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A History of Science and Society in Oregon: Oregon State University's Extension and Experiment Station Publications

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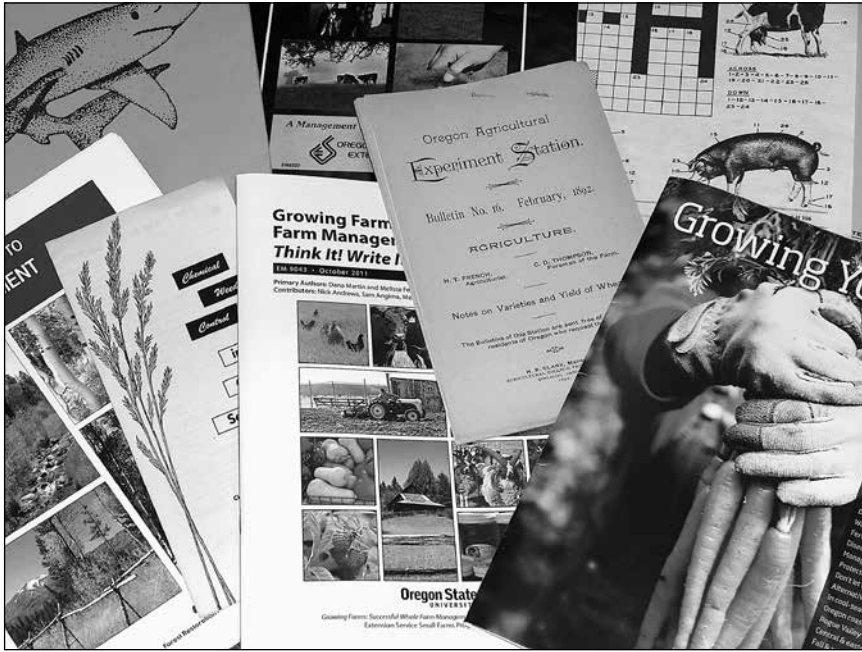
A History of Science and Society in Oregon

Oregon State University's Extension and Experiment Station Publications

by Sue Kunda

IN HIS VERY first campaign statement, twenty-three-year-old Abraham Lincoln professed his belief that education is “the most important subject which we as a people can be engaged in” and proposed that “every man may receive at least, a moderate education.”¹ The young candidate’s lofty ideals eventually helped lay the foundation for the nation’s land-grant university system and its three functions: education, research, and extension. Education and research at a land-grant university are tightly interwoven and are made available to the public through a community-based extension service. For more than one hundred years, land-grant universities such as Oregon State University (OSU) have disseminated research findings to farmers and rural residents. Outreach materials produced by OSU researchers reached Oregon’s agricul-

tural organizations, family farms, and residences on a number of pathways. Citizens received research bulletins through the mail and at farmers’ institutes, demonstration trains carried farming experts and research-related exhibits to the state’s outer confines, and rural residents crowded open events and walked away with informational materials intended to improve their lives. Today, due to the rise of digital technologies and a recent collaboration between OSU’s Extension and Experiment Station Communications (EESC) and OSU Libraries and Press, the outreach and research publications are online and openly available on the Internet. Oregon citizens and the wider global community can access the documents with a few clicks of a mouse. Placing an entire century and a half of OSU’s research and science online and provides access to those



Courtesy of Sue Kunda

A small sample of the more than 8,000 Oregon State University (OSU) Extension and Experiment Station Communications (EESC) publications illustrates the diversity of topics and formats covered by the communications unit. Digital versions of all publications are now openly available at ScholarsArchive@OSU.

materials, full-text search capabilities also allow others to study the materials in entirely new ways. Researchers can document trends and make new connections to inform today's practices, historians can unveil the past to better understand the present, and educators can point their students to the publications as examples of local advances in science and history. Understanding the foundational history of OSU's land-grant mission and exploring a few examples of Oregon's historical and social landscapes, as revealed through the university's outreach materials, offer a glimpse at their significant his-

tory and the wealth of knowledge now easily available to the public.

ON JULY 2, 1862, during the height of the Civil War, President Abraham Lincoln signed the Morrill Act into law.² This unprecedented piece of legislation provided each state with federal land that was then sold to establish public land-grant colleges "in order to promote the liberal and practical education of the industrial classes."³ Prior to the landmark legislation, only sons of the wealthy had access to the nation's higher education, with its curriculum characterized by

classical studies. Scientific discovery played a limited role in the nation's educational and industrial progress. In addition, an uneducated general population distrusted science and largely ignored attempts to apply it to daily lives.⁴ Land-grant colleges offered a radically different vision. Newly founded public institutions helped underwrite tuition costs for students, making college education affordable for more people. Schools broadened liberal arts curricula to include more practical topics such as science, engineering, and agriculture. Agriculture and industry, which until that time used apprenticeships to hone individual skills, benefitted from the more effective pedagogy of the land-grant system.⁵ Research and education melded in programs based on, and informed by, science. Twenty-eight years later, in 1890, a second Morrill Act compelled states with schools where attendance was restricted to whites only to either allow black students entrance or provide for them separate but equal facilities.⁶

