

Oregon's Agricultural
Progress
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ANNUAL INDEX INSIDE



Agricultural Experiment Station
Oregon State University

**Who are the
small farmers?**



comment

Director John R. Davis

A common cause

This is the year of POLITICS.

The speeches with their promises, claims and counterclaims; the primaries . . . and then the November election. Such political action is dynamic. Interactions between people and their beliefs also are dynamic because tactics and philosophies constantly shift. Policies, too, change, including attitudes toward various organizations and groups.

With such change in the wind, what will politics deal to rural America—to production agriculture, to international trade in food and feed products, to small farms and rural development? And to urban America—to food prices, to availability of food and fiber, to possible fuel alternatives, to recreational opportunities? What effect will world politics, or domestic politics for that matter, have on our standard of living?

Whether you live in a rural or urban area, there is no question that successful agriculture is a key to a productive America. It is a necessity if we are to maintain a high standard of living. Because most of us pay only about 17 percent of our take-home pay for food, the rest of our salary is available for housing, education and other necessities, as well as for other things that add to the quality of life.

And because agriculture is so important to all Americans, you must believe that any change in policies brought on by the campaigns and the election should favor agriculture and rural America. Those in urban America, especially, must work to assure a strong agriculture because food prices and the international balance of trade may affect city dwellers more than those who live in the country.

In any case, all of agriculture deserves the complete support of

voters and those elected and appointed to office. Whatever a person's political beliefs, he or she should consider the platforms of the political parties and the candidates—and insist on the continued development of a strong foundation for Oregon agriculture.

Those who have small farms and those who have larger farms, urban and rural people, Republicans and Democrats, men and women, old and young—all have a stake in the future of Oregon agriculture and in our quality of living.

This is the year to make your interests count. Let the candidates know of your support for agriculture.

Then get out and vote!

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This issue of *Oregon's Agricultural Progress* highlights some of our research directed toward small farms. Although the U.S. Department of Agriculture indicated in a recent report that small farm production does not significantly affect the U.S. food supply, rural living is a way of life that is significant to many. Farms in production agriculture—mostly family farms—exemplify a good way of life, too. They provide for all of the U.S. food needs and in addition contribute to the balance of payments in international trade. ■

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Cover: Anthropologists went to Polk County to learn more about Oregon's small-scale farmers. See story, page 10 (Photo: Dave King.)

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If cattle won't roam, bring a buffalo home

Ancestors of the wild buffalo that roamed the American West through the early 1800s—until hunters nearly drove them into extinction—may be able to help ranchers in Oregon and elsewhere take advantage of forage inaccessible to cattle.

The practical-minded could draw that conclusion from findings of OSU graduate researcher Dirk Van Vuren, who shadowed one of three wild bison herds in the United States at the request of the federal Bureau of Land Management.

Van Vuren, who did the field study for his master's thesis in wildlife management under the supervision of Experiment Station scientist Bruce Coblenz, does not shrug off the idea either.

"It is possible bison could provide more efficient use of steep terrain," he said, recalling his two summers and a winter expedition (in 1977 and 1978) trailing the huge, hairy creatures through the rugged Henry Mountains of south-central Utah.

"I found a bison isn't limited by any factor except the availability of food. They'll take chances. They feed all the way up to the top of Mt. Ellen (an 11,600-foot peak)."

Van Vuren set out to study the herd of about 220 animals, transplanted to BLM land in Utah in 1941 from a wild bison herd in Yellowstone National Park, primarily because of a dispute involving cattle ranchers.

BLM employees feared the growing bison herd, and privately owned cattle driven onto the federal land in the summer to graze, would strain the area's natural ecosystem. The agency decided to cut back on the number of cattle allowed in the mountains, angering cattlemen.



Dirk Van Vuren

Van Vuren went to Utah to try to determine if the cattle and buffaloes did compete for food in the mountains—putting pressure on the same vegetation. He also wondered if bison, known to be dominant to every creature except man in North America, competed physically with the cattle.

Moving into an isolated mountain cabin, Van Vuren soon learned it is a buffalo's grit, rather than its powerful girth, that serves it best in the high country.

In simple terms, he found the cattle and bison did not fight, although they did compete for food in relatively flat areas near water. The bison grazed wherever there was good food. The cattle disliked steep slopes.

"The range cattle didn't like to go up for water," said Van Vuren. "And they weren't anxious to climb up and eat that nice patch of grass on the hillside."

The OSU researcher said that while roaming over his four-square-mile research area (which varied from 9,000 to 11,000 feet in elevation) by truck, horseback and on foot, he had plenty of time to think. He decided the bison's almost uninterrupted development on the wild grasslands has given it a natural advantage over cattle, raised domestically for more than 5,000 years.

"Bison have to make a living in the Henry Mountains 12 months a year for the 20 or 30 years of their lives," he said. "They know instinctively they have to put on weight in the summer and go into the winter in top shape. They're always moving, always looking for the best food."

That means bison, already raised for meat production on a limited basis, might be able to thrive on rangeland unfit for cattle, he speculated.

