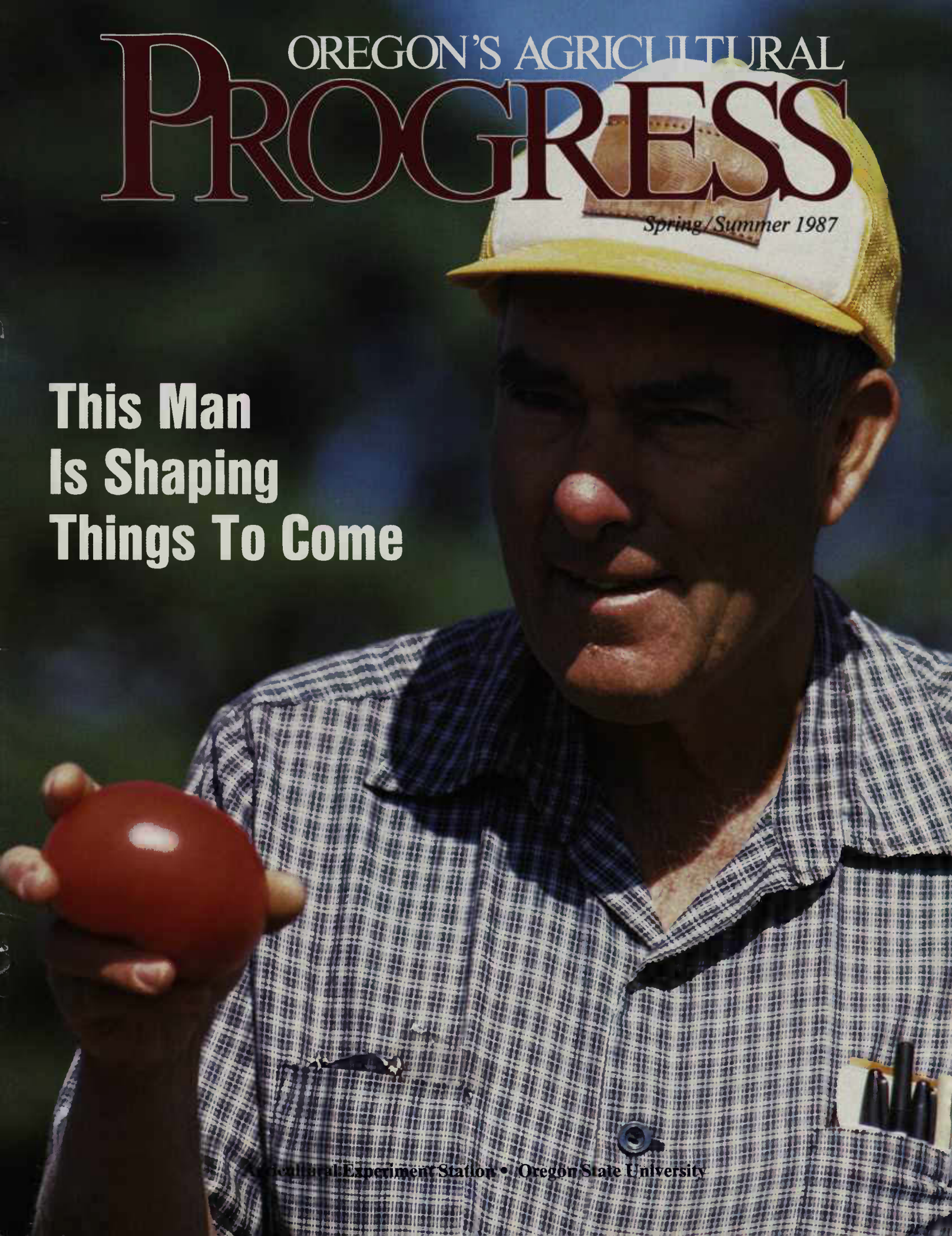
OREGON'S AGRICULTURAL

PROGRESS

Spring/Summer 1987



This Man Is Shaping Things To Come

Agricultural Experiment Station • Oregon State University

THE EDITOR'S NOTE

"Research is one thing you can put too much money into and still get your money's worth."

I heard Steve Davis, acting director of the Experiment Station, quote and praise this witticism at a recent campus meeting.

I didn't get it. Why, exactly, do you like the saying, I asked Davis later? What does it mean?

He explained that a longtime Oregon farmer had called it to his attention. Originally, the observation came from the fertile mind of Reub Long, the Fort Rock rancher and philosopher who's been described as Oregon's answer to Will Rogers (Reub Long died in 1974).

"I like the way it captures contradictory points," he said, adding that while some people do think too much is spent on research, others think you can never invest too much. There are too many paybacks, and you never know where they'll come from, or when.

Around that same time, I received a folder from the Cooperative State Research Service in Washington, D.C. That USDA unit coordinates the activities of the agricultural experiment stations in Oregon and other states, which are federal-state partnerships.

The folder was overflowing with information about the centennial of the Hatch Act, the law Grover Cleveland signed on March 2, 1887, to set up our nationwide system of agricultural experiment stations.

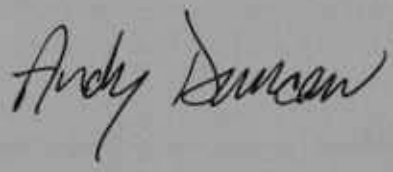
Looking through it, I learned that Barney Clark's mechanical heart, fire retardant space flight suits and the daily newspaper all have their roots in agricultural research.

I read about "The Search for Life," an exhibit at the Smithsonian Institution on the contribution agricultural research has made to American life, from better food to a higher standard of living (the exhibit includes a "cell theatre" that examines the promises of the future).

All this started me thinking about what Oregon was like before its agricultural experiment station was set up in 1888, the year after Cleveland signed the Hatch Act.

I won't bore you with my reflections on how farmers, ranchers, researchers, extension agents and others in agriculture have changed life in this state. But I will say this:

I believe peeking into the past gave me a little more insight into what Reub Long had on his mind.



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Cover: OSU horticulturist Jim Baggett. See story, page 6 (photo by Dave King).

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TWO-TON WINTER

Winter hay costs are a major expense for Eastern Oregon ranchers.

Researchers at the Eastern Oregon Agricultural Research Center, which is headquartered at Burns, are continuing to study just what lengths cold and hungry range cattle will go to for a meal.

"It takes two tons of hay to get a cow through the winter in most locations in Eastern Oregon, and that's a major expense for ranchers," says Marty Vavra, superintendent of the research center, operated jointly by OSU and USDA's Agricultural Research Service.

"This is really an exploratory look at three options to feeding hay: winter grazing, fawn fescue and rake-bunched hay," he said.

Range scientist Dave Ganskopp and others initiated a grazing experiment this winter at the center's Squaw Butte research facility west of Burns.

"Instead of bringing cattle into the meadows for the winter, we brought them in in late summer and sent them back out on the range for the winter," said Ganskopp. "We were hoping to get in a month and a half of late-fall grazing and maybe get them going again in late February and March, which aren't traditional months to use the range."

