Eichier Farms  
Ellis, Greg  
Ellis, Margaret  
Elysian Fields Public Relations  
Engage Agro  
Englund Marine & Industrial Supply  
Enza Zaden USA, Inc.  
Epidendio, Barbara  
Erath Family Foundation  
Ernst Irrigation  
Escarpment Laboratories  
Eugene National Taphouse



Experimental Farm Network  
Expert Fish Pathology, LLC  
F A Bartlett Tree Expert Company  
Farm Equipment Headquarters, Inc.  
Feil Orchards, Inc.  
Fernandez-Salvador, Javier  
Ferriel, Roger  
Fifield, Phyllis  
Fine Americas, Inc.  
First Fruits Foundation  
First Interstate Bank  
Fischer, Robert & Carol  
Fisher, Elizabeth  
Flora USA, Inc.  
Flottweg Separation Technology  
FMC Corporation  
Fragoso, Christopher

Franklin, Jerry  
Friedman, Sam  
Frojen, Robin  
GardenTrends  
Gelco Supply, Inc.  
Geschwill, William & Heidi  
Gilmore, Clare & Paul  
Giustina Land & Timber Co.  
Giustina, Sylvia  
Glenn, Theo  
Glynwood Center  
GMFI  
Goddik, Lisbeth & Patrick Meunier  
Golden Valley Warehouses, Inc.  
Goose Point Oysters, Inc.  
Gopinath, Varun  
Gottlieb, Vera



Goulder Family Foundation  
Gowan Company, LLC  
Grain Craft  
Grain Millers, Inc.  
Grassland Oregon  
Gray Farms, Inc.  
Greenwood Resources, Inc.  
GS Long Co., Inc.  
Gudger, Deborah  
Gustafson Logging Company  
Halls Ferry Farms  
Halsey, Kimberly  
Haluzak, Sarah  
Hampton Lumber Mills, Inc.  
Handley, Jeffrey  
Hanes, Sharon & Richard  
Hansen, Everett  
Happy Valley Garden Club  
Hartley, Sandra  
Hartline, Jane

Harvey, Tanya  
Hawaiian Shellfish, LLC  
Hayes, Patrick  
Hays, Phillip  
Heller, Lynne & Donald  
High Mowing Organic Seeds  
Himes, Kenneth  
Hoffart Augeri, Megan  
Hoffmann, James & Grace  
Hog Island Oyster Company, Inc.  
Holmes, Kevin  
Holmgren, Noel & Patricia  
Holte, Karl & Ardys  
Hop Quality Group  
Hop Research Council  
Howard, Barry  
Hudson Valley Seed Company  
Humbug Farms  
Hummingbird Wholesale  
Idaho Bean Commission

Idaho Eastern Oregon Onion  
Committee  
Idaho Wheat Commission  
InBev Baillet Latour  
Independent Brewers Association  
Indie Hops, LLC  
IOKA Marketing, LLC  
ISK Biosciences Corporation  
J Frank Schmidt Family Foundation  
Jackass Mountain Ranch  
Jackman Foundation  
Janeway, Lawrence  
Jaster, Anne  
JDZ, Inc.  
Jeddeloh, Jan  
Jefferson County Smoke Management  
Program  
Jefferson, Jafar  
Jernstedt, Kathryn  
Jet Harvest Solutions  
John I Hass, Inc.  
Johnny's Selected Seeds  
Johnson, Morris & Margaret  
Joiner, John & Karen  
JoVE  
JRT Nurseries (US)  
Kaye, Thomas  
Keasbey, Doramay  
Kern, Deborah  
Kerr, Tami & Bryan  
Kestner, Patricia & Robert  
Kiefel, Taylor  
Klemp, Stephen  
Kochsmeier, Karol  
Koenig, John  
KOI Organisation International, Inc.  
Kombucha Brewers International  
Korean American Scientists &  
Engineers Assoc.