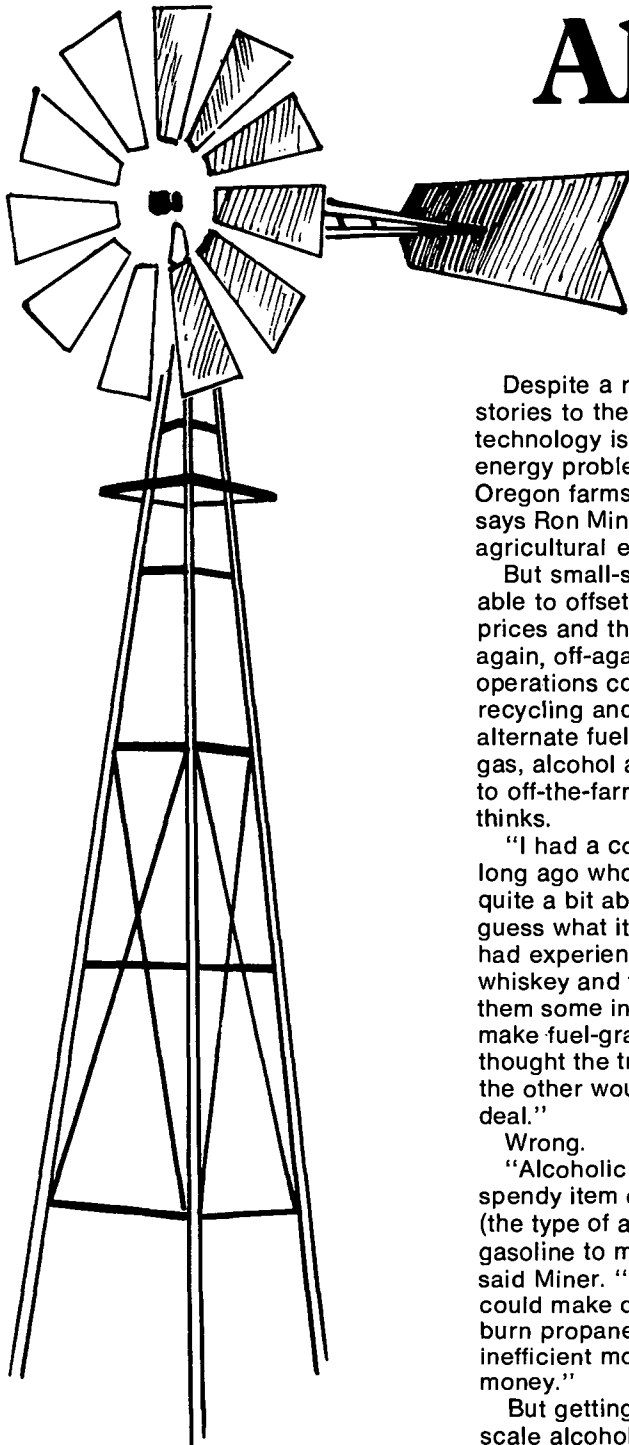


Van Vuren, who lived in a cabin high in the Henry Mountains during his wild buffalo study, says cattle have come to expect a free meal. Bison "know they have to make a living," he says.



**A combined system may
be the small-scale
farmer's best bet in the
quest for**

Alternate energy



Despite a rash of newspaper stories to the contrary, "moonshine" technology is not going to solve the energy problems of very many Oregon farms, especially small farms, says Ron Miner, the head of OSU's agricultural engineering department.

But small-scale farmers may be able to offset spiraling energy prices and the uncertainty of on-again, off-again supplies with operations combining conservation, recycling and the efficient use of alternate fuels (sunlight, methane gas, alcohol and so on) less subject to off-the-farm developments, Miner thinks.

"I had a couple in my office not long ago who thought they knew quite a bit about stills," he said. "I guess what it boils down to is they had experience making moonshine whiskey and they wanted me to give them some information on how to make fuel-grade alcohol. They thought the transition from one to the other wouldn't be all that big a deal."

Wrong.

"Alcoholic beverages are a pretty spendy item compared to ethanol (the type of alcohol added to gasoline to make "gasohol" fuel)," said Miner. "I imagine a person could make quite a few mistakes, burn propane and run a fairly inefficient moonshine still, and make money."

But getting more out of a small-scale alcohol fuel production system

than goes in is a formidable task requiring careful planning and follow-through, he said, adding that the couple's attitude underscores a general misconception about small-scale farming.

"I'm not sure I agree with the idea that the research has been done for small farm technology—that you can just go back to the 1920s literature and pull it off the shelf or set up crude moonshine systems for this and that," he said.

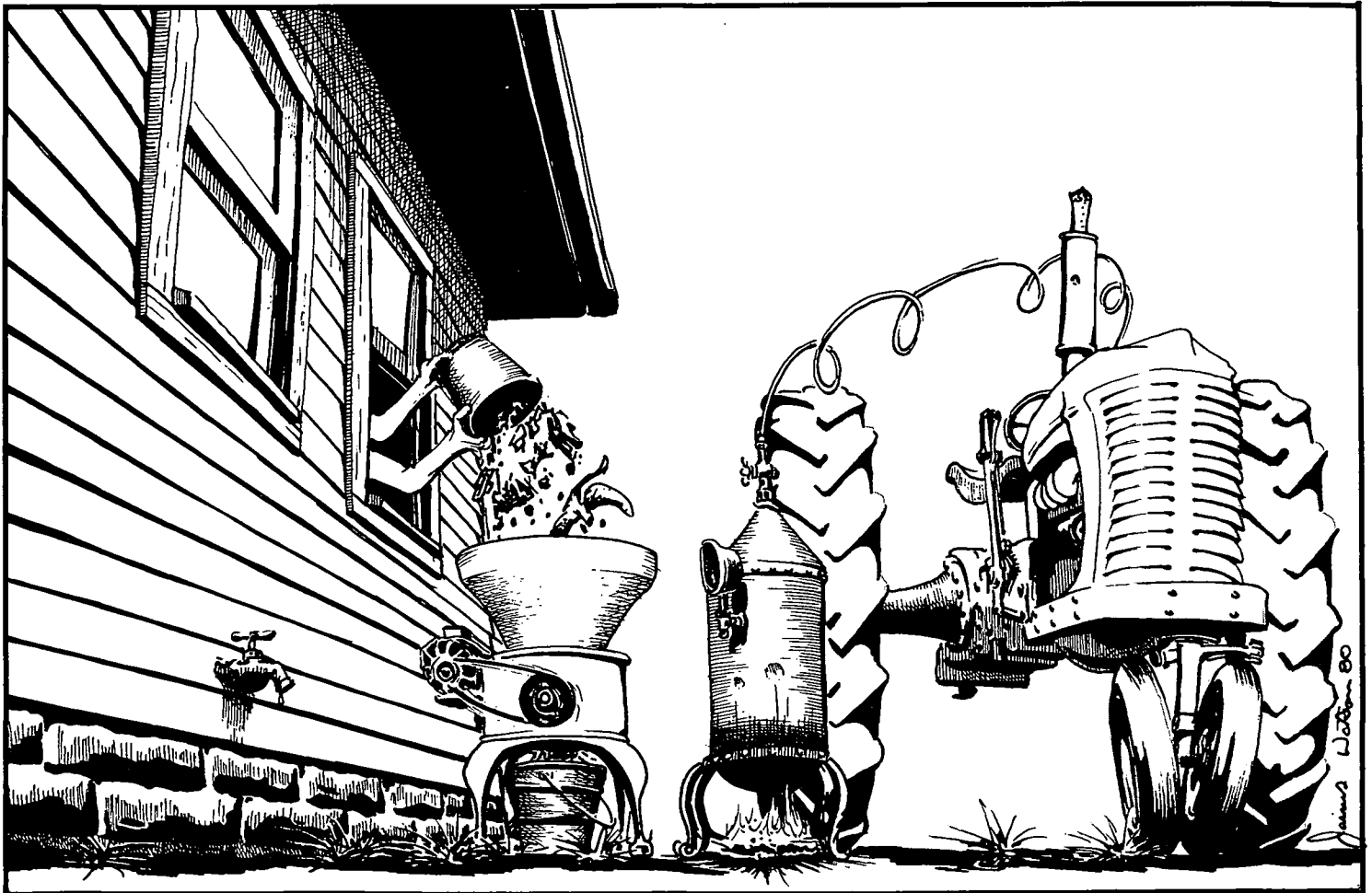
"Take alternate energy. It seems to me a system would have to be more efficient to work on a small scale. The technical demands may be greater for small farmers than for the large producers."