Squaw Butte normally receives quite a bit of snow, and the researchers had hay there, ready to feed the animals when they gave up trying to forage. But the winter was so mild, and snowfall so light, they grazed all winter.

"We picked a good year to start," said Ganskopp. But probably a type that will come along only once a decade or so, he added.

One of Ganskopp's primary interests is the animals' behavior.

"I want to know how much time they spend feeding, and how far they will walk in a day, which could be another index of how much effort they put into grazing," he said.

To measure that, he put devices called vibracorders on some of the cows. Clocks inside the devices respond to vibrations and record grazing times.

No conclusions could be drawn from just one year's data, even if the weather had been more normal, says the researcher. After wintering on the range, the cattle had lost about 100 pounds more than cattle fed hay, a loss that "isn't all that bad," according to Ganskopp.

Now animal scientist Harley Turner is accumulating data on calving rates among cows that spent the winter on the range, on the weight and condition of their calves, and on how long it takes the cows to become pregnant again.

Vavra points out that an added benefit of winter range grazing would be that flood meadows in Eastern Oregon, now cut for hay production, could be grazed from August until October, a time of poor forage on the desert range.

"At that time, calves are still with the cows," he said, "which means they would pick up some weight. And cows could put on more weight going into the winter."

Another option the scientists have under study is having cattle graze on fields of fawn fescue, a grass, in late winter. Vavra has three years' data on that from experiments done at the Union branch of the Eastern Oregon research center.

With the experimental technique, fawn fescue is planted, irrigated and grazed or cut for hay so that, when cold weather arrives in the fall and turns the grass dormant, it is leafy and standing about 10 inches high.

Cattle put on the land in late winter to graze on the relatively nutritious standing forage are given a little hay, grain or cottonseed meal to supplement the nutrients they get from the fescue.

"Basically, you put it in areas of low-value farm lands," said Vavra. "It's for mature cattle. It puts too much stress on young cattle."

A third option to baling hay and feeding it to cattle in the winter is using rake-bunched hay. Studied by animal scientist Harley Turner, it already has been put into practical use with the Eastern Oregon research center's cattle.

With that system, meadow hay is cut in the summer, raked into piles, and left there. Cattle are fenced into the meadow during the winter and eat hay from the piles, burrowing through the snow, when necessary.

Ray Angell, a forage specialist, is cooperating with Vavra, Ganskopp and Turner on the studies, primarily by studying forage quality.

NEW WHEAT

The seed of Oveson, a new soft white winter wheat variety, is available for Oregon farmers—particularly in the northeastern part of the state—to plant next fall.

Oveson was developed at the Columbia Basin Agricultural Research Center at Pendleton by researchers Chuck Rohde, W. B. Locke, D. A. Nason, C. R. Crampton and K. H. Van Wagoner.

It is a semi-dwarf variety with moderately stiff straw. The variety appears to be adapted to the higher rainfall (over 15 inches a year) areas of northeastern Oregon. It is resistant to stripe rust and moderately resistant to Cephalosporium stripe.

Oveson seed is available through OSU's Foundation Seed Program on campus, according to Greg Vollmer, program manager. Interested growers should contact their county Extension Service agent.

The name Oveson was chosen to recognize Merrill M. Oveson, who was superintendent of OSU's Sherman and Pendleton branch experiment stations from 1938 until his retirement in 1966.

YOUTH'S FOLLY

Apparently age does have its beauty.

Bruce Coblentz, OSU wildlife scientist, did some serious observing of young and old brown pelicans a while back in Great Lameshur Bay of St. John Island in the Virgin Islands. The birds he studied are the same kind that Oregonians watch off the Oregon Coast during the summer.

Numerous studies of such fish-eating birds, which wheel in the air and dive for their food, have shown that adults forage more efficiently than immature birds. Scientists have come up with differing reasons for this.

"I couldn't distinguish differences in their plunge-diving technique or in where they were diving," said Coblentz. "But I noticed a difference in behavior before a dive."

In an article in the *Journal of Field Ornithology,* Coblentz explained that adult pelicans often wheel as if beginning a plunge-dive, then pause with the body wheeling to point in a more downward direction, or the body pitching upward with the bill pointing down. Then they resume their searches.

"This behavior appears to allow a brief evaluation of the bird's probability of success," said Coblentz. They fly on if the chances of success don't look good enough, he added.

"I never saw immature pelicans pause or turn without completing the plunge-dive," he said. Also, search flights of the adults were significantly longer, up to 65 percent longer, he found.

For maturity then, three cheers?

DO YOU SMOKE?

Do you use antihistamines? Smoke tobacco? Have you eaten fresh fruits, vegetables or other products that were sprayed with insecticides and not washed? If the answer to any of these questions is yes, then you might be interested in the research David Williams is doing.

Williams, an assistant professor of food science at OSU, is studying how an enzyme called flavin-containing-monooxygenase changes the toxicity of many chemicals humans commonly encounter.

He discovered the enzyme four years ago in rabbit lungs. But humans lungs produce the same enzyme, says Williams.

Usually, the enzyme breaks down toxic chemicals in the body. But it can have the reverse effect.

"There are cases, and those are the ones I want to focus on," says Williams, "where the activity of this enzyme produces a more toxic effect."