In 1887, the Hatch Act further expanded the Morrill Acts by providing funding at each land-grant institution for Agricultural Experiment Stations, where scientists and researchers would test agricultural practices and conduct agriculture-related research to help farmers increase crop and livestock productivity.⁷ Early information dissemination practices, however, proved unsuccessful. Scientific and research results distributed through bulletins were too technical for most

farmers, and the publications largely went unread.⁸ The Smith-Lever Act of 1914 attempted to alleviate the disconnect between researchers on campus and their rural constituents by mandating that each land-grant institution establish a Cooperative Extension Service Office that would develop practical applications of research-related information and share that knowledge through educational programs and published outreach materials.⁹

Corvallis College (now Oregon State University) became Oregon's land-grant school in 1868, six years after the passage of the first Morrill Act. The Oregon legislature founded Oregon Agricultural Experiment Station (OAES) twenty years later, and the Oregon Extension Service (OES) got its start in 1911.¹⁰ Together, the three units provide a structure for implementing the ideals of the Morrill, Hatch, and Smith-Lever acts. The triumvirate of education, research, and extension expanded over the next 100 years to include eleven OAES branch stations in fifteen locations, thirty-six county OES offices, and more than 700 scientists, researchers, educators, and field agents.¹¹

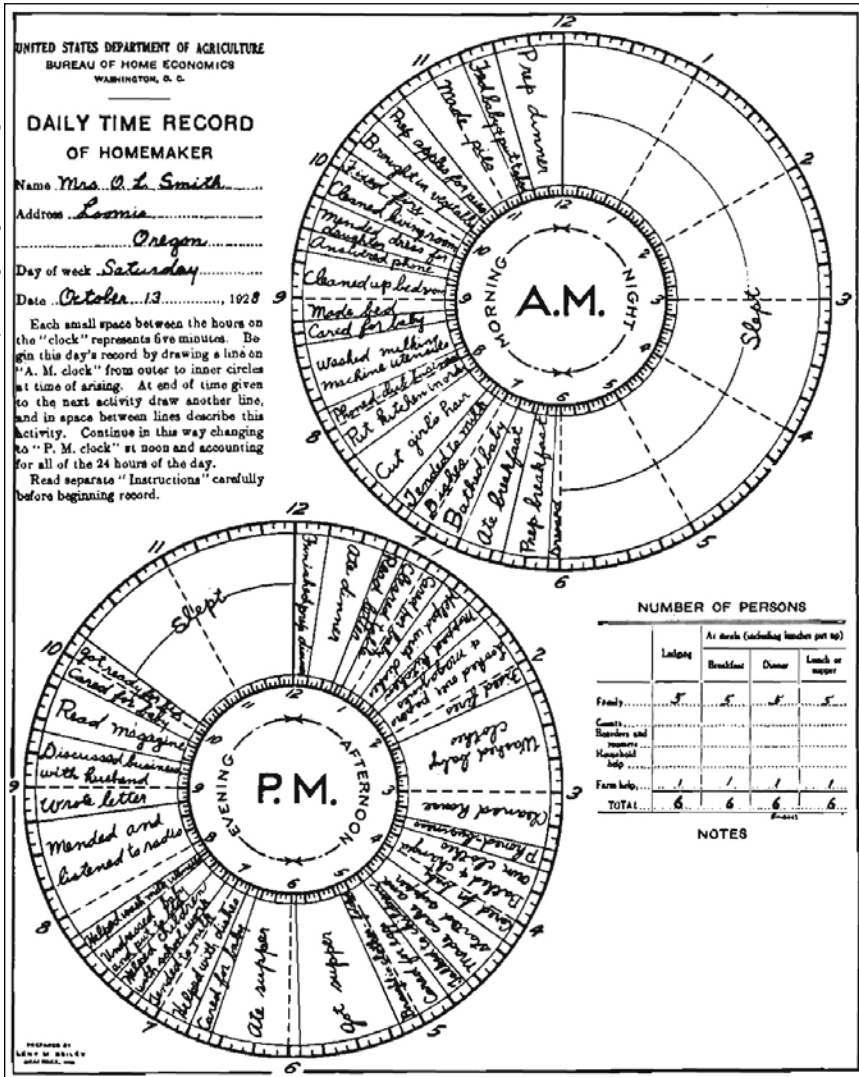
Extension and Experiment Station Communications publications over that century provide information on topics as diverse as animal husbandry, range management, crop production, weed control, agricultural business practices, food preparation and preservation, home gardening, beach safety, and sibling relationships. Within ScholarsArchive@osu, more than

8,000 EESC publications are separated into collections, based on subject matter, audience, time period, originating unit, or some combination of these categories. OAES collections tend to be research-focused and scholarly in nature, while OES collections include more practical applications created for the general public. Readers can get a sense of the historical development of OAES and OES by perusing EESC collections, starting with the earliest dated title and ending with the most recent. The OAES-authored Station Bulletins, for instance, originated in the late 1880s and originally focused on delivering practical science applications to small farmers. Early publications provided information on subjects such as soil analysis, crop production, insect control, and livestock management. As the years progressed, however, the scope of topics expanded. In the early 1930s, for example, as sport fishing gained in popularity, the Oregon State Game Commission recruited OAES researchers to assess the diet of Oregon trout in anticipation of a more thorough study of fish conservation.¹²