As for alcohol fuel, Miner said the person who markets an efficient but relatively inexpensive small-scale still—and many are working on doing just that—is going to do a brisk business.

Farmers in many parts of Oregon could use the still to produce fuel from materials such as waste fruit, potatoes and beets," he said, adding that he hopes research at OSU and elsewhere will identify commercially feasible methods of making alcohol fuel from other materials such as straw and wood.

A key to success, Miner thinks, would be the fuel providing heat to distill the alcohol (made from plants' sugar and starch).

"To my way of thinking, you would be in a much better position using an



alternate energy source at today's prices," he said. That might mean using solar energy or biomass fuel such as straw to heat the still, he added.

The idea fits Miner's general concept of how a small-scale farm can hold down energy costs.

"It is wise to look for ways to fit these alternate energy systems together," he said. "In combination they become more economically attractive."

Miner said OSU agricultural engineers are sizing up several sources and types of alternate energy besides alcohol fuel which could have small farm applications, including:

- Solar energy—In one project agricultural engineer Martin Hellickson is using solar panels to collect energy to heat water used to clean a dairy barn.

- Methane gas—"We have produced methane from swine wastes and know the technology," said Miner. "But at this point it takes the wastes from 100 pigs to produce the equivalent of two gallons of gasoline a day." He said OSU's "biological" generator, containing bacteria which also can convert household garbage and even human wastes into methane fuel, needs refining, especially to be efficient on a small scale.

- The "bale-burner"—This device, designed by recently retired agricultural engineer Glen Page, produces heat by burning bales of waste straw and might fill a link in an integrated energy system, perhaps by heating an alcohol fuel distillery, Miner said.

Recycling and conservation research is important, too, according to Miner.

He said projects with the goals of developing delivery systems for the reuse of animal and plant wastes as fertilizer, conserving water through more efficient irrigation and finding the "tradeoff" point in farm energy use could complement alternate energy research.

"We have always talked about the optimum environment for animals to do their best," said Miner. "Now maybe we need to find out how much heating or cooling can be cut to make the operation the most cost efficient. With fertilization and irrigation, we need to find out how far you can go with conservation."

"We don't have a lot of answers. But we are looking in some promising areas," he said. ■

A 'novel' strategy for small nurseries



Horticulturist Al Roberts inspects dwarf mugo pines.

Many small-scale farmers in Oregon's \$120 million a year ornamental crops industry could use a "novel" approach, says Al Roberts.

The OSU horticulture researcher likes to support his contention by citing the success of a Roseburg farmer who is "making a darned nice addition to his retirement income" growing Japanese maple trees on two acres of land.

Roberts' point is this: Novelty and specialty plants—green-flowered rhododendrons that bloom on St. Patrick's Day and bright redleaf forms of the Oregon vine maple and the like—are promising "meal tickets" for Oregonians trying to earn a living, or supplement their incomes, working relatively small plots of land.

"There's not too much you can do in agriculture anymore with 25 acres or less," said Roberts. "The nursery business may be one of the last areas open to the small operator.

"There is a demand for high-quality specialty plants," he added, "and many of the big nurseries don't want to fuss with them. They aren't set up for it. They'd rather subcontract them out to small producers."

The Experiment Station researcher explained that growing novelty and specialty plants (primarily new varieties of common ornamental plants developed to satisfy a seemingly unquenchable public thirst requires more "attention to detail" than many large nurseries are willing to give.

The reason for that, he said, is the techniques that must be used to produce and sell new plant varieties often do not mesh with present-day "assembly line" procedures in large

nurseries. The techniques make specialty and novelty crop production and marketing a "labor intensive" undertaking.

But those techniques often fit well with small acreage operations, Roberts said. Those operations usually are "long" on labor and "short" on the capital necessary to purchase expensive equipment and hold their own in the shortage-or-surplus world of mass-produced nursery plants.

And if plant collectors or landscapers want a plant a little different or better than ordinary, they usually are willing to pay more for it, he said. The higher price of novelty and specialty plants also makes growing them attractive for small-scale operators.

Bob Ticknor, a horticulturist at OSU's North Willamette Agricultural Experiment Station at Aurora, echoes Roberts' description of what strategy works for small-scale nurseries.

"You sit back and try to get the new releases (of plant varieties) as soon as they come out," said Ticknor, whose current research includes work on a late-blooming rhododendron (geared for the summer tourist season on the Oregon coast) and a type of green rhododendron that blooms around St. Patrick's Day.

"There are at least 2,000 rhododendron varieties," he said. "A few of the large nurseries may have 200 or 300. That leaves a lot of room for growing the uncommon varieties."

Where should a person start?

"Anything with a relatively high unit price that you can grow a lot of in a small area is a possibility," Ticknor said. "For example, many

miniature roses can be grown in the same area that one field-grown hybrid tea rose occupies. But the plants sell for about the same amount.”

Evergreens can be profitable, Roberts said.

In recent years he has selected six dwarf varieties of the Swiss mountain, or Mugo, pine tree from seedling populations and developed techniques for growing the small shrubs from stem cuttings so that each new plant is identical to its parent. The six slow-growing varieties, popular in landscaping, are of distinctly different sizes, shapes and shades. But what pleases many homeowners and professional landscapers most is their predictable growth.