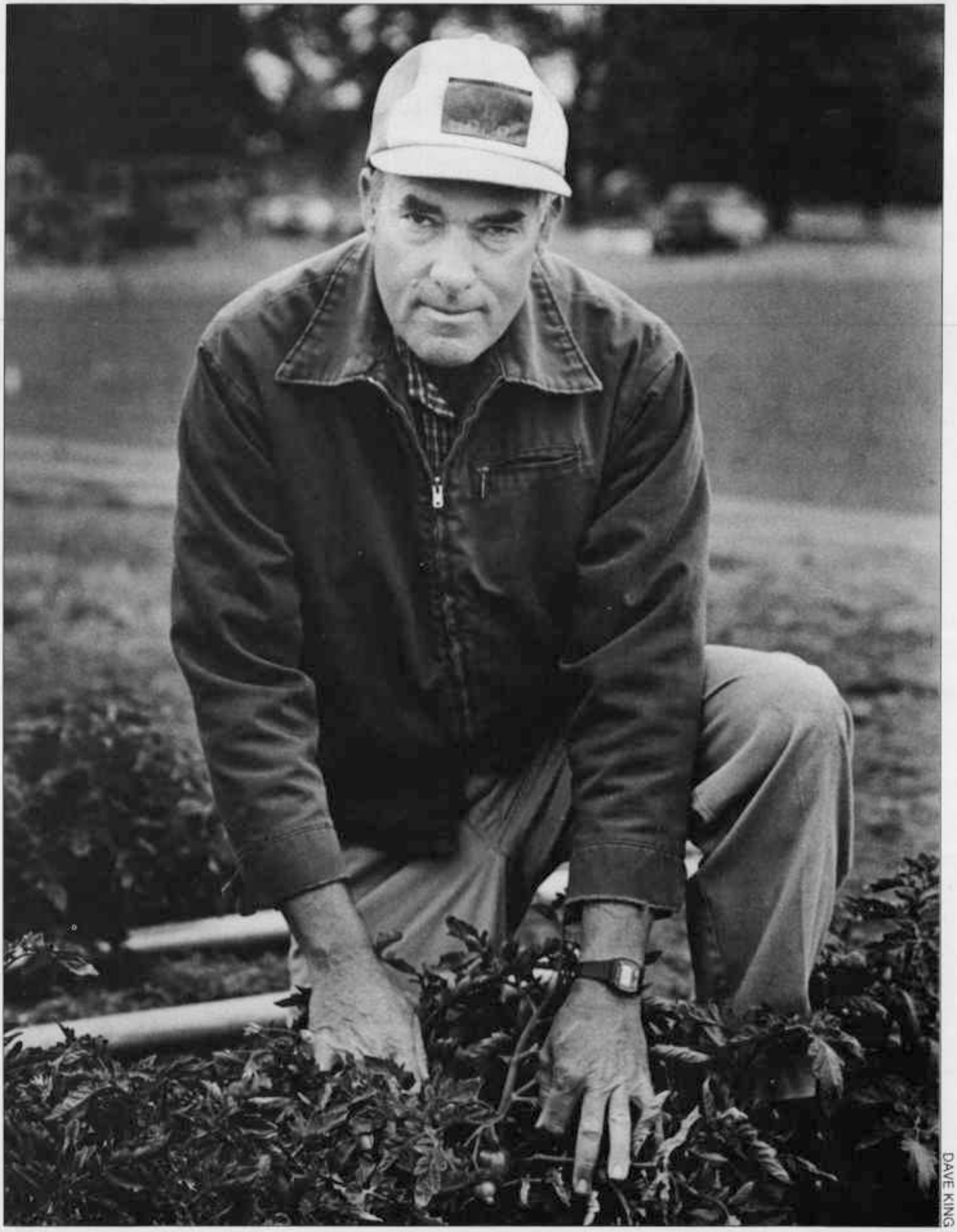
Before investigating how the enzyme is produced or what its implications are for humanity, Williams is trying to gather more basic information about it. He plans to use a "New Investigator Research Award" from the National Institutes of Health to study the version produced in the lungs.

Discovering which chemicals the enzyme makes more toxic is one aim of his research. Chemicals he is testing include common insecticide ingredients, drugs used in prescribed tranquilizers and antihistamines, and nicotine. He also is applying for a permit to test cocaine.

Williams also hopes to discover where the enzyme is located in lung cells. He plans to compare the enzyme produced in the lungs with the kind produced in the liver.

"Right now," he says, "my major thrust . . . is to more fully characterize the properties of this enzyme."

DAVE KING



DAVE KING

For more than 30 years, Jim Baggett has been creating new vegetables for Oregon

MR. GREEN GENES

BY HOLLY HARDIN

Some people dream of writing the great American novel, a classic. Others labor to produce a piece of sculpture that will rival Michaelangelo's "David," or a painting like da Vinci's "Mona Lisa." In a way, these artists are striving for a link to future generations, for immortality.

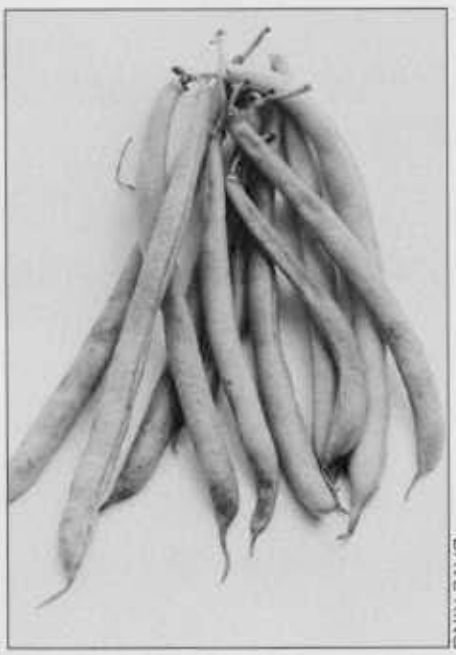
You could think of Jim Baggett as an artist in his own right. His studio is a greenhouse, and his creations will live and grow long after he is dead.

Baggett is a vegetable breeder. He has spent more than 30 years in OSU's horticulture department taking established varieties of green beans, peas, tomatoes, broccoli, cauliflower and other vegetables from other parts of the world and tailoring them into new varieties that will grow well in the long, cool seasons of western Oregon and Washington.

"I didn't know what the word horticulture meant when I was growing up," he says, recalling his boyhood on a farm near Twin Falls, Idaho. "But I knew I was interested in vegetables pretty early on."

He attended the University of Idaho after World War II and came to OSU in 1952 for graduate school, later joining the horticulture department faculty.

The work he's spent his professional life doing sounds simple. You want a green bean plant with long pods that ripen in the second week of August. Cross a green bean plant that has long pods with one whose pods ripen the second week of August, right? Unfortunately, it's not that easy. Baggett says it takes him about 10 years to create and refine most new vegetable varieties.



DAVE KING

Opposite page: OSU vegetable breeder Jim Baggett examines early-fruiting tomatoes. Above: Green beans.

First of all, to make the result worth the effort, he usually tries to combine desirable characteristics from several plants. Bean color, size, uniform shape, growth rate and disease resistance are only a few of the factors he considers.

Putting the desirable traits into one plant takes several generations of crossing plants and selecting the best offspring for future crosses. And when Baggett finally has combined the traits he wants, it takes two to four years to produce the six plant generations necessary to establish a true breeding line.

A breeding line is an intermediate product in the process that usually is a genetically stable combination of characteristics. Baggett makes some breeding lines available to commercial firms and growers. He refines other promising ones further and releases them to the public as new varieties.

Although the process can be speeded up by growing some plant generations in greenhouses, that takes time too. It makes some of Baggett's statistics eye-catching: In the last 12 years alone, the Experiment Station scientist has released more than 45 new vegetable varieties and breeding lines. This rate of production is probably the equivalent of an author writing two or three novels a year over that period. But despite the large number of releases, only a few of his creations have been "best-sellers" to western Oregon and Washington vegetable growers, the realistic Baggett points out.

"I've released five varieties of beans during my career," he says, trying to frame the chances of success. "Out of five, only one has been successful. That's probably a pretty good percentage in this business."

Success with a vegetable variety is often the result of "an ounce of foresight and a ton of luck," he says.

That's because the needs and preferences of consumers can change from one year to the next. And even when a vegetable breeder correctly predicts the qualities that will meet growers' and consumers' needs in future years, vegetable processors' needs or disease and pest problems can change, undercutting the lengthy breeding process.

He used this approach with what he considers his most important creation.

As a hedge, Baggett maintains several breeding lines of important Oregon crops such as peas and beans. Having this "pool of genes" makes it easier for him to assemble a particular combination of characteristics, if the need arises.

It's not always possible to know how a variety will be accepted, even at the moment it is released. In fact, Baggett sometimes releases several varieties at once, allowing people to determine through experience which, if any, they like. He used this approach with what he considers his most important creation, the Oregon 91 green bean.