The breadth of the Station Bulletin collection also grew when OAES added women to its roster of researchers. The newly hired faculty studied a number of rural homemaking practices. In *Use of Time by Oregon Farm Homemakers* (1929), Maud Wilson studied farm homemakers' time management practices in comparison to those of their non-farm counterparts. Wilson noted that homemakers

made up the single largest occupation group in the United States at the time and argued that the homemaker's job should prove as "interesting and healthful and stimulating as any other occupation open to her."¹³ Clara Edaburn conducted research on Oregon housewives' work attire in *Sleeves for Work Dresses* (1951). The publication describes problems with tearing sleeves due to the strains of raising and lowering arms during day-to-day work and details a number of construction techniques designed to withstand the rigors of household tasks. Edaburn also suggests — and provides instructions for — adapting the patterns to men's and children's clothing.¹⁴

By the late 1950s, OAES researchers responded to the growth and development of Oregon suburban life with publications relevant to the new bedroom communities. *Economics of Bulk Milk Dispensers for Home Use* (1959) recommended home milk dispensers to combat a 13.5 percent decline in per capita milk consumption due at least in part to rising home delivery prices. The study featured Norris Home Dispensers, which consisted of two three-gallon cans, a refrigeration unit, adjustable thermostat, and dispensing valve, in eighty-seven Portland, Oregon, homes. Research results indicated milk consumption increased approximately 24 percent after households began installing the \$135 units, but the authors concluded bulk dispensers "appeared best adapted to large families in higher income levels," because the higher costs of increased



This is an example of a homemaker's daily time record from Maud Wilson's *Use of Time* by Oregon Farm Homemakers (1929). The record indicates the amount of time this homemaker spent preparing meals, cleaning the home, caring for children, recreating (reading and letter writing), and sleeping.

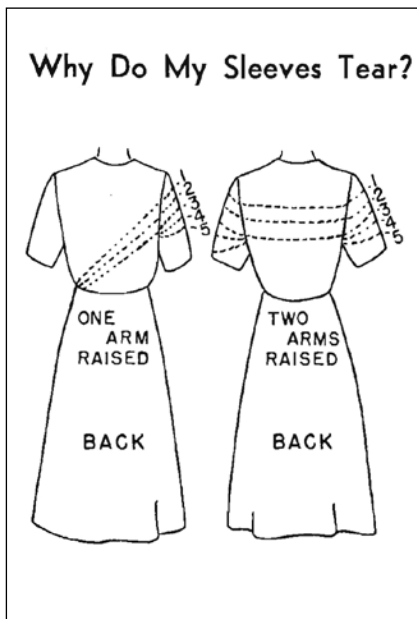
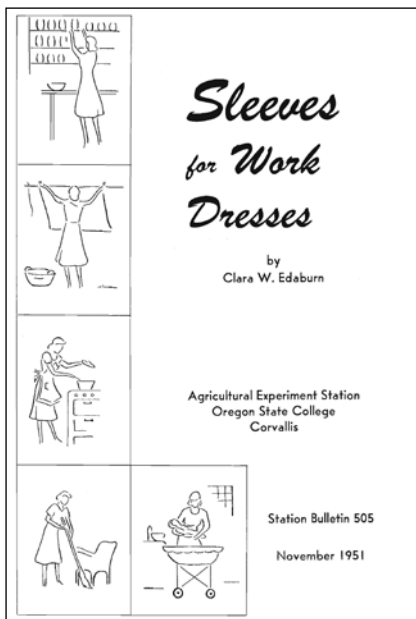
consumption negatively affected family budgets.¹⁵ Researchers also turned their attention to suburban homeowners' needs related to their larger yards;

publications focused on establishing and maintaining home lawns and consumer purchasing habits of nursery stock and landscaping tools.¹⁶

The recession of the early 1980s, with its high unemployment rates in industries that also saw high import rates, broadened the scope of Station Bulletins yet again. Groups and industries affected by layoffs — and the national media — called for corrective measures, which prompted closer scrutiny of U.S. foreign trade policies.¹⁷ *The Impact of International Trade on U.S. Employment Levels and Composition* (1985) provides a three-part theoretical context to international trade and employs fifteen years (1975–1982) of statistical data to describe and discuss the impact imports had on U.S. employment rates during that time

period.¹⁸ The number of Station Bulletins tapered during the late 1990s, and other OAES-created series followed a similar trajectory. Publications started out addressing agricultural needs, expanded to include other topics, and ultimately died out, often due to shrinking budgets. Unlike OAES collections, several OES-created series have managed — so far — to survive. The oldest and largest of these is the Extension Circulars. Materials in the collection were developed to furnish information to farming operations and home gardeners. The first title, *Improving Bee Pollination of Commercial Caneberries*, was published in 1900,

Courtesy of Oregon Agricultural Experiment Station



Courtesy of Oregon Agricultural Experiment Station

Oregon housewives in the 1950s used Clara W. Edaburn's sleeve designs to create work dresses that could withstand the rigors of performing typical household tasks. Using one arm or two and reaching to different heights caused tears in sleeves corresponding to the numbers indicated in the above illustration. *Sleeves for Work Dresses* (1951) provided a variety of solutions and included instructions for sleeve construction.

and the most recent, *Got a Stream? Grow Plants!*, in 2014. Because EESC materials date from October 1888, the collections offer a firsthand view of the evolution of scientific principles and practices. As knowledge and technologies progressed, procedures and protocols that once seemed valid were replaced with more modern methods.