“When a nurseryman starts a tree or shrub from seed, as is often done with some pine species,” said Roberts, “he doesn’t know if it’s going to be very vigorous or very dwarf. It’s hit or miss on size, color and everything else, and he sells it when it is still young so the buyer may wind up having to control the size by constantly pruning.”

Starting plants from cuttings also has the advantage for small-scale operators of being “labor intensive,” Roberts said.

“Cuttings require more attention to details because the techniques for some species are new and not fully developed,” he said, explaining that he expects more small-scale growers to become “specialist propagators” who start plants from cuttings, then sell them as “liners” (small plants) to large wholesale nurseries.

If small-scale farmers prefer, he said, they can sell their plants

directly to consumers by printing an inexpensive mail order catalog, by taking out advertisements in nursery industry magazines or by selling plants right at the growing site (if they are near urban areas or develop a good reputation with landscapers).

Making the small-scale operation pay off in the nursery industry, where 90 percent of the operations are relatively small but a few large operators produce 90 percent of the plants, is difficult but not impossible—especially with the novelty and specialty plant approach, said Roberts.

“The thing for the beginner to remember is to avoid trying to compete with the ‘biggs’ on their standard, bread and butter items,” he said. ■



A good strategy for small nurseries is to “sit back and try to get the new releases (of plant varieties),” advises Bob Tichnor of OSU’s North Willamette Agricultural Experiment Station at Aurora.

The small-scale farmer:



Avoiding the highly mechanized approach of much of agriculture, Polk County small-scale farmer Ivan Nisly uses Belgian draft horses to produce wheat, oats, clover, and other crops on his 65 acres (he keeps a tractor around to do certain chores). His 14-year-old son, Terry (above, left), says he would like to farm with horses someday.



For many folks, small-scale farming is not so much a way of doing business as a way of life; it is sort of a space-age revival of the fiercely independent spirit of the early American pioneers.

That is what John A. Young thinks after spending many hours peering into the world of some residents of Polk County, Oregon.

Young, an OSU anthropologist or specialist in the study of people and their cultures, went to Polk County, just east of Salem, in the summer of 1978 with graduate researcher Peter Caday.

The researchers' mission, part of a regional effort in five western states, was to assess the resources, needs and goals of persons operating small-scale farms.

After deciding not to study persons with relatively high nonfarm incomes (see related article, next page, for details), Young and Caday spent four days a week for three months crisscrossing Polk County's Coast Range hills and Willamette Valley flatlands collecting data and conducting in-depth interviews with 44 small-scale farmers they selected for scrutiny.

Yet, today, if he is pressed, Young moves past his pile of facts and figures and reaches for some impressions to explain who, and what, he believes those farmers are.

"The question of what is a small farmer has been kicked around a lot in Oregon and just about every state," he said. "I would define a

Why an anthropologist

Why would an anthropologist study farmers?

Timing, in the case of OSU's John Young.

Young happened to be on the staff of the Western Rural Development Center at OSU, a federally sponsored organization, when a plan for such a study surfaced.

"We had canvassed the 14 states we serve to find out what was of prime interest and five were very interested in the small farm issue," said Russell Youmans, director of the center.

Youmans asked Young, whose research skills fit, to conduct a study of small farmers in Oregon—to be combined with similar studies in the other four interested states when the center "weaved together a picture of small-scale farmers' needs (a process still taking place)."

The Oregon Agricultural Experiment Station contributed to the Oregon study by paying Young's salary during the project. ■

an American throwback?

small-scale farmer in Polk County not by any demographic attributes but by how he goes about it—his goals, his strategies.”

For example, Young said many people he interviewed probably would prefer to rebuild an older tractor and keep costs down rather than—as a more commercially oriented farmer might—going into debt to buy a “state of the art” tractor that might increase sales.

Given the limited resources of many small-scale farmers, and rapidly rising production costs, the strategy is understandable, he said.

“Money is important, of course,” said Young. “But most of those we interviewed were helping support themselves with outside jobs. They had \$10,000 or \$12,000 in outside

income. They farmed part-time for the way of life.

“Most of them aren’t the counterculture types people seem to think,” the anthropologist continued. “It’s more of a mainstream, All-American value system they have . . . a work ethic, a frontier ethic. Almost all of them grew up on a farm and value the independence—self-sufficiency—above all. Many of them went back to farming after a number of years in other occupations.”

In Young’s view, a lot of small-scale farmers are not “miniature” large-scale farmers.

“The conventional wisdom is that they have the same goals as large-scale farmers,” he said. “Many of them don’t, judging by our findings. Many of them want to farm full-time,

but not on a big, commercial scale. They just don’t have the old get-rich ethic.

“Most of them don’t want to borrow from the bank, lease more land and live on the brink of foreclosure,” he said. “They don’t see themselves as failures even if they are not quite breaking even. Their main goal is just to keep afloat, to keep farming . . . with enough food to eat.”

However, Young said one of four distinct types of small-scale farmers that emerged from an analysis of questionnaires the 44 farmers filled out was what he and Caday describe as the aspiring commercial farmer, a person close in some respects to having the characteristics of large-scale farmers. The other types were:

How the researchers picked their farmers

Their impact at the marketplace is limited. But sheer numbers make them a force to be reckoned with, the small-scale farmers.

That was one of the first discoveries OSU anthropologist John Young made when he set out with graduate researcher Peter Caday in 1978 to try and determine some of the needs of small-scale farmers by taking a close look at a group of them in Polk County.

A glance into the 1974 Oregon Census of Agriculture told Young that, although farmers who sell less than \$40,000 worth of agricultural products a year account for only 15 percent of Oregon’s gross farm product sales, they represent 80 percent (almost 21,500) of the state’s 26,753 farmers.

In Polk County, selected for study partially because of a program for small-scale farmers already underway under the direction of Extension agent John Burt, not sheer numbers but the diversity of small-scale farmers challenged Young and Caday.

“There are wealthy doctors and lawyers and others who have a few

cattle or farm small acreages,” said Young. “And they certainly are doing small-scale farming. But we finally decided to eliminate people farming more as a hobby.”

Their reasoning, Young said, was that persons with relatively high nonfarm incomes would not be as likely to suffer acute financial difficulties brought on by farm problems.

The researchers limited their study to persons whose gross farm product sales were less than \$40,000 a year and whose outside income was less than \$20,000 a year (based on 1977 figures). They also selected for study only persons who lived on their farm and who had been farming at least a year.