Korfhage, Robert  
Kronenberg, James  
L&C Tree Farm, LLC  
Land O'Lakes, Inc.  
Larsen, Lynn  
Lauer, Donald  
Lehigh Agri & Bio Services, Inc.  
LENA Publications  
Letendre, Glenn  
Lewis & Clark National Park Assoc.  
Life Technologies  
Limagrain Cereal Seeds, LLC  
Lindquist, Mark & Kathleen  
Lindsay, Eliza  
Lipscomb, Barney  
Liston, Aaron & Sara  
Livengood, David  
Lorang, Jennifer  
Love, Glen & Rhoda  
Loveland Products, Inc.  
Luoma, Dan  
MacCarthy, Donald  
Magedanz, Janet  
Maher, David  
Makhteshim-Agan of North America,  
Inc.  
Maletzky, Barry  
Malhuer County Onion Growers  
Assoc.  
Manna NW, LLC  
Marc Adams School of Woodworking  
Marcus, Craig  
Marion Ag Service, Inc.  
Mark, Stephen  
Markham, Craig & Susan Aldrich-  
Markham  
Marquering, Henry & Louise  
Marrone Bio Innovations, Inc.  
Massey, Barbara

Master Gardener Assoc. of Oregon  
Master Gardeners Assoc. - Central  
Oregon  
Master Gardeners Assoc. -  
Multnomah Co.  
Master Gardeners Assoc. - Umatilla  
Co.  
Mauritz, Charles & Sara  
McCaffrey, Cheryl  
McCain Foods USA, Inc.  
McEvoy, Peter & Esther  
McKim, Harriet & Justin Smith  
McMillan, Steve  
McNeil, Deborah  
Meierhenry, Stanley & Margaret  
Melchior, Gary  
Mendius, Barbara  
Metropolitan Garden Club of  
Portland  
Mid Columbia Producers, Inc.  
Miles Breeding Service  
Miller, Marilyn  
Mint Industry Research Council  
Mitchell, Nancy  
Molina, Nancy & Randolph  
Moore, Frank & Jeanne  
Moore, Mary Ann  
Moore, Rich  
Moore, Stanley  
Morrow County Grain Growers  
Mountain View Acres  
Mountainview Seeds  
Mumblo, BA  
Mycological Society of America  
Mynhier, Stephen  
NABG Research Foundation, Inc.  
Nachurs Alpine Solutions  
National Assoc. of Agricultural  
Educators

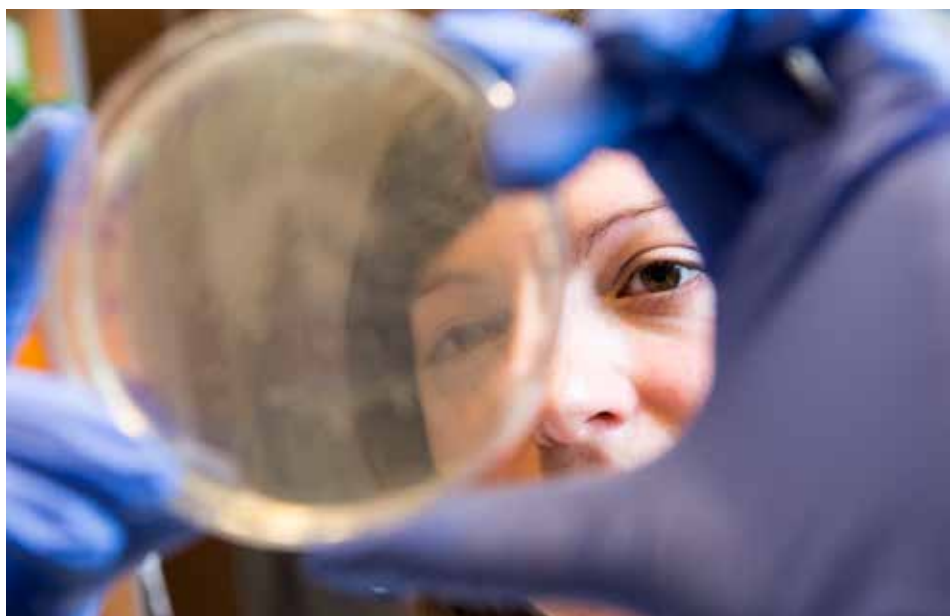


National Pesticide Safety Education  
Center  
National Turfgrass Evaluation  
Program  
National Watermelon Promotion  
Board  
Native Plant Society of Oregon  
Native Plant Society of Oregon -  
Emerald Chapter  
Natter, Jean  
Netafim  
Nevor Shellfish Farm, LLC  
New Zealand Department of  
Conservation  
Newberry, George  
Newhouse, Bruce  
Nichols, Mark and Julie  
Nichols, Rory  
Ninkasi Brewing, LLC

Noah, Creed & Melissa  
North American Truffling Society  
North Carolina State University  
North Willamette Valley Horticulture  
Society  
Northwest Berry Foundation  
Northwest Biosolids  
Northwest Christmas Tree Assoc.  
Northwest Farm Credit Services  
Northwest Grain Growers, Inc.  
Northwest Plant Company  
Northwest Turfgrass Association  
NW Housing Solutions, LLC  
Obrien, John  
O'Donnell, Richard  
Olmix NA, Inc.  
Olson, NR & BB  
OMG Cooperative Corporation  
OmniLytics, Inc.