The historical use of pesticides and insecticides in Oregon, which is documented through a number of EESC publications, provides one example of how publications can be used to trace scientific change. *Bulletin No. 2: Horticulture*, written in 1889, just months after the establishment of OAES, recommended orchard owners use Paris green, a highly toxic green-colored compound, or London purple, a toxic by-product from dyes, to combat the devastating work of the codling moth; multiple experiments had documented the effectiveness of both products. The bulletin characterized any orchardist unable or unwilling to apply one of the arsenical pesticides to his fruit trees as a “thrifless cultivator.” Scientists feared untreated orchards would serve as breeding grounds for moths, whose large numbers might reduce the effectiveness of spraying on nearby properties.¹⁹ Subsequent publications — *Paris Green* (1898), *Garden Crops* (1917), *House Ants* (1946), and *Vegetable Garden Insect-Pest Control* (1947) — further extolled the virtues of Paris green, a sentiment matched by the international scientific community.²⁰

By the late 1940s, however, OAES researchers began recommending dichlorodiphenyltrichloroethane

(DDT) over Paris green. During World War II, the pesticide had been hailed as nothing short of miraculous because of its success in combating potentially devastating Italian typhus and malaria epidemics — events the retreating Germans hoped to trigger by destroying sanitation and mosquito-controlling dike systems. The Nobel Prize Committee awarded Chemist Paul H. Müller the Nobel Prize for Medicine in 1948 because of his work with the pesticide, noting: “DDT has been used in large quantities in the evacuation of concentration camps, of prisoners and deportees. Without any doubt, the material has already preserved the life and health of hundreds of thousands.”²¹

EESC publications document the rise and fall of DDT for agricultural crops, starting with *Suggestions on the Use of DDT for Vegetable-Garden Insect-Pest Control*, written in July 1946. The early title established preparation strengths (3 to 5 percent) when spraying or dusting vegetable garden crops, while later publications addressed concerns regarding DDT residues after application of the insecticide.²² *DDT Residue Problems on Vegetables* (1947) cited the U.S. Food and Drug Administration’s acceptable residue levels for apples and pears — when harvested — at no more than seven p.p.m. (parts per million). The author, a chemist with the Oregon Agricultural Experiment Station, reported “extensive study has indicated that this amount is well within the limits of safety and may be used on vegetables to this extent.”²³ Two years later, however, a revised ver-

**Yesterday's Orchard...
Today's Home**

Legacy Pesticides on Former Orchard Property

D. Stone and K. Anderson

EC 1513-E • March 2009

Oregon has a rich history of orchard cultivation across the state. Today, orchards continue to be an important part of Oregon's economy and contribute to a healthy and balanced diet for the public. But, with the growth of residential development, lands that once contained orchards are being converted into homes and neighborhoods. Because of the history of pesticide use on orchard crops, there are issues to consider if you are a potential buyer of, or currently live in, a home on a former orchard.

In the past, orchard managers typically used pesticides that persisted a very long time in the environment. Some residues are still found at high levels today. The two most common pesticides used in orchards historically were lead arsenate and DDT. These pesticides are no longer registered for use in the United States. The pesticides applied in orchards today are less persistent in the environment.

Generally:

- If the property is on current or recent federal or state land, it is unlikely to have contained an orchard.
- If the property elevation is high (above 3,000 feet), it is unlikely that orchard trees grew there.