“The average gross sales of the 44 people we studied turned out to be about \$8,000 a year,” Young said, explaining that his subjects had nonfarm occupations ranging from mechanic to mill worker, school teacher and computer programmer.

The value of what the 44 people and their families produce on their farms is not completely registered at the marketplace, he said, because many of their products are consumed at home or traded to friends and neighbors. ■



“I grew up on a dairy farm and having a stock ranch was a kind of a lifelong ambition,” says Jim Evans, who left a construction job and house in Portland four years ago to buy a small farm (90 acres) in Polk County. Now he raises cattle, and hay to feed them, and works part-time as a carpenter. “It’s a good, clean way to live,” says Evans.

- Part-time farm operators with relatively low time commitments to farm work who relied heavily on nonfarm income.
- Alternative agriculturists whose production and marketing strategies differed from conventional patterns (all organic farming, for example).
- Retirees and older persons restricted in their capacity to farm commercially and to support themselves by working off the farm.

How did the 44 small-scale farmers see their future?

Young said about three-fourths thought opportunities for the small-scale farmer would decrease. They cited obstacles such as an intrusion on their land base caused by zoning laws and rising property taxes; low and widely fluctuating agricultural prices; problems with weeds and pests; unforeseen injuries or health problems; and public agencies they think are “at cross-purposes or over-regulating” small-scale farmers.

Young and Caday suggested in a report on their study that assistance programs for small-scale farmers include goals such as re-examining zoning ordinances; developing low-cost technology and farming methods such as alternate energy sources, local irrigation projects and biological pest control methods; and identifying “labor intensive,” high quality products the small-scale farmer could produce and additional direct marketing channels they could use to sell their products.

Can an anthropologist such as Young draw any broad cultural conclusions from the Polk County study?

“We don’t have any statistical basis for generalizing about the state as a whole,” he said. “But comparable studies in four western states have found similar themes—the interest of small-scale farmers in self-sufficiency and the security of the land—running through them.”

“A researcher found one farm in Hawaii worth about \$10 million at current real estate prices,” he said. “But the owner was grossing only about \$5,000 a year from his operation. That farmer could be sitting on easy street if he sold, but he liked the lifestyle and the security of the farm.” ■



Jim Evans and his wife Janet (above), who works part-time for a state agency in Salem, like the idea of raising their 14-year-old son, Jimmy (below with his dad), and 11-year-old daughter, Traci, on a farm. Everyone pitches in to do the work, say the Evans.



DRYING FOOD

**Like freezing and canning, it can save you money.
But there are tradeoffs.**

When preserving food, if you are concerned only about how good it is for you, freeze it, can it or eat it fresh.

That is the advice of two OSU researchers who studied how drying affects certain nutrients in some fruits and vegetables.

But that is not to say drying the fruits and vegetables—raspberries, boysenberries, green beans, zucchini squash and tomatoes—at home, a practice regaining popularity in Oregon partially because of the rising price of canning containers, lids and sugar and the increasing number of home gardeners, is the wrong thing to do.

“We aren’t drawing any general conclusions. We just looked at a few foods and a few of their nutrients prepared in one food dryer,” said OSU foods and nutrition professor Zoe Ann Holmes, who conducted the study with professor Lorraine Miller, a nutritionist. “Besides, drying fruits and vegetables gives you another alternative to some less healthy snack foods.”

In the study, which Holmes describes as a “very small step” toward determining the nutritional value of dried fruits and vegetables, the researchers measured the percentage of certain nutrients (see related article for more information) lost when the foods were prepared in a typical electrical food dryer.

In most cases, nutrient losses were great. But in one the drying process actually put a nutrient in a form the human body could use more readily. Some of the findings:

- Losses of vitamin C were the greatest. The amounts left after drying ranged from only 2 percent in green beans to 74 percent in raspberries.

- A higher percentage of vitamin B6 than vitamin C was retained in all the foods (60 to 90 percent).

- In tomatoes and zucchini squash, the nutrient folacin was converted to

a form the body could use more readily.

- Almost all the carotene in green beans and tomato puree, the only foods tested for that nutrient, was lost during drying.

Miller said in most cases freezing or canning the fruits and vegetables would have preserved a higher percentage of the nutrients.

“But that isn’t important in many situations,” she said. “Some of these foods aren’t eaten for vitamin C, for example. And when they are, say in the case of berries, even though more vitamin C is lost in drying, the fruit leather concentrates the nutrient.”

She said because canning is becoming more expensive, and Oregonian’s freezers fill up quickly in the summer and fall, drying foods is an attractive way of adding variety to the diet.

“You’re getting fiber and some variety if nothing else with a dried

product,” added Holmes. “That we know. What needs to be done now is a comprehensive study of various fruits and vegetables—dried by consumers in their own devices—to determine their nutritional value.” ■

Vitamin guide

Here is a simplified description of some ways the human body uses the nutrients the OSU researchers studied.

- Folacin—Assists in forming red blood cells.
- Carotene (converted to vitamin A in the body)—Used in maintenance of the skin and vision.
- Vitamin C—Used in forming the “cement” holding cells together.
- Vitamin B6—Helps in the breakdown and utilization of proteins and some carbohydrates.



Researchers Zoe Ann Holmes and Lorraine Miller arrange a sample on a food dryer similar to the one used in their nutrition study.

Betting on bovines

How to boost cow-calf profits

Knowing just "when to hold 'em and when to fold 'em" is an ace in the hand of an Eastern Oregon rancher, two OSU researchers report.

They say ranchers may be able to increase profits from their cow-calf operations dramatically by keeping calves longer when prices are rising and selling them quickly when prices are going down.

"We found that, over an 11-year period, keeping yearlings (calves in their second year) through the summer and selling in August increased the net farm income for a 300-head herd by 79 percent, from \$218,292 to \$391,646," said Carol Whitley, who conducted a study of Eastern Oregon cow-calf production for her master's thesis in agricultural economics under the direction of Experiment Station agricultural economist Carl W. O'Connor.

The key to the strategy for increasing profits, said O'Connor, is paying close attention to the weight-times-price formula used to calculate a calf's value and to partially predictable fluctuations in the cyclic cattle business.

He said during periods when supplies at the marketplace are dwindling, and prices are rising, it becomes profitable to hold yearlings and fatten them on summer pastures (rather than selling them in the spring as some ranchers do).