Oregon Association of Woodturners  
Oregon Beef Council  
Oregon Blueberry Commission  
Oregon Cattlemen's Association  
Oregon Chapter American Fisheries  
Society  
Oregon Clover Commission  
Oregon Community Foundation  
Oregon Dairy Farmers Assoc.  
Oregon Dairy Products Commission  
Oregon Dungeness Crab Commission  
Oregon Food Bank  
Oregon Forest Industries Council  
Oregon Fresh Market Growers  
Assoc.  
Oregon Hay & Forage Assoc.  
Oregon Hazelnut Commission  
Oregon Hop Commission  
Oregon Mint Commission  
Oregon Mycological Society  
Oregon Orchard Grass Seed  
Producers Commission  
Oregon Potato Commission  
Oregon Processed Vegetable  
Commission  
Oregon Ryegrass Growers Seed  
Commission  
Oregon Seed Council  
Oregon Sheep Commission  
Oregon State University  
Oregon Strawberry Commission  
Oregon Sweet Cherry Commission  
Oregon Tall Fescue Commission  
Oregon Tilth, Inc.  
Oregon Trail Livestock Supply, Inc.  
Oregon Trail Seeds Inc.  
Oregon Wheat Commission  
Oregon Wheat Growers League  
Oregon Wine Board

Oregon Wine Brotherhood  
Organic Seed Alliance  
Organic Valley  
Organically Grown Co.  
Origis Devco Holdings, LLC  
Ortiz, Suzanne  
OSU Foundation  
Otting, Nick  
Otto, Patricia  
Ovabrite, Inc.  
Pacific Intermountain Mortgage  
Company  
Pacific Northwest Solar, LLC  
Pacific Northwest Vegetable Assoc.  
Pacific Seafood  
PacificSource  
Parry, Betsy  
Paul, Judith  
Pear Pest Management Research  
Fund  
Pedee Creek Farm, LLC  
Pendleton Sanitary Service, Inc.  
Penhallegon, Ross & Kathryn  
Peoria Gardens, Inc.  
Perennial Designs  
Perez, Melanie Link  
Petro Canada Lubricants, Inc.  
Pfund, Itsue  
PGG/HSC Feed Company, LLC  
Pierce, Allen  
Poinsett, Sandra  
Porath, Marna  
Portland Garden Club  
Portland Urban Beekeepers  
Post, JT & VC  
Potato Variety Management Institute  
Potatoes USA  
Powder River  
Powers, Margaret



Prag, Raymand & Margaret  
Precision Agricultural Research, Inc.  
Premium Growers, LLC  
Price Cattle Co.  
ProGene, LLC  
Progressive Publishing  
Queisser, Susan & Andreas  
Quinn, Charles  
Raptor Ag  
Rasmussen, Kim  
Ream, Walt  
Reed, Matt  
Regan, Andrew  
Republic Services  
Reynolds, Phyllis  
Reynolds, Wes & Susan  
Richland Feed & Seed, Inc.  
Rictor, Tony  
Riggs, Debilyn  
Ripley, James & Arlene Grace

RMZ Labor Contractor  
Roberts, Cassandra  
Rogue Farm Corps  
Rogue Foundation  
Rosenberg, Rita  
Rosenbloom, Norman & Judith  
Ross, Bob  
Ross, Robert A  
Roufs, Renee  
Rowdy Mermaid Kombucha  
Roy, Barbara  
Running, Sara  
Ryburn, Susan  
Rydell, Leonard  
Sakata Seed America, Inc.  
Samuel Adams The Boston Beer  
Company  
Sandahl Orchards, Inc.  
Santos Labor Force  
Saul, Susan