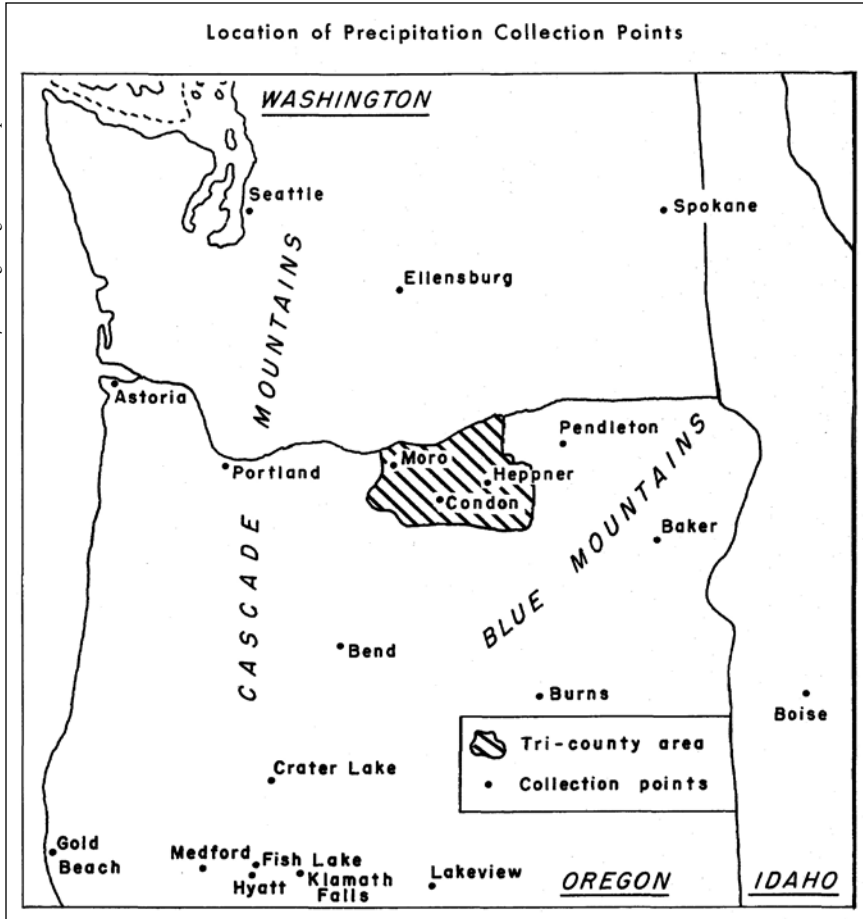
If you discover that an orchard was on the property, ask additional questions including:

- What years did the orchard operate?
- Do records of pesticide use exist?
- Were pesticides stored on the premises? Is there any record of a spill, fire, or cleanup?
- What is the source of drinking water? If it is a well, can you locate a copy of the well log to determine depth, casing, and year drilled?

Past use of pesticides such as Paris green, London purple, and DDT on Oregon farmland can raise concerns for today's home builders or buyers. Yesterday's Orchard . . . Today's Home: Legacy Pesticides on Former Orchard Property (2009) answers common questions current homeowners may have about pesticide residue.

sion of the publication, co-authored by the same chemist, noted “this amount is too high if food is consumed daily carrying that amount of residue” and exhorted growers to keep levels below 3.0 p.p.m. at harvest.²⁴ EESC adapted

its later outreach materials to reflect the more cautious recommendations coming out of the scientific community and eventually discontinued recommending the pesticide altogether, stating “it is hardly news that



This map of Oregon and Washington shows twenty precipitation collection locations used in analyzing rainwater for evidence of silver, which is often generated by silver iodide, a cloud-seeding agent. Researchers attempted to determine the efficiency of Oregon's 1950–1954 cloud-seeding operations by collecting rainwater samples both upwind and downwind of the tri-county area shown on the map.

some technical innovations farmers have used routinely for 30 years have become controversial and have been discontinued or are threatened with discontinuance. Examples in the last few years have been banning use of the

insecticide DDT (as well as many others).²⁵ In March 2009, long after DDT had fallen out of favor, EESC published *Yesterday's Orchard . . . Today's Home: Legacy Pesticides on Former Orchard Property*. The publication cautions

people who are considering building or owning a home on orchard land because of the possible adverse health effects of residual pesticides, such as Paris green, London purple, and DDT. The pamphlet also provides additional information on soil sampling, whom to contact about treatment options, and how to minimize exposure to residue if it exists.²⁶

The use of DDT is not the only controversial scientific advance to play a part in OAES history. The short-lived history of cloud seeding for agricultural purposes in Oregon is also documented in EESC publications. Cloud seeding — the process of manipulating precipitation patterns using silver iodide or dry ice — had its beginnings in a 1946 General Electric Research Lab in Schenectady, New York.²⁷ Experiments in a lab setting proved insufficient. The procedure needed experimentation on a larger scale (and in the natural environment) to determine its economic viability. OAES Assistant Water Forecaster R.T. Beaumont wrote the subject's first OAES publication in 1951, *An Analysis of Cloud-Seeding Operations in North Central Oregon*. The report describes OAES's independent evaluation of a project conducted by a commercial cloud-seeding operator for interested wheat growers from Sherman, Gil-

liam, and Morrow counties. Oregon wheat growers were willing to explore cloud seeding but wanted OAES to independently verify any changes in precipitation levels during the rainmaking project. OAES agreed to analyze the operation and also devised a payment formula based on rainfall increases or decreases.²⁸

OAES carried out the pilot project over a ten-month period beginning September 1, 1950, and running through June 30, 1951. When the operation ended and the OAES analy-



mtSci, Museum of Innovation and Science

American chemist Vincent Shaeffer is largely credited with discovering the principle of cloud-seeding while working in a General Electric Research Lab in Schenectady, New York. His work eventually led to cloud-seeding projects in Oregon, where farmers from the tri-county area contracted with OAES to independently evaluate commercial cloud-seeding-operations.