In 1981 and 1982, Baggett responded to western Oregon growers' demands for a new green bean variety by releasing five: He named them Oregon 17, 43, 55, 83 and 91. They were similar. All were bush beans designed for commercial processing. All had firm, straight, dark green pods like Blue Lake, a variety of pole bean that was the most popular green bean grown in Oregon until about 1965, when the industry switched from pole to bush beans because they were easier to harvest.

For several years, growers and processors tested Baggett's five varieties. Eventually, Oregon 91 emerged as the clear favorite of growers and processors. Today, more than 80 percent of the green beans processed in Oregon are OSU's Oregon 91 variety.

Baggett points out that Oregon 91 actually had its start in 1948—32 years before he released it—when former OSU horticulture professor William Frazier, his graduate school mentor, began work on the problem of producing a bush bean that had the good flavor of the Blue Lake-type pole bean.

"We got the bush beans with Blue Lake pods pretty easy," says Baggett, who worked with Frazier and then took over his research when he retired. "But over the years it was a struggle to get the plant characteristics we wanted."

You may think seeing such an overwhelming number of commercial growers choose a variety he created would give Baggett a hint of the feeling of immortality for which artists strive. Again, he takes the realistic view, explaining that Oregon 91 no doubt will be replaced one day by another variety. He hopes to be the one who releases it, he adds.

He grows most of his experimental plants—row after row of them—on OSU's 60-acre Vegetable Farm just east of Corvallis. Most of the breeding work is funded by and directed toward commercial growers, although of course it can benefit consumers by providing less expensive and higher quality vegetables and enchancing the vegetable industry's positive impact on the economy.

However, some varieties he releases are aimed at home gardeners.

"Breeding for the gardeners is a separate dimension," he says. "It's all

He is laboring in the shadow of emerging technology.

part of the program, but the incentive's a little different." A big part of the payoff is enthusiasm.

"If you release something from OSU, the Oregon gardeners will perk up their ears right away," he says, smiling at the thought. "You'd be surprised how many home gardeners are interested in early tomatoes, and how they appreciate getting a new variety from Oregon and not from someplace else."

Baggett's most recent tomato releases for home gardeners, varieties called Oregon Spring and Santiam, are no exception. Their fruit ripens sooner than any Northwest tomato variety of comparable size. Gold Nugget, a very early-ripening and prolific golden cherry tomato he developed, also is receiving excellent reviews from gardeners.

Gardeners and commercial growers aren't the only ones interested in his vegetables. He and other breeders share breeding material, usually seeds, in a never-ending search for desirable vegetable genes.

"We get requests for these introductions from all over the world, just as we obtain breeding material wherever we can find it," he says.

OSU vegetable varieties have "parentage" that includes genetic material from Hawaii, New York, England, Greece, the U.S.S.R. and Ethiopia, says Baggett.

But regardless of where a vegetable breeder gets seeds, or how seeds are grown, the time factor mentioned earlier always seems to be an obstacle. Baggett doesn't believe that will change dramatically in the near future. But he does acknowledge that he is laboring in the shadow of emerging technology that could bolster and speed the production of new vegetables. He is referring to biotechnologists' experimentation with genetic engineering, tissue culturing and other techniques.

PHOTOS BY DAVE KING

Opposite page and top: Baggett-developed cabbage and tomatoes. Above: Growing up, he didn't know what horticulture meant. But he was "interested in vegetables pretty early on," says Baggett, shown here getting ready to plant bean seeds in an experimental OSU plot.

"They are always going to need plant breeders."

For example, scientists are attempting to enhance resistance to herbicides by scraping millions of a plant's cells into a laboratory dish and dousing them with a chemical. The idea is to use the cells that live to regenerate plants that are very similar to the original plant, with the added advantage that they are resistant to that chemical.

That's an example of improving plants developed with conventional breeding methods. Other techniques, such as moving desirable genes from plant to plant with genetic engineering, or a process called protoplast fusion where the centers of cells from different plants are combined directly, are shortcuts past the crossing process used in conventional breeding, theoretically. But they haven't produced any commercial vegetable varieties yet, and when they do it won't erase the need for scientists like Baggett.

"It's impossible to do vegetable breeding, or any plant breeding, in a test tube," says David Mok, a biotechnologist who is one of Baggett's colleagues in OSU's horticulture department. "You still have to grow out millions of plants, or hundreds of thousands of plants, at different locations to make sure the qualities you are selecting for are consistent."

"It doesn't matter how you get the new varieties," says Baggett, putting it another way. "They are always going to need plant breeders to try them out."

No matter what happens, descendants of the Oregon 91 green bean and vegetables of many other shapes and colors will dot the fields of Oregon and Washington for generations. They will be living legacies reaching into the future from the hands of Jim Baggett, a different kind of artist.

Holly Hardin is an OSU journalism student.

AUTUMN OF THE RING-NECKED

It's ironic, but some people fear that a kind of death knell for the ring-necked pheasant should be tolling across the Willamette Valley, over the farm fields where this most popular of the upland game birds was first successfully introduced to the United States more than a century ago.

Certainly, the birds won't become extinct. But the last of the State of Oregon's stocking pheasants will be released this fall. And the fear is that, in practical terms, that will pretty much lead to the end of hunting of the bird on public lands in the Valley, where it arrived from Central Asia and China in 1881.

Because of budget restrictions, and a changing environment, the Oregon Department of Fish and Wildlife is shifting its stocking effort to the French red-legged partridge and other game birds it hopes will be more self-sufficient.

"We will be shifting directions."

Agency officials had the option of considering a user-fee to finance the pheasant stocking program, a fee plan based on economic data gathered by OSU researchers. But the ODFW's proposal to the Legislature was to leave pheasant hunting in the Willamette Valley to the private sector, and to let hunters travel to Eastern Oregon areas such as Malheur County and the Columbia Basin, where the ring-necked pheasant can make it on its own.

"If we were to continue, we'd try to develop the stocking program around a user-pay model," said Ken Durbin, ODFW bird biologist. "But, for now, with the upsurge in development of private shooting preserves, we will be shifting directions."

Durbin adds that only a small percentage—about 10 percent—of the pheasants bagged in Oregon each year are stocked birds. However, a relatively large number of hunters use the stocked public hunting areas in the Willamette Valley, primarily because the majority of Oregon's people are in the Valley.

The user-pay model was flushed out by the OSU researchers last fall, after ODFW initially decided against continuing the state pheasant-stocking program, as an alternative method of financing the program.

The OSU study applied economic measurements in a relatively novel manner, gathering objective information and attaching values to elements of the kind of wildlife issue usually left to emotional and political banterings.

The results suggested widespread willingness by hunters to support a public ring-necked pheasant stocking program.

Opposite page: A male ring-necked pheasant. Such birds were transplanted to the Willamette Valley from Central Asia in 1881.