Scharf, Jason & Anna  
Schleuning, Patricia  
Schwartz, Patricia  
Schwindt, Rachel  
Sclawy, Judith & Howard Adelman  
Scofield, Larry Rex & Ruth  
Scoggins, Thomas & Joan Alice  
Scott Laboratories  
Scott, Gwendolyn  
Seabreeze Farms, LLC  
Seevers, Joan  
SePRO Corporation  
Shellhammer, Tom & Gina  
Shen, Charlton & Phoebe  
Sheng, Y. Sherry & Spike Wadsworth  
Sherman Aviation, Inc.  
Sherry, Marcia & Robert  
Shining Ocean, Inc.  
Shultheis, Sandra & David  
Sibell, Xuan & David  
Simplot  
Simpson, Charlene  
Singer, Tiney  
Skretting North America  
Slichter, Paul  
SLR International Corporation  
Smith, Carrie  
Smith, James D  
Smith, Karen  
Snake River Sugarbeet Research  
and Seed Alliance, LLC  
Soil Health Institute  
SOMA  
Sondena, Angela  
Sonoma County Woodworkers  
Associations  
Sorber, James & Lynne  
SP Provisions  
Spatafora, Joseph & Elizabeth

St Charles Health System  
Stanislowski, Laura and Mark  
Stanley Black & Decker  
Starker Forests, Inc.  
Stekel, Peter  
Sterett, Jack & Deanna  
Stone, Daphne Fisher & Jeffrey  
Stritzke, Ed  
Stubb, Kerri Rose  
Stuckey, Rick  
Sturges, James  
Sundberg & Associates, Inc.  
Sundberg, Kent  
Sundberg, Mark  
Sunnyview Red Barn  
Susan E Morton Trust DTD  
Swanson Skinner, Martin & Julie  
Swanson's Pest Management  
Swinomish Tribal Community  
Syngenta Crop Protection, LLC  
T3 Bioscience, LLC  
Tabcomp  
Takasago International Corp (USA)  
Tappon, Ellen  
Tappon, Paul  
Taylor, Joyce  
Tecniplast USA, Inc.  
Territorial Seed Company  
Tessengerlo Kerley, Inc.  
Thermo Fisher Scientific  
Thomas, Andrew  
Throop, Janet  
Toomb, Zackary & Mindianne  
Trappe, James  
Traynor, Patrick & Cindy  
TRECO  
Trident Ag. Products, Inc.  
Trident Products & Services, LLC  
Troop, H Grant

Tualatin Soil & Water Conservation  
District  
Tucker, Shirley  
Turfgrass Water  
Turner Ag Research, Inc.  
Unferth, Julia  
Union County Seed Growers Assoc.  
United Grain Corporation  
United Phosphorus, Inc.  
University of California - Daivs  
University of Idaho  
University of Minnesota  
University of Wisconsin - Madison  
UniversityHero/5thStGrowlers  
Utah State University  
Valent BioSciences  
Van Dyke Seed Co., Inc.  
Van Vechten, George  
Vanasche, David & Ellen  
Vanleeuwen, James  
Various - Other  
Wagner, David  
Waite-Cusic, Joy  
Walker, Jeffrey  
Walters, Kenneth Jay  
Walters, Wally  
Washington Blueberry Commission  
Washington Cattle Feeders Assoc.  
Washington County Master Gardner  
Assoc.  
Washington Hop Commission  
Washington Oilseeds Commission  
Washington Red Raspberry  
Commission  
Washington State Potato  
Commission  
Washington State University  
Washington Tree Fruit Research  
Commission

Washington Turfgrass Seed  
Commission  
Watchable Wildlife Foundation  
Weiser, Conrad (Bud)  
Wennerstrom, Robert  
Werling, Rachel  
West Multnomah Soil & Water  
Conservation District  
Westbridge Agricultural Products  
Westcott, Richard & Kathleen  
Western Laboratories, Inc.  
Western Poultry Scholarship &  
Research Foundation  
Wetlands Conservancy  
Weyerhaeuser  
Where Food Comes From, Inc.  
Whiskey Creek Shellfish Hatchery  
Wiegand, Zachary  
Wilbur-Ellis Company  
Wilco-Winfield, Inc.  
Wilson, Mark  
Wilson, Theresa  
Wine Country Woodturners  
Wingmen V, LLC  
Witters, Robert & Carolyn  
Woman's University  
Woodell, Aaron  
Worthington, Roger  
Wright, Carolyn  
Wtechlink, Inc.  
Yang, Sunia  
Yoerger, Karen  
Yook, Karen  
York Potash Ltd  
Zamudio, Desiderio & Karen  
Zobel, Donald & Priscilla