When supplies increase, and prices are decreasing, ranchers can minimize their losses by switching production systems and selling calves when they are weaned in September (at about four to six months of age).

Whitley came up with economic projections in the study by using data collected at the Squaw Butte branch of the Eastern Oregon Agricultural Research Center near Burns to develop a computer program. The program simulated the goings-on, and the grain, pasture, water and other resources, at a "typical" Eastern Oregon cow-calf production ranch.

The researcher examined the operation of the theoretical ranch during an 11-year period from 1968 through 1978, she said, because it

represented a "fairly common" cattle cycle.

Generally, Whitley said, ranchers spend the first six or seven years of a cycle expanding their herds and the next three or four cutting them.

The cycles begin, she explained, when calf prices rise high enough—for a variety of reasons, which could include consumer preferences and the general state of the economy—so that it becomes attractive for ranchers to withhold heifers from the slaughter market and build up their herds.

As the herds grow, the cost of maintaining them escalates and so does the supply of beef until cattle prices gradually begin to fall. Producers then begin selling more calves and prices continue to dip until supply again equals demand.

Within that type of longterm cycle, producers must decide just how long to hold the calves (born in late winter) they are going to sell, Whitley explained. She said they usually choose one of three production systems:

- The cow-calf system, where calves are sold at weaning time in September.

- The cow-yearling system, where calves are held through the next winter and sold in the spring of their second year.

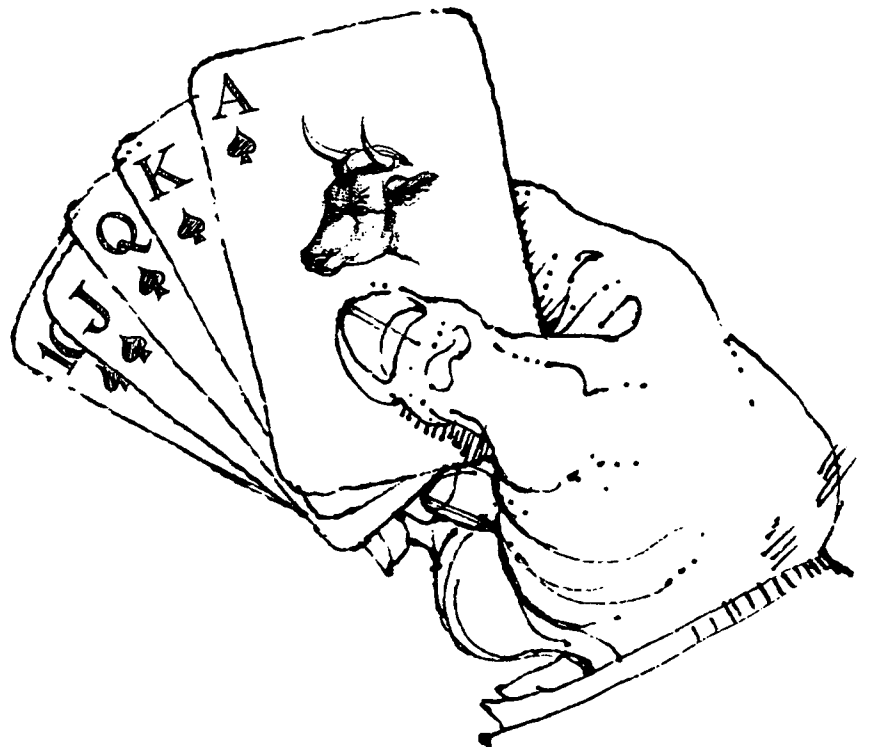
- The cow-long yearling system, where calves are kept through their second summer and sold in August.

Whitley said in her computer study the producer had to shift between the cow-calf and cow-long yearling system several times because influences such as then-President Nixon's 1974-75 price controls altered the cycle.

She and O'Connor said about half the producers in Eastern Oregon now use the cow-calf production system and the other half use either the cow-yearling or the cow-long yearling system.

"We hope operators will look at our method and ask themselves if they are making the best economic use of their resources," O'Connor said. "We are not saying everyone should change their operation. We just want to make them aware of the possibility."

"Of course," Whitley added, "some producers already fit their system to the market. But others probably don't even think about it. They just do it the way 'Grandpa' did." ■





Bee researcher
Michael Burgett

Why bees swarm the lemon balm

In 1629, Sir John Parkinson, an English herbalist, recommended using the lemon balm plant to attract bee swarms.

Today—more than 350 years later—Michael Burgett, OSU assistant professor of entomology, is studying the scientific basis of the practice.

“The success of attracting swarms with this method is unknown but several chemicals found in lemon balm are similar to compounds produced by bees,” said Burgett. “These compounds, known as pheromones, are chemical messengers in the complex communication system of bees.

“One pheromone in particular, the Nassenoff gland secretion, contains the chemicals neral and gernaial, which also are found in lemon balm,” said Burgett. “These chemicals are responsible for the characteristic lemon scent associated with lemon balm.”

The Nassenoff gland secretion has several important functions in bee communication: conveying food information, relaying news of errant queen bees during swarming and locating new nest sites, the scientist said.

“However, a synthetic mixture of the pheromone is actually more effective in influencing bee activity than lemon balm,” said Burgett.

But the popular garden herb is still valued by some.

While collecting nectar for honey, the bees also pollinate the tiny lemon balm flowers. This helps commercial producers of lemon balm in the Mediterranean region of Europe where the herb is distilled for essential oils, an important ingredient in the perfume industry. ■

Nutritionists compare fresh, processed food

Are fresh or processed foods a better source of selenium, the trace element especially scarce in the soils of Oregon?

OSU researchers are trying to find out.

“What we want to know,” said Jim Leklem, a nutrition researcher directing the project, “is if food processing makes nutrients such as selenium and vitamin B6 more or less usable.”

He said researchers have found that processing can “tie up” nutrients in some foods. In other foods, canning and other forms of processing make nutrients readily available.

Leklem and Experiment Station researchers Lorraine Miller, Phil Whanger and Jane Wyatt are studying the effect of processing on bread, canned tuna, peaches and carrots, canned and frozen green beans and corn, frozen broccoli and cauliflower, french fried potatoes and peanut butter.