DAVE KING

BY ED CURTIN

Indeed, Willamette Valley hunters, already thought to spend an average of $11 per daily hunting trip while expecting barely one bagged bird every two times out, seemed to be quite willing to pay an average of $16.50 per season for the privilege and challenge of stalking the ring-necked pheasant.

Hunters said they would be willing to pay.

Richard Adams, the OSU agricultural and resource economist who developed the study, says all but two of 97 pheasant hunters surveyed expressed agreement with some user-fee plan to maintain the ring-necked pheasant stocking program in the Willamette Valley. These hunters were part of the total group of Western Oregon pheasant hunters who are thought to spend more than 14,000 days a year stalking the prized bird.

"The results indicate the strong feelings upland hunters have for maintaining a public pheasant program," Adams said. "That's an exceptionally high positive response rate among any group of recreational participants." In some cases, the OSU professor adds, hunters said they would be willing to pay up to $50 a year for a pheasant tag, stamp, or other means of fee recording.

What social scientists call hypothetical basis, where people who are questioned in surveys answer incorrectly because they are dealing with an issue in the abstract, probably was not much of a factor in this study, Adams believes.

"Most hunters already knew the program was probably going to be eliminated if they didn't pay, that the program was on the ropes, so to speak," he said. "And we were careful to point that out again. The incentive to cheat, if you will, just wasn't there."

Adams, Lynn M. Musser, an assistant professor of psychology in OSU's College of Liberal Arts, and several graduate students conducted the survey at the E.E. Wilson public-access wildlife area near Corvallis. Adams initiated the survey as a chance opportunity to apply economic tools to a public policy action.

JERRY PICKRELL

DOUG MACKEY, U.S. Fish and Wildlife Service

DAVE KING

Left: Flushed, a ring-necked pheasant takes to the sky. Top: Fall pheasant hunters on the William L. Finley National Wildlife Refuge in the southern Willamette Valley. Above: Some of the last pheasants at the state-operated E.E. Wilson Wildlife Area near Corvallis.

DAVE KING

DAVE KING

Top: A mature male French red-legged partridge. The Oregon Department of Fish and Wildlife hopes such birds, when stocked, will fare better than the ring-necked pheasant. Above: ODFW's Larry Cooper places French red-legged partridge eggs in an incubator at the E.E. Wilson Wildlife Area.

ODFW's decision had nothing to do with chance.

Since the 1930s, the State of Oregon has released thousands of ring-necked pheasants each year, first to introduce the birds to all parts of the state, then to supplement populations that were temporarily low. In the Willamette Valley, changes in farming practices and loss of natural habitat have sharply reduced the populations, especially during the past 15 to 20 years.

It has been the stocking program that has enabled many hunters in western Oregon to maintain their recreational pastime.

The predators make off with the young again and again.

The agricultural changes meant farmers no longer were keeping fields fallow for several years, as once was the case. They now push crop production to the limit, often plowing under or burning the tall, dense stands of grasses and weeds that protect the pheasant nests and provide the birds with their basic diet of seeds and leaves.

What's left are narrow strips along fence and field lines that make the birds easy prey for predators, especially hawks and foxes. When pheasant chicks are taken, the hens build yet another nest and lay a second clutch of eggs, usually with similar results. And as the predators make off with the young again and again, the hens get a late start on molting and don't gain their needed winter weight, resulting in a loss of their numbers as well.

The overall effect is the kind of population loss biologists have noted over the past 15 to 20 years. Indeed, today's pheasant flocks are only one-tenth the number of birds in the 1960s, experts estimate. The vast majority of birds bagged in the state are on preserves or in Eastern Oregon.

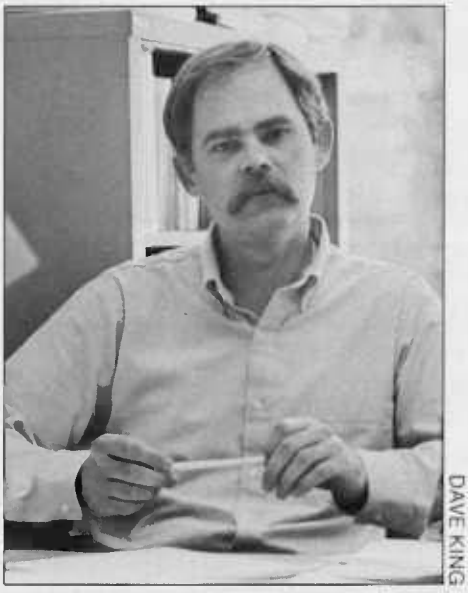
Without ODFW stocking on the state and federal wildlife refuges in the Willamette Valley, some wildlife biologists believe the populations in the Willamette Valley will decrease to such low levels that hunting of the ring-necked pheasant, except on preserves, will be pretty much eliminated.

JIM GLADSON, Oregon Department of Fish and Wildlife

A century later, in 1981, ODFW bird biologist Ken Durbin celebrated the centennial of the first successful release of the ring-necked pheasant in the United States by re-enacting the event. The original release was near the town of Lebanon in Western Oregon's Willamette Valley.

However, Durbin doesn't agree with that assessment. He says there are still "pockets of good habitat in the Willamette Valley" where ring-necked pheasant hunting will survive.

The cost of the stocking program was expensive, making it a prime target for ODFW managers forced to tighten the department's purse strings. According to estimates, it would have cost between $60,000 and $80,000 each year during the 1987-89 biennium to allow the release of some 10,000 pheasants a year from the fish and wildlife department's E.E. Wilson Hatchery north of Corvallis. Like the trout and other ODFW stocking programs, money for the stocking program came from the wildlife fund, which is financed with hunting licenses and tag fees.



DAVE KING

Agricultural economist Richard Adams

Some biologists objected to the "chicken-farm" cycle.

Other methods of maintaining the hunting populations, such as predator control programs, were suggested as recently as 10 years ago, but were considered to be even more expensive, potentially. Also, some of the key predators are federally protected birds like hawks and owls.

With limited revenue, then, debate within the Department of Fish and Wildlife focused on what would be the best use of the funds, according to Durbin. Some biologists objected to the "chicken farm" cycle of the ring-necked pheasant stocking program: raising the birds for almost immediate death by hunters or predators.

"It was decided to work with other birds that might have better potential for being self-sufficient after being stocked," Durbin said. Besides the red-legged partridge mentioned earlier, ODFW officials also are looking at the state of Michigan, which is two years into a program of stocking a different strain of pheasant from the People's Republic of China.

If the state had decided to continue stocking ring-necked pheasants, Adams' estimate is that a user-fee of about $13.50 a year per pheasant hunter would have generated the greatest level of funds, a level sufficient to maintain the program.

The $13.50 estimate is less than the $16.50 average the hunters in the survey said they would be willing to pay, Adams says. That is because the survey found that some hunters would drop out of the program if the fee were higher. The ODFW would need to balance increased revenue against declining participation.

The survey accumlated some other interesting information about pheasant hunters. For example, success apparently has little to do with a willingness to pay up to $50 to continue pheasant hunting at such places as E. E. Wilson or other public hunting areas. Sixty percent of those surveyed had yet to bag a bird!