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- Page 1:** Dairy cows in western Oregon pasture — Massimo Bionaz
- Page 2:** Goat feeding on poison oak feed — Massimo Bionaz
- Page 3:** Field peas in western Oregon — Betsy Verhoeven
- Page 4:** Field tour in eastern Oregon — Christina Hagerty
- Page 5:** (Bottom left) Selenium treated forage sample — Massimo Bionaz  
(Right) Fall cover crop trial — Clare Sullivan

- Page 6-7:** Arnold Appleby & grandson Ben
- Page 8:** Grower surveying fall cover crop trial — Clare Sullivan
- Pg 10-11:** Selenium plots in Union County — Gene Pirelli
- Page 12:** Goat feeding on poison oak feed — Massimo Bionaz
- Page 13:** Luigi Meneghelli, co-owner of Inavale Farm, with Dr. Massimo Bionaz discussing poison oak research — Claudia Ingham

- Page 14:** Calf roping in rodeo competition — Chris Schachtschneider
- Page 17:** Anabel Mendoza collecting blood samples from sablefish — Carla Schubiger

- Page 18:** Forage plot harvest — Gene Pirelli
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- Page 20:** Grad student Emily Dziedzic in Dr. Taal Levi lab — Emily Dzisdzic

- Page 21:** Gray garden slug & eggs — Man-yeon Choi
- Page 22:** Algae samples from Upper Klamath Lake — Kim Halsey
- Page 23:** Dr. Jovana Kovacevic working in her food microbiology lab — Lynn Ketchum
- Page 25:** Asian jumping worms — John McQueen
- Page 26:** Broiler chicken in microalgae feeding trial — Gita Cherian



From the Archives

Ledger pages for the first two projects managed by ARF

10 The Dalles Cooperative Growers, Inc. (Buying cherries and fruit by-products)					11 The Dalles Cooperative Growers, Inc. (Buying cherries and fruit by-products)				
Date	Item	Deb.	Receipts	Balance	Date	Item	Deb.	Receipts	Balance
Nov. 17	The Dalles Cooperative Growers		361.45		Feb. 22	O.S.C. Buena Vista Co. 1st. 1st. (C) 111		50	98.78
15	E. E. Hartman - travel (C) 1	27.65		332.80	28	E. E. Hartman - travel (C) 112		100	97.78
27	E. E. Hartman - travel (C) 2	9.55		323.25	Mar. 5	E. E. Hartman - travel (C) 123		13.70	84.08
Dec. 6	E. H. Wiegand - travel (C) 5	21.99		301.26	5	Arnold Rutger - wages Feb. (C) 125		50.00	34.08
6	The Cooperative Co. - supplies (C) 7	10.00		291.26	April 8	The Dalles Cooperative Growers		250.00	284.08
6	Cornwall B.T. (half 20.45) station (C) 8	15.12		276.14	8	Donald Rutger - wages March (C) 145		50.00	234.08
7	Shell Oil Co. - gas (C) 12	11.47		264.67	8	Donald Rutger - expenses (C) 168		4.30	229.78
10	Holmes Exp. Co. - supplies (C) 13	17.75		246.92	8	E. H. Wiegand - expenses (C) 169		4.20	225.58
10	R.M. Kover - legal services (C) 14	24.20		222.72	27	Donald Rutger - wages (C) 179		15.00	210.58
18	Shell Oil - gas & oil (C) 16	8.45		214.27	28	Kramer Machine Co. (C) 180		5.00	205.58
1925 Jan. 17	E. E. Hartman - travel (C) 18	7.85		206.42	May 1	Arnold Rutger - wages April (C) 192		49.70	156.72
17	Shell Oil - gas & oil (C) 21	2.99		203.43	6	Industrial Wood Co. (C) 201		6.00	150.72
17	Shell Oil - gas & oil (C) 23	2.10		198.69	16	Agricultural Postal Fund (C) 218		12.64	138.08
Mar. 5	Correction - Check #9 (C) 24	50		188.19	22	E. H. Wiegand (C) 226		9.65	128.43
6	Brown Shovel Mining Co. - wages (C) 29	5.84		182.35	22	D. J. Gortner (C) 227		4.30	124.13
April 17	E. E. Hartman - travel (C) 31	50		132.35	22	E. F. Ziegler - O.S.C. Freight Acct. (C) 228		1.00	123.13
May 3	Charles Hartman - travel (C) 40	40.00		92.35	28	Whitely Lumber Co. (C) 236		13.63	109.50
3	E. H. Wiegand - travel (C) 41	20.00		72.35	28	Donald J. Rutger (C) 238		49.69	59.81
July 5	Charles E. Hartman - travel (C) 51	1.50		70.85	June 8	D. J. Gortner (C) 247		9.65	50.16
5	E. H. Wiegand - travel (C) 52	1.88		68.97	8	Parlier Tel. & Tel. (C) 249		2.70	47.46
June 29	Transferred to General Fund no reimbursement statement attached expenditures on the Dalles project (see statement attached general acct.)		116.47	116.47	7	Marjorie L. Sulz (C) 255		4.15	43.31
			361.45	361.45	12	Industrial Accident Com. (C) 266		7.79	35.52
Nov. 9	The Dalles Cooperative Growers		200.00		22	Agri Car Pool Account (C) 267		12.43	23.09
11	Donald Rutger - wages (C) 60	50.00		150.00	22	E. G. Yeamer (C) 272		8.00	15.09
Jan. 4	Donald Rutger - wages (C) 61	50.00		100.00		Error in entering check no. 217 (see correction under Head River Acct.)		1.05	13.94
Feb. 1	Donald Rutger - wages (C) 77	50.00		50.00	27	E. F. Ziegler - O.S.C. Freight Acct. (C) 285		33.80	1.14
4	E. F. Ziegler, O.S.C. Freight - expenses (C) 90	72		19.28	July 23	Photographic Service Acct. (C) 311		1.28	0.86
	Balance carried forward		250.00	150.72			500.00	500.00	—