Leklem said nutritionists know less about the effect of processing on vitamin B6 and selenium than on many food nutrients. One part of the three-year OSU study, still in its early stages, includes feeding special diets to human volunteers and rats to try and determine how the body reacts to vitamin B6 and selenium.

Some researchers think a lack of selenium may be related to human disorders. However, others have speculated that, even though selenium is scarce in Oregon, most Oregonians have a normal intake of the substance because they eat food grown outside the state. ■



The artichoke makes a stand in chill Oregon

California's delicious thistlelike vegetable, the artichoke, may find a home in chillier Oregon.

On the central coast of California, where most U.S. artichokes are grown, the plant is propagated from root sections or shoots from adult plants (to assure almost identical size and shape) and thrives in the cool summers and frost-free winters.

Now two OSU horticulture researchers, James Baggett and Harry Mack, are experimenting with growing artichokes from seed in Oregon (on an annual basis) to avoid the winter plant losses that might occur here.

Baggett said he and Mack's trials include raising seedlings in a greenhouse and transplanting them in a field.

"In our first crop in 1978, the first year of the project, most of them produced," said Baggett. "But we planted them rather late in the season and apparently did not fertilize and irrigate enough."

He said 1979 plantings produced earlier and better artichokes and additional trials are planned this year.

The artichokes were grown in an open field in full sun, watered once a week and fertilized with nitrogen, said Baggett, adding that he and Mack think more experimentation is needed and are not ready to recommend the artichoke for commercial production in Oregon.

Consumers want the size and shape uniformity of artichokes propagated as they are in California, said the researchers.

"However, seedling artichokes should be quite acceptable in the home garden," Baggett said. "The quality is okay and the home gardener usually is not fussy about uniformity and size."

The edible part of an artichoke is the immature flower bud, a compact cluster of scales, and the base or heart to which the scales are attached. ■

Emus eat too much

After their hatching and a whirlwind three weeks in February when their ostrichlike bodies outgrew their long, skinny legs, Alpha and Beta—the emu chicks—died.

But not before OSU researchers had added a few observations to their growing knowledge of the exotic birds, native to Australia, New Zealand and nearby islands.

Poultry science professor James Harper, who directed the incubation of four emu eggs (two hatched, two did not) obtained from Wildlife Safari, Inc., a Winston, Oregon, wild animal farm, theorized it was the birds' tremendous appetites that did them in.

"We really didn't know how to handle them, so we allowed free, 24-hour access to food and light," Harper said. "Toward the end, one of the birds was gaining almost half a pound a day."

He said the young emus simply could not cope with the weight strain

on their legs, resulting in spraddling, an affliction common among young chickens and turkeys.

The Experiment Station scientist since has learned that the male emu, which incubates eggs under natural conditions, keeps just-hatched chicks underneath him for five or six days, giving them limited access to food and exercising their legs with a "pumping motion."

Harper said the Winston firm plans to send additional eggs to OSU and his strategy next time will include restricting the chicks' diets and devising a shelter to keep them off their legs most of the time the week after hatching.

Oregon's wet winters apparently cause problems for male emus attempting to incubate chicks, he said.

OSU is assisting Wildlife Safari biologists, who have had difficulty hatching emu eggs, because of the opportunity to "gain new information and experience" that might come in handy in other research, Harper noted. ■

A tail of woe for range cows

In the blustery Eastern Oregon winter, a range cow literally can freeze its tail off.

That is one reason . . . not to mention possible weight loss, and even death . . . Experiment Station researchers are using a computer, weather data and some Yankee ingenuity to try and make cattle a bit more snug.

A device being studied by Ralph Phillips, animal nutritionist at the Union branch of the Eastern Oregon Agricultural Research Center, and Earl Bates, campus agricultural meteorologist, is a solid windscreen they say can cut wind velocity more effectively than the typical porous screens commonly used for purposes unrelated to cattle protection, such as to curb erosion and collect snow to add moisture to agricultural land.

Phillips and Bates said a prototype windscreen at the Union station, made of inexpensive plywood, cuts the wind by as much as 90 percent in part of the protected area and by 50 percent over a considerably larger area.

"Believe me, it's not a problem getting cattle to use them when the chill factor gets down there," said



Phillips, noting that last winter the "manure pattern" behind the prototype matched a description of the protected area.

Phillips said the most obvious payoff for windscreens would be in saving newborn calves, which can die in a few hours when the chill factor drops far below zero.

Pregnant cows prefer to get off by themselves, he said, and he envisions a system with large barriers for herds and a few small, possibly mobile, screens for cows giving birth.

Phillips and Bates are collecting and analyzing winter weather data with the goals of determining average wind chill factors for various winter periods and developing a method of checking wind and

temperature early in the morning and predicting—and making available to cattlemen—the chill factor for the rest of the day.

According to the researchers, scientists disagree on how much stress cold weather places on cattle. Some believe moderately low chill factors—say zero to minus 30 degrees Fahrenheit—can cause hard-to-recover weight losses. Others do not.

Phillips said chill factors in the minus 30 to 70 degree range can freeze a cow's flesh (the tail, for example) and cause pneumonia and other diseases.

Bates said he hopes future research will include cold weather feeding experiments behind solid windscreens. ■

Light turns on rabbit romance

Turning the lights on turns the rabbits on.

That is the finding at OSU's Rabbit Research Center.

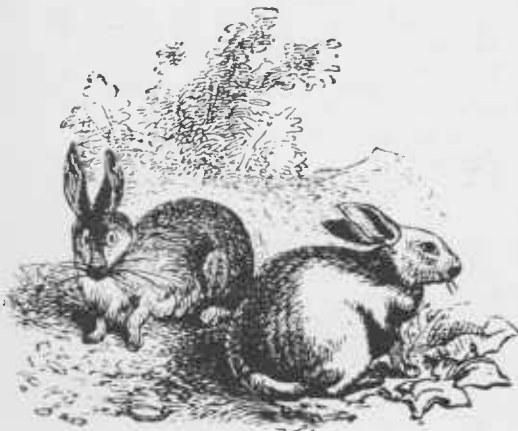
"Light is very important in keeping rabbit reproduction at a continuing high level through the winter," said Nephi M. Patton, center director.

Patton, who noted that rabbit production generally goes down in the winter because the animals do not breed as well and because of increased disease problems, said OSU studies in which lights were kept on 16 hours a day helped overcome the animals' winter "breeding depression."