sis showed no discernible effect on rainfall, Beaumont cautioned against drawing conclusions based on the short-lived experiment and recommended the project continue in order to gather additional data.²⁹ The second seed-clouding publication, *Analysis of Four Years of Attempts to Increase Precipitation by Cloud Seeding in Tri-County Area, Oregon, 1950–1954*, documented the next phase of the rainmaking project.³⁰ Trials were held annually during the same ten-month period, but different operators with different methods conducted the trials during the experiment's last two years.³¹ For this and other reasons, such as suspect data, lack of control groups, and increased rainfall within normal ranges, OAES concluded the cloud-seeding operations' experimental design was flawed.³² OAES, therefore, used the project to research the best method for evaluating seeding operations and laid out detailed recommendations for future projects that would meet the standards of scientific research.³³ Apparently, OAES's foray into cloud-seeding evaluation ended there, as no post-1954 cloud-seeding publications are available.

Just as with DDT, the evolution of cloud seeding in Oregon generally mirrored investigations taking place across the nation and the globe. EESC researchers, however, reacted to local and regional developments unfolding before them.

Both OAES and OES responded to the general public's need for information when Mount St. Helens (located approximately 150 miles north of the

Corvallis campus) erupted on May 18, 1980. The nine items in the Volcanic Ash Information collection, written in response to the eruption, advised citizens about living with the resulting ash fallout. *Volcanic Ash — Health Hazards* (1980) encouraged those with pre-existing lung disease to wear face masks, and *Protective Face Masks* (1980) detailed which would provide the protection consumers needed. *Cleaning Volcanic Ash from Clothing and Housewares* (1980) cautioned citizens about the abrasive qualities of the ash when cleaning the home, and *Cabin Fever? Tips on Raising Morale for the Housebound* recommended activities to keep spirits high during extended periods of confinement.³⁴

EESC published *Perspectives on Oregon's Taxes — An Economic Look at Measures 66 & 67* shortly before a January 26, 2010, statewide vote on two ballot measures that would increase taxes on high-income earners and corporations to support public services. This thirteen-page document discussed basic economic cause and effect and used research-based data presented in graphic format to explain the implications of raising taxes on the two groups. The author concluded:

Overall, these data and related scholarly economic research make it difficult to argue that raising Oregon's taxes in this way will be harmful to job growth. On the other hand, further decline in Oregon's public services could adversely affect Oregon's future competitiveness both nationally and internationally.³⁵

Although it is impossible to determine just how much an impact, if any, the

Oregon State UNIVERSITY | **Extension Service**

A New Pest Attacking Healthy Ripening Fruit in Oregon

Spotted wing Drosophila: *Drosophila suzukii* (Matsumura)

EM 8991 • October 2009

Infestations of the spotted wing *Drosophila* fly (Diptera: Drosophilidae), an exotic pest, have been found in Oregon fruits in 13 counties. Of the 3,000 species of *Drosophila*, commonly known as vinegar flies, approximately 175 are known in North America. Two of these known species have been found to be harmful to crops, of which spotted wing *Drosophila* (SWD) is one. These flies can infest and cause a great deal of damage to ripening fruit, as opposed to the overripe and fallen fruit that are infested by most other *Drosophila* species. We have confirmed findings of SWD in blueberries, wild blackberries, red raspberries, Marionberries, cherries, strawberries, plums, peaches, grapes, figs, hardy kiwis, and Asian pears.

It is crucial to find infestations of this pest as early as possible, when they can still be treated effectively.



Actual size (2-3 mm)

Spotted Wing Drosophila, *Drosophila suzukii* (swd), is an invasive pest from Southeast Asia that damages fruits such as cherries, berries, peaches, and plums. After its arrival along the Pacific Coast, researchers in California, Oregon, and Washington researchers coordinated efforts to understand the insect and share the results with fruit producers and home gardeners.

publication had on the ballot's eventual passage, statistics from December 2009 (1,114 downloads) and January 2010 (1,329 downloads) indicate people were reading it; presumably, many of those readers were Oregon voters.³⁶

The response to the recent influx and spread of Spotted Wing Drosophila, *Drosophila suzukii* (swd), is another example of EESC's sharing information with Oregon citizens in a

timely manner. A native of Southeast Asia, swd is an invasive pest known to damage soft-skinned fruits such as cherries, raspberries, blackberries, blueberries, strawberries, peaches, and plums. This vinegar fly's arrival in California in 2008 and subsequent proliferation along the Pacific Coast spurred growers and researchers to immediately mount a coordinated effort to mitigate its effects. Unlike

other vinegar flies, which feast on overripe and rotting fruit, SWD attacks healthy ripening fruit, making it unmarketable.³⁷