Fifty percent of those questioned said they would go to the trouble and expense of scheduling hunting trips to Eastern Oregon to continue hunting the ring-necked pheasant if the stocking program was discontinued and birds weren't available west of the Cascades. The other half said they would drop pheasant hunting as an autumn recreational activity.

"The hunters aren't out there just to bag their birds," said Adams. "According to what they said in the survey, it is the opportunity to hunt, to walk around the harvested fields in the warm October sun, working their dogs, enjoying the camaraderie of other hunters .... It's not just the desire to shoot birds. It's the total outdoors experience."

Though, apparently, there will be no reprieve for public stocking of the ring-necked pheasant, Adams believes such surveys are worthwhile.

"As resource managers face shrinking budgets," he said, "a pay-as-you-go approach may be the only way to save specific programs. The procedures used in this research offer a way for public officials to measure the potential success of user fees on a case-by-case basis."

Ed Curtin, a free-lance writer, lives in Corvallis, Oregon.

No one knows exactly what damage these tiny creatures could do to Oregon's bee industry

THE KILLER MITES

BY DAVE KING

In action not unlike what you might see when professional wrestling's Hulk Hogan takes on Andre the Giant, tiny tracheal mites are threatening to put a chokehold on some West Coast honeybees, and their keepers. Meanwhile, OSU researchers are heading into the ring to try and minimize the pain with a move of their own.

Tracheal mites are small enough for a hundred of them to live comfortably in the quarter-inch-long trachea, or breathing tube, of an adult honeybee. They cause no obvious problems. You can't look at a bee and know if it's infested with mites.

From the mites point of view, they're not doing anything wrong. But they spell economic, and possibly biological, trouble for beekeepers in Oregon, California and Canada.

In 1986, difficulty in detecting mite infestations brought the Oregon State Beekeepers Association knocking on the laboratory door of OSU entomology research associate Becky Fichter.

"The problem began in 1984," explains Fichter, "when the tracheal mite was introduced to the eastern United States and spread across the country. It reached Oregon in 1985. This mite was not known to cause a lot of damage, but it was suspected that it could if it invaded the pristine bee populations of Oregon."

One problem, it was feared, would come as the result of a bee triangle involving Oregon, California and Canada.

In California, there are people who make part of their living raising queen bees and selling them to Canadian beekeepers. They ship the queens, already bred, to Canada in the spring as replacements for queens that die during the harsh Canadian winter.

Many Oregon beekeepers make money using their insects as honey producers and as crop pollinators, in Oregon and in California's vast agricultural industry.

Could one or two mites have caused the destruction?

"The Oregon connection comes into play in that Oregon beekeepers supply a lot of material to California," says Fichter. Canadian beekeepers are adamant about not wanting tracheal mites to get a throathold in their country, which has forced California beekeepers to consider establishing a quarantine to keep tracheal mites out of their insects.

When the infested bees showed up in Oregon in 1985, the entire 100 colonies were destroyed. Was that a waste? Could one or two mites in one or two bees have caused the destruction of thousands of dollars worth of bees? This is the question Oregon beekeepers brought to Fichter and OSU entomology colleagues Mike Burgett, a bee

A researcher, searching for trachel mites, prepares a honey bee for dissection.

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expert, and Jerry Krantz, a mite specialist. They didn't know the answer, but they may have found a way to make sure the question doesn't come up again—and to keep a mite infestation from ballooning into unaffected bee populations. It involves a quick and precise way of detecting infested bees.

To explain it, Fichter begins by explaining what it takes to find one mite in one bee with the traditional detection method.

"What they are doing now is dissecting one bee at a time," she says. "They cut the trachea out and scan it under a microscope to see if they can see any mites."

Obviously, the process is costly and time consuming. Dissection can cost from $15 to $20 per bee colony and take up to two weeks.

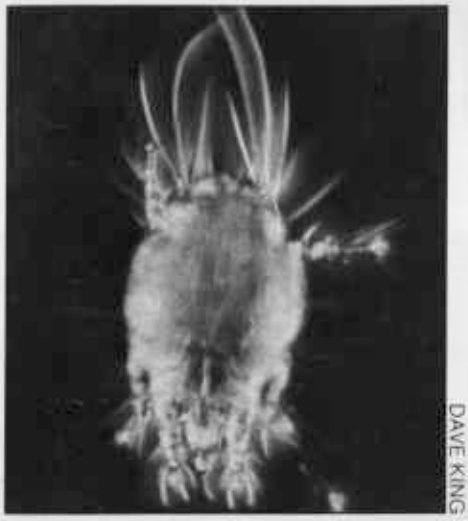
"Because transporting bees at a specific time is important in the pollination process, to coincide with the spring bloom," says Fichter, "you can't possibly run all the samples needed to get the results back before the bees are shipped off. A lot of bees have been moved without knowing if they were mite-free. If they are found to be infested later, there could be real problems."

"We think we have a successful test."

Considering this, Fichter, Burgett and Krantz began wondering if you could detect the mites using enzyme-linked immunosorbent assay, a horribly technical-sounding procedure commonly known among scientists as ELISA. The test relies on antibodies to identify telltale proteins associated with various organisms. It is used to detect viral diseases of plant crops, a variant of the test is used by medical researchers to detect AIDS antibodies in blood, and it is being adapted to detect trichinosis in pork. The equipment needed is widely available.

"We proposed to use ELISA because we believe it may be sensitive enough to detect down to one mite in a

Left: The tedious dissection method of detecting trachel mites is costly and can take up to two weeks to produce results, says entomologist Becky Fichter, shown here.



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50-bee sample," says Fichter. "It can also be used quickly, cheaply and easily on individual colonies rather than lumping 50 or so colonies together."

For more than a year, the researchers have been trying to remold the standard ELISA test for mite detection. They've taken the critical step of producing antibodies that can identify proteins found only in the tracheal mites.

Trying to eradicate it does not appear to be a cost-effective goal.

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Above: Fichter displays an ELISA test tray. When ground bee material is placed in the solution in the cups, the speedy test tells researchers if trachel mites are present. Top: A microscopic trachel mite magnified 100 times.

"Basically," says Fichter, "we think we have a successful test that will recognize this mite and only this mite—not honeybee material and not two other closely related mites that live on honeybees."

"But right now it's still just a laboratory tool," she adds. "It hasn't moved out into the commercial sector at all."

The researchers are checking the reliability of the test.

"If a bee is infested," says Fichter, "how often are we able to detect that infestation? Similarly, if a bee is not infested, do we get a negative result on our test?"

The speed and preciseness of the test will make it very attractive if it proves to be reliable, Fichter believes. Normally, ELISA costs run between $1 and $5 per sample. They can be done in half a day, sometimes. These factors could have a major affect on beekeepers' ability to monitor their colonies.

No one yet knows what biological damage the mites could do.

In England, where low levels of the mites are prevalent, they don't seem to cause much damage. But the tiny mites seem to have found some muscle when they crossed the ocean to North America in 1984.