# From the Archives

Ledger pages for the first two projects managed by ARF

4					
Hood River Apple Growers Assn. (By-products of Apples and Pears)					
Date	Item	Check No.	Receipts	Disbursements	Balance
1934 Oct. 30	Hood River Apple Growers		840.00		
Dec. 5	Myron Powers - wages	(w) 3		31.50	808.50
Dec. 6	E. H. Wiegand - travel	(t) 4		16.75	791.75
	American Copper Works - supplies	(c) 6		38.00	753.75
	Corvallis B.T. (1/2 of Dec. 25) Stationary	(c) 8		15.13	738.62
	Dept. of Bldg. & C. - express	(P) 9		50	738.12
	Shell Oil Co. - gas & oil	(t) 10		7.13	730.99
	Crane Co. - supplies	(c) 11		2.06	728.93
	R. M. Kerr - legal services (1/2 of Dec. 25)	(P) 14		24.20	704.73
	Pac. Tel. & Tel. - telephone	(P) 15		3.25	701.48
	Shell Oil - gas and oil (Dec. 25)	(t) 16		5.05	696.43
1935 Jan. 2	Myron Powers - services	(s) 17		28.00	668.43
	O.A. Business Office - telephone	(P) 19		1.90	666.53
	Findings - supplies	(c) 20		1.50	665.03
	Shell Oil - gas & oil (Dec. 25)	(t) 21		2.10	662.93
	E. H. Wiegand - travel	(t) 22		24.70	638.23
Feb. 25	Myron Powers - services	(s) 24		28.00	610.23
Mar. 5	Corrections - checks #9	-	50		610.73
	Dept. Bldg. & C. - freight	(P) 25		50	610.23
	Freight Packing Co. - supplies	(c) 26		4.11	606.12
	O.A. Widener - supplies	(c) 27		6.50	599.62
	Industrial Arts Service Assn. - supplies	(c) 28		5.09	594.53
	Myron Powers - wages	(w) 30		14.00	580.53
	Water Machine - labor	(w) 32		19.60	560.93
April 1	Dept. of Buildings - freight	(P) 33		70	560.23
4	Myron Powers - wages	(w) 34		14.00	546.23
4	O.A. Business Office - telephone	(P) 35		1.30	544.93
4	Dept. of Bldg. & C. - express	(P) 36		.62	544.31
17	E. J. Fugle, B.C. Freight Assn. - freight	(P) 37		1.00	543.31
17	E. J. Fugle, B.C. Freight Assn. - freight	(P) 38		1.27	542.04
May 3	E. H. Wiegand - travel	(t) 42		23.00	522.04
3	Water Machine - travel	(t) 43		40.00	482.04
3	Myron Powers - wages	(w) 44		28.00	454.04
	Totals Carried forward	-	840.50	386.46	454.04