As SWD made its way up the Pacific Coast, researchers from California, Oregon, and Washington coordinated a region-wide, federally funded research project to better understand the insect.³⁸ Information from the research project was shared with other scientists through formal, scholarly articles published in peer-reviewed journals. While valuable to other researchers, the articles hold limited appeal for average citizens. EESC therefore worked with OAES and OES personnel to produce educational outreach materials more appropriate for the general public. *A New Pest Attacking Healthy Ripening Fruit in Oregon* (2009) warned fruit producers of the potentially devastating effects of SWD, and one year later, *Recognize Fruit Damage from Spotted Wing Drosophila (SWD)* (2010) aided growers in detecting early fruit infestation. *Protecting Garden Fruits from Spotted Wing Drosophila* (2011) encouraged home and community gardeners to take an active role in helping protect Oregon's commercial fruit.³⁹

While EESC publications help trace the trajectory of science, the materials also provide sociologists and other users an opportunity to observe the historical development of Oregon's — and the nation's — social mores. Women's role in society is one cultural shift documented through the collections' materials. Because the earliest

publications reported results of agricultural research — and farming was, at the time, perceived as a man's domain — women's concerns and interests received little attention. One of the first titles to acknowledge a woman's role on the farm, *Some Points in Choosing Textiles* (1917), described homemakers' break with tradition in producing cloth for family linens and clothing and their recent reliance on goods manufactured outside homes. The author cautioned women about the inferiority of mass-produced textiles and provided information on identifying different materials and recognizing fabric quality.⁴⁰ Five years later, *The Organization and Field of Extension Work in Agriculture and Home Economics in Oregon* (1922) described the expansion of Extension programs into areas relevant to housewives and homemakers — “corrective diet for children and adults,” school hot lunches, making and renovating clothing, house planning and kitchen design, home furnishings selection and care, landscape maintenance, labor-saving methods, family budgeting, recreation, “and occasionally in hand work such as basketry.”⁴¹ Throughout much of the twentieth century, EESC publications depicted women attending to traditional homemaking duties, albeit with a nod to the latest technological advances. Publications might encourage homemakers to use modern materials and employ contemporary housekeeping methods, but women still performed their responsibilities largely within the confines of the family home.

In *Member Attitude Toward Cooperatives* (1952), however, Assistant Agricultural Economist Gerald E. Korzan attempted to encourage male-dominated farmers' cooperatives to "include women in planning and organization" within those marketing and purchasing associations.⁴² Although his studies demonstrated a lukewarm response from farmers regarding the importance of women within the organizations, Korzan recognized farmwomen's purchasing power, business acumen, and ability to involve the entire family in cooperative business. Nonetheless, most other EESC titles written in the 1950s — whether they targeted rural or suburban residents — largely represented a culture of men as breadwinners and family leaders and as women played supporters in roles as homemakers and family caretakers.⁴³ During the second half of the twentieth century, EESC materials depicted a gradual shift in expectations for women. *When Death Comes* (1963) recommended involving women in previously "men's only" territory. The publication dealt with the legal and financial considerations of funerals and funeral expenses, and the author warned both sexes: "the days when finances were solely the business and concern of the husband are gone." According to Miller, the life expectancy and marriage patterns of women left them with, on average, sixteen years of widowhood, making it imperative they had at least a basic understanding of the family's financial matters.⁴⁴ Another indication of changing social

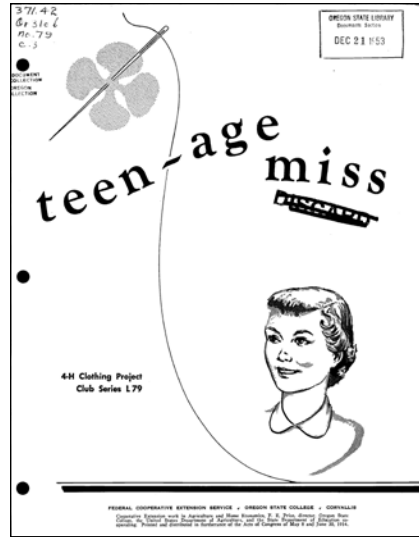
expectations for women was their inclusion in the workforce. *Teenagers: Who Are They . . .* (1966) states girls in the 1960s could expect to spend twenty-five years employed away from the family residence.⁴⁵

Women's increased roles inside and outside the home still did not give them equal status in the eyes of the nation. Women might participate in farm organizations' endeavors, share in financial activities and decision-making, and even contribute to the family income. Their place in society, however, was still rooted in caring for others and still undervalued by cultural norms. The aforementioned Volcanic Ash collection title, *Cabin Fever? Tips on Raising Morale for the Housebound* (1980), never mentioned which gender was responsible for raising household morale, but the suggestion to take a "bubble bath . . . dress for dinner . . . get your hair done or give yourself a manicure" leaves little doubt in readers' minds as to who did what — and for whom.⁴⁶ *Sharing the Responsibilities of Parent Care: Sibling Relationships in Later Life* (1995) also reveals stereotypical beliefs about men's capabilities and men's lingering attitudes toward traditional women's roles. The publication acknowledges the different roles siblings play when caring for elderly parents, explaining brothers usually provide assistance in "typically male areas of expertise, such as financial management or home repairs" and may "resist his sister's efforts to involve him with the physical aspects of care because