"There seems to be a change in how they respond to local environments," says Fichter. "The best data I've seen from North America from last season indicates that low densities do no obvious damage, but high rates of infestation decrease brood production, decrease honey production and result in greater overwintering mortality to the point of actually killing colonies."

Fichter says that, as in many other agricultural situations involving crop-pest relationships, it may be best to merely track the tracheal mite and keep it under control. Trying to eradicate it does not appear to be a cost-effective goal.

Considering that, it appears she, her OSU colleagues and other entomologists in the affected areas are preparing to become referees in a never-ending wrestling match between the tracheal mite and the honeybee.

Dave King is a writer and radio-television producer in OSU's agricultural communications office.

WHACK TO T

Despite microwaves and automatic washers, farm women are work

Turning on the lights in the beginning years of this century usually meant trimming the wick, filling the lantern and striking the match.

Taking a bath not only required drawing water from the pump and hauling it to the house, but heating it on the stove and pouring it into the tub, too.

Preparing meals was grinding flour, preserving vegetables and making do with farm-supplied meat. But it also was splitting wood for the fire and keeping the flames burning evenly.

And it was all farm women's work, each and every bit of it.

With that in mind, it is easy to say that farm women have seen and made great progress in the kinds of responsibilities they have at home. But maybe not as much as today's glittering array of dishwashers and blenders, automatic washers and dryers, microwave ovens and vacuum cleaners might suggest.

In fact, some may doubt that all is very much different—let alone improved—for farm women today, compared to 50 and 60 years ago. And in part, that thought seems to be substantiated by the findings of a work-time study, conducted by OSU researchers.

Ashes don't have to be cleaned from the cooking and heating stoves.

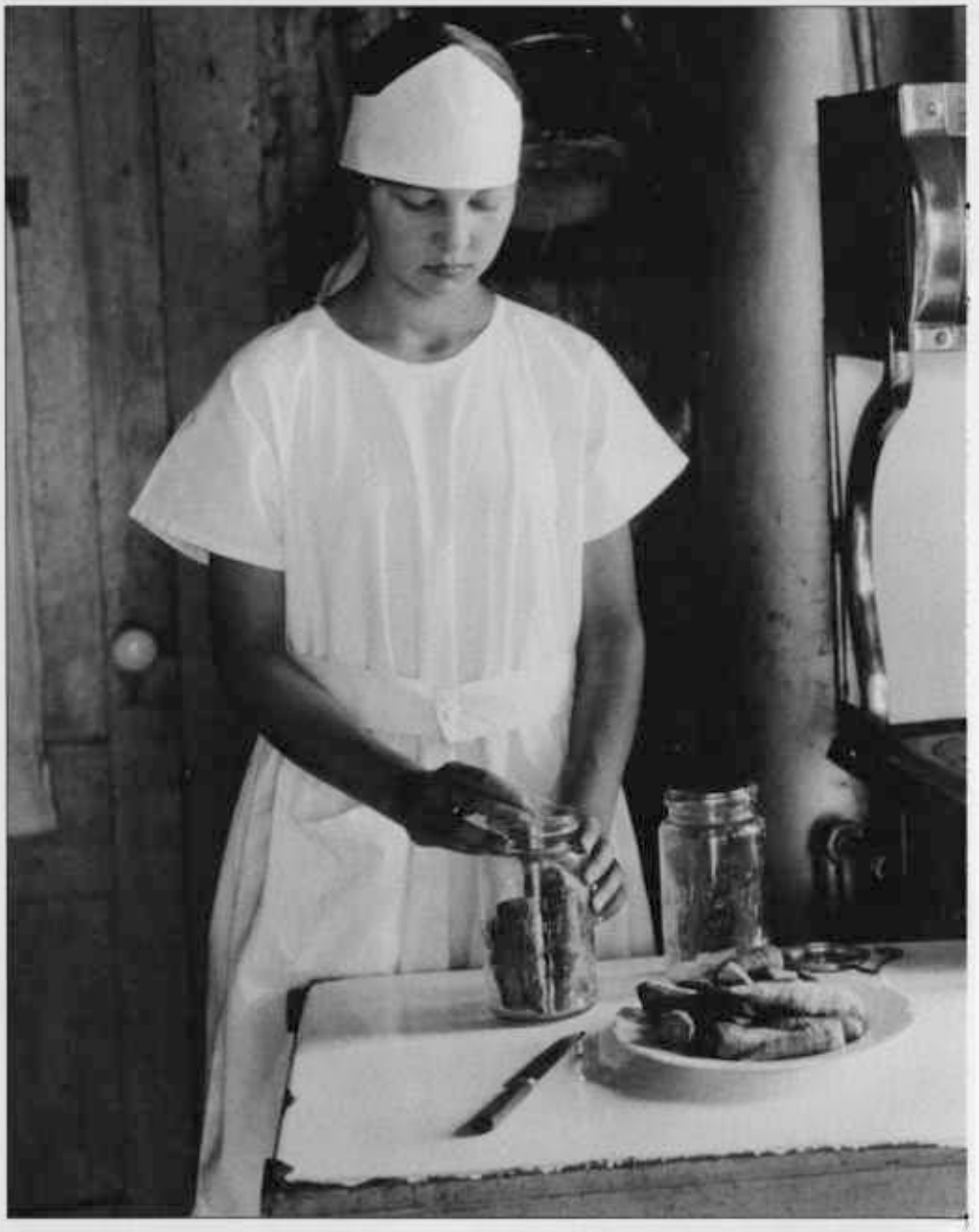
The results of the comparative study, published recently by Jane Meiners and Geraldine Olson, faculty members in the OSU College of Home Economics, indicate that not much has changed around the house for the farm women of the 1980s, at least when looking at total time spent on household chores and responsibilities.

"Think of all the stereotypes," says Meiners, "and you've got the basic situation for women now."

Overall, farm women today spend upward to 50 hours a week on household tasks, just about as much time as their mothers and grandmothers did before them, the study found.

Today's farm women, with all the countertop appliances and prepared food products, still spend nearly 15 hours a week preparing meals and cleaning up afterwards, Meiners says. Their housecleaning and maintenance work take up 11 hours; washing and sewing clothes use seven hours; direct care of children about nine hours; shopping six hours; and family management and finance two hours.

Those allocations push the time farm women spend on household responsibilities up to the 49-hour-a-week level, virtually the same as their counterparts in the 1920s. Farm women of two generations ago averaged about 51 hours of household work a week, according to the report by Meiners and Olson, who heads the home economics college's department of family resource management.



THE FUTURE

king as long and hard as ever, an OSU home economics study shows

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Top: Canning carrots, circa 1925. Left: A 1987 electric can opener.

Just as significant, the researchers say, is how the distribution of work hours among various subcategories of household work has varied over the years, even while the total hours are about the same.

The biggest change downward is in food preparation and cleanup, a decline from 47 percent to 31 percent of the average farm woman's household work week. Care and construction of clothing dropped from 22 percent to 14 percent.

Filling the voids are housework, up from 18 percent to 22 percent; shopping, up from 3 percent to 11 percent; and care of family members, especially children, up a whopping 11 percent to 18 percent of a woman's weekly responsibilities.

Certainly such conveniences as water heaters, central heating, electricity and indoor plumbing make such tasks as cooking and washing dishes and clothes much easier, says Meiners. Ashes don't have to be cleaned from the cooking and heating stoves. Food doesn't have to be prepared for the hired help, or for neighbors dropping by at mealtime. Restaurants are available for quick and relatively inexpensive meals out, when time shortages crunch schedules.

The time has been filled with other things.

"But we also found that much more time is spent in the care of children now than in the 1920s and 30s," she said. "We, as a culture, have changed our standards in caring for children. We give them more direct attention—playing, helping with homework, chauffeuring them to school and piano lessons."

Consequently, the more children a family has, and the younger those children are, the more work a woman will do, the researchers found. That relationship was as true in the 1920s and 30s as it is today, they say.

The basis of the research by Olson and Meiners was a series of studies sponsored by agricultural experiment stations across the country 50 years ago. Initiated by the old Bureau of Home Economics in the U.S. Department of Agriculture, the studies sought information on what household activities demanded the most time and energy of women. With an eye toward the future, it was hoped that new and time-saving products and strategies could be devised to lessen the housework and free women for more production work on the farm.

Coincidentally, the work on which Olson and Meiners built their comparative analysis was conducted by another OSU researcher, Maud Wilson.

Wilson was the first full-time researcher hired in the OSU School of Home Economics, and her 1929 research at the old Oregon Agricultural College (now OSU) is considered to be the best of the early Bureau of Home Economics studies. Hers are still used as the benchmark on which all others are gauged.

Society today seems to demand more child care.

Both the 1920s and present-day studies were based on households of four people. The present-day data Meiners and Olson used came from information gathered in the late 1970s from two-parent, two-child families in 11 states. In both time periods, researchers studied the average household work time of all farm women, whether or not they worked outside the home.

Today, people may remember grandmothers referring to Mondays as "wash day." According to Meiners and Olson, emphasis should be placed on the "day" part.

Doing laundry then was boiling pots of water and dipping clothes in them with a strong stick to prevent burning. There was the soap pot, the starching stage, blueing, bleaching, rinsing, hanging on the line to dry, sprinkling, and then ironing with a flatiron heated on the stove.

"It was heavy and hot work," Meiners tells her students. "And exhausting work. We researched the time involved because we can measure time. But just think about the human energy that went into tasks. It was tremendous, but we can't measure it."

Improvements over the past 50 or 60 years seem to save some of that energy, but the time has been filled with other things, Meiners says.

Buying household goods at the supermarket and shopping center means spending more time shopping and traveling to and from those places.

Nowadays, farm women tend to keep homes "nicer," perhaps allowing for more visiting among families.

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Above: Home economics researchers Geraldine Olson, left, and Jane Meiners. Below: Modern appliances such as microwave ovens save time, but there is new work around the house, the study showed.

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"Women are constantly doing a juggling act."

Some of the gain from improved household products and equipment seems to be countervailed by an almost immediate raising of standards for household, meal and clothing quality.

Children on the farms in the 1920s were thought to be in safe environments: They entertained themselves and, when they grew older, took on many household and farm chores. Society today seems to demand more childcare, from direct supervision of play to intense preparation for school. It adds significant hours to a farm woman's work week, says the report.

Regardless of why, it seems that the work was—and is—there.

"Whether it is now or in the 1920s," says Meiners, "we've found that farm women are constantly doing a juggling act with their many work demands."

—Ed Curtin

A CLASH WITH ANN LANDERS

Margy Woodburn just wanted to set the record straight when she wrote Ann Landers.

She got more than she bargained for, a spat with the famous newspaper advice columnist that was witnessed by people across the country.

It was last year. Ann Landers advised a reader to throw away an old can of tuna, saying it might cause botulism.

"I wrote in to say that her advice encouraged people to throw away food which was perfectly safe," Woodburn recalls.

Landers printed the letter, along with one of her spicy retorts. This one was to the effect that, to her, risking a case of deadly poisoning to save a can of tuna fish didn't seem particularly bright.

Woodburn received about two dozen letters in response to the exchange.

"Fortunately," she says, "all of them were friendly, people seeking more information."

One elderly man told her his wife had had a stroke recently. He was doing the cooking and wondered which of the foods his wife had canned were safe.

Woodburn responded to each letter, explaining that canned foods can lose some of their color, taste and nutritive value over time, but that botulism or other dangerous organisms cannot grow in properly canned foods, unless the canning container is damaged.

Seems like a situation most people would just as soon avoid. But such touchy, potentually deadly, controversies are part of Woodburn's everyday world. The head of OSU's foods and nutrition department has spent much of her career investigating food toxins.

In fact, food has been important to her most of her life. Growing up on an Illinois farm, she learned early about raising, preserving and cooking it. Later, she pursued her interest in food research as a home economics major at the University of Illinois, where she developed a fascination with microbiology.

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Margy Woodburn

"I wanted to apply microbiology to something that was practical," she says, "and I was more interested in the consumer level than in medical research."

Food safety research let her do that.

Today, as an Experiment Station and national expert on food-borne illness and its prevention, she teaches courses for OSU undergraduate and graduate students, and offers workshops and summer courses for extension agents in Oregon and over the West Coast. She also serves as a consultant on food safety for many organizations.

It can lead to some pretty strange situations, including testifying in trials involving food poisoning.

As the Ann Landers incident suggests, the most dramatic situations often involve the bacteria that cause botulism, which are some of the most deadly organisms known to man and once killed half their victims (the fatality rate for botulism poisoning now is down to about 12 percent).

Despite Woodburn's scientific credentials, it is hard to change people's opinions, she has found.

"Because everybody eats, everybody becomes an expert on food," she says.

Even professionals sometimes resist. A few years ago, Woodburn developed some new guidelines for inactivating botulism toxin in home-canned salmon. Her oven method proved more practical than the traditional boiling method and preserved the flavor and texture of the fish better. But food specialists in one state did not accept her recommendations.

In fact, an extension agent from that state withdrew from an OSU summer course on food safety that Woodburn was teaching. The agent said the course was too controversial.

Woodburn's primary aims are to educate American families and restaurant owners and workers about food safety. She does that through the standard methods: workshops, trade journal articles, classes. But she also considers it her duty to journey into less conventional arenas. That's where the letter to Ann Landers—and many other entries into public discussions to correct misinformation—occur.

After the exchange with Landers, she received more comments from people on campus than she does for major scientific activities. A vice president of the university told her that relatives in another state had called him to say they'd seen some publicity about OSU, something they'd never done in all his years at the school.

A colleague sent her a note saying he was sorry to find out that it wasn't just his students who couldn't read.

"What he was getting at," says Woodburn, "is that Ann Landers completely missed the point. There's no question of safety if the (food) can isn't damaged."

Knowing what she knows now, that Ann Landers usually has the last word, would she write her again?

"I think so," says Woodburn. "This was not my first letter to the media, and I have often found a good response from them. It's a good way to put our research findings to use."

—Holly Hardin

The Killer Mites

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