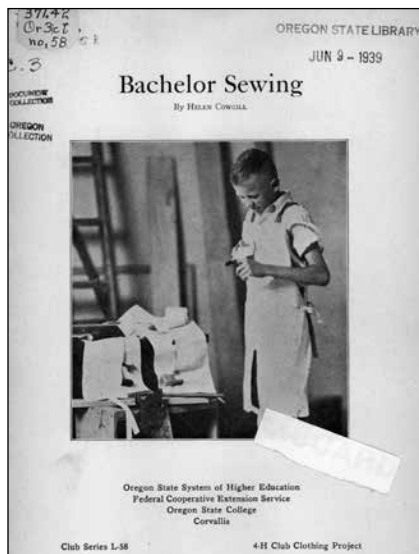
he views it as ‘women’s work’.”⁴⁷ *Growing Your Peer Learning Network* (2013) recognized the increasing number of women managing forests and rangelands and advocated for a modern, empowering, peer-learning approach to meet their unique needs. The publication strongly advocates and endorses women’s leadership and break from traditional roles, but one forest owner’s comment about only feeling comfortable asking “stupid” questions when in the company of women reveals sometimes women felt uncomfortable in professional spaces traditionally dominated by men.⁴⁸

Readers can also explore the evolution of gender roles with EESC publications. The 4-H series, dating to the mid 1930s, provides an engaging and uncomplicated look at our country’s attitudes and beliefs about previous generations of young people. The first leaders’ guide, *Information for Local Leaders* (1939), extolled the program’s virtues: “Four-H Club work teaches through doing, better practices in agriculture and home economics . . . above all, it develops the highest type of manhood and womanhood and American citizenship.”⁴⁹ During the 1930s, manhood and womanhood were clearly defined for boys and girls — agriculture was for men (boys), and home economics was for women (girls). Livestock projects and camp cookery were designated for boys, and homemaking projects and home cookery were for girls.

Titles such as *Teen-Age Miss* (1939) and *Bachelor Sewing* (1939) illustrate how expectations for girls and boys



Courtesy of Oregon State University Extension Service



Courtesy of Oregon State University Extension Service

Land grant institutions’ Extension agencies have overseen the well-known 4-H youth organization and published materials in support of local club activities. Perusing early titles like Teen Age Miss and Bachelor Sewing offers a firsthand look at gender norms expected of young adults in mid-century American life.

differed for similar activities. While both publications were written as part of the 4-H Club Clothing Project, they instructed girls to construct articles of clothing, such as blouses and dresses, and boys chose either camp- or carpenter-related accessories, such as emergency kits and carpenter's aprons. *Teen-Age Miss* exhorted girls to "take greater care in personal daintiness," which included "bathing daily, removing armpit hair, using deodorant or antiperspirant, and taking special care to obtain 'lovely soft elbows.'" Boys were expected to get dirty but were admonished to be, at least on occasion, "clean and well-groomed." Similar to many other 4-H titles, *Teen-Age Miss* ends with a call for service to others: "Do you ever get a wonderful feeling from doing something for others? Of course you do; everyone does, for it is a part of gracious living to help others." In stark contrast, *Bachelor Sewing* ends with instructions for making either a knife or hatchet sheath.⁵⁰

During the 1940s, publications such as *Growth and Health Project: a Manual for Local Leaders* (1941) encouraged 4-H leaders to arrange contests to single out one boy and one girl from each club who embodied the best physical condition. Dentists and doctors examined club members and produced scores based on criteria such as hearing, sight, and tooth decay. Local winners could advance to state competitions, and winning state members between ages fifteen and eighteen could go on to the national competition in Chicago.⁵¹ The same publication suggested club members

record and map tooth decay in their schoolroom, using a black pin to indicate their classmates' cavities. Each time a cavity was filled, the black pin could be removed, leading to a "whiter and better" looking map.⁵² While such tactics became less popular over time, measuring the health and wellbeing of youth remained a topic of great interest. Between the 1940s and 1980s, 4-H publications shifted from encouraging steady weight gain to making diet suggestions in response to increasing adolescent obesity rates. *Tantalizing Tidbits for Teens: Dr. Quack's Quickie Weight Loss Diets* (1984) urged teens to avoid fad diets and follow a sensible weight loss plan.⁵³ Four years later, 4-H leaders received additional advice on counseling overweight teens in *Foods of the Pacific Northwest* (1988).⁵⁴

EESC publications represent more than one hundred years of OSU research and outreach and allow readers to explore Oregon's past — and its present — through an agriculture-based lens. While this article establishes the materials' historical value, the science contained within the publications should not go unrecognized. OAES researchers and OES field agents work with their counterparts across the nation to address issues such as childhood obesity, climate change, food safety, global food security, and sustainable bioenergy — all of which have worldwide implications. As more land-grant institutions make their Agricultural Experiment Station and Extension Service materials publicly available via the Internet, the growing corpus

opens the country's research to the international community.⁵⁵ Nearly two hundred years ago, Abraham Lincoln publicly expressed his aspiration to "contribute something" to the

education of the general public. The land-grant system's mission to disseminate research and research-based information, in service to the nation, is a testament to that commitment.⁵⁶

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