Just the same, romance may play a declining role in rabbit production, the scientist said, because of the growing popularity of artificial insemination in large-scale rabbit production (primarily in Europe).

As for other winter-oriented study, OSU researchers have found keeping rabbits dry is more important than keeping them warm.

"Rabbits can get along in chilly weather though they respond better to temperatures in the 50- to 60-degree Fahrenheit range, of course," said Patton. "But energy costs are simply too high to make continuous heating practical in most cases." ■



1979 PUBLICATIONS INDEX

Oregon Agricultural Experiment Station scientists conduct a lot more research than *Oregon's Agricultural Progress* has the space to report. Most readers know that. But some of you may not know of other Experiment Station publications about research which are available to Oregonians. The scientists themselves write reports—called Circulars of Information, Station Bulletins and Special Reports—about their research findings. Also, the scientists have reprints of articles they write for scientific journals. Usually, single copies of the circulars, bulletins, reports and journal reprints are available free to Oregon residents.

Following is an index of most of the 1979 publications. They are categorized by departments of the OSU School of Agriculture. Copies of Circulars of Information and Station Bulletins may be obtained by contacting the OSU Bulletin Mailing Service (Industrial Building, OSU, Corvallis 97331). Copies of Special Reports and journal reprints (called Technical Papers) may be obtained by contacting the scientists who wrote them through the campus departments they are listed under. When requesting a publication, refer to the number in the index.

Circulars of Information

Agriculture and Resource Economics Department

- CI 675 An Evaluation of Expected Private Losses from Selected Public Policies for Reducing Open Field Burning, Willamette Valley, Oregon
- CI 676 Who Owns Rural Land in Oregon—Reprint

- CI 679 The Economics of Producing and Marketing Soybeans in Oregon

Animal Science Department—Rangeland Resources Program

- CI 680 Response of Bluebunch Wheatgrass to Drought and Climatic Fluctuations: A Review

Crop Science Department and Klamath Experiment Station

- CI 678 Oregon Potato Variety Trials 1978

North Willamette Experiment Station—Aurora

- CI 677 Establishment and Management of 'Boysenberries' in Western Oregon

Station Bulletins

Eastern Oregon Agricultural Research Center—Burns, Squaw Butte Station

- SB 635 Irrigated Pastures for Range Livestock

- SB 640 A Bibliography of Bitterbrush

Entomology Department

- SB 634 Integrated Pest Management of Insects and Mites Attacking Pears in Southern Oregon

- SB 636 A Natural Light Sapyga Parasite Emergence Trap in Leafcutting Bee Management (Megachile rotundata)

- SB 637 Field Domiciles and Incubators for the Leafcutting Bee—Their Form and Function in Management

Special Reports

Agricultural and Resource Economics Department

- SR 546 The Constancy of the U.S. Wheat Acreage Supply Elasticity

- SR 552 The Economics of Milk Production in Selected Pacific Northwest Milksheds

- SR 553 Agriculture: It's Importance to Oregon's Economy

- SR 556 Estimated Costs and Returns from Mechanical Strawberry Harvest in Oregon: A Progress Report

- SR 560 An Economic Analysis of Land Prices of Mountainous Grazing Land in Eastern Oregon

- SR 565 An Examination of Dynamic Relationships—and the Lack Thereof—Among U.S. Lumber Prices, U.S. Housing Starts, U.S. Log Exports to Japan, and Japanese Housing Starts

Animal Science Department

- SR 526 Effect of a New Antibiotic (MK747) on Feedlot Performance of Yearling Steers

- SR 539 Summary of Reports . . . 1979 Sheep and Wool Days

- SR 542 Beef Improvement Day Report 1979

- SR 564 Reports of the 21st Annual Swine Day

- SR 562 Cheatgrass and Its Relationship to Climate: A Review

Central Oregon Experiment Station—Redmond

- SR 538 Cereals for Hay in Central Oregon

Columbia Basin Agricultural Research Center—Pendleton

- SR 533 Harney County Spring Cereal Yield and Observation Trials

- SR 547 1979 Research Reports—Columbia Basin Agricultural Research Report

Crop Science Department

- SR 536 Results of the Fifth International Winter X Spring Wheat Screening Nursery (1977-1978)

Eastern Oregon Agricultural Research Center—Burns, Squaw Butte Station

- SR 530 Climate and Agriculture of Malheur-Harney Basin, Oregon

- SR 531 Alfalfa for Hay and Pasture in Southeastern Oregon

- SR 532 Management Alternatives for Native Meadowlands

- SR 534 1979 Progress Report . . . Research in Beef Cattle Nutrition and Management

- SR 537 Temperature-Precipitation Considerations in Eastern Oregon

- SR 549 1979 Progress Report . . . Research in Rangeland Management

Malheur Experiment Station—Ontario

- SR 554 Crop Research in Oregon's Treasure Valley 1979

Mid-Columbia Experiment Station—Hood River

- SR 545 Postharvest Decay Control of Apples and Pears After Immersion Dumping

- SR 550 Commercial Handling and Storage Practices for Winter Pears

North Willamette Experiment Station—Aurora

- SR 541 North Willamette Agricultural Experiment Station Vegetable Research—1978

North Willamette Experiment Station—Aurora

- SR 557 Caneberries: A Summary of Research Progress, 1979

- SR 563 Strawberries Mechanization—An Evaluation of Harvesting, Processing, Utilization, and Economics

Poultry Science Department

- SR 559 Comparison of the Performance of Dwarf, Intermediate, and Normal Body Size Single-Comb White Leghorns Housed in Conventional Single-Cage Houses

● SR 566 Performance of Single-Comb White Leghorn Layers in Three Types of Houses in Oregon

Soil Science Department

● SR 543 Methods to Recover Nutrients and Energy from Swine Manure

Technical Paper Reprints

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Happiness beyond 'them old hills'

He arrived in Oregon in 1949 in the back of a half-ton pickup truck with 25 of his fellow Arkansans. They had come to work the green pea harvest in the Pendleton area.

"I was like a lot of young bucks after the war who wanted to see what was over the next hill," says Roy Fancher.

Eventually, his traveling companions left. But waiting in the future for Fancher, whose quick smile and southern ways today are as familiar to many OSU students and professors as the distinctive aroma in his office, were a wife, three children and a career as herdsman—day-to-day manager—of the OSU Swine Center (the home of about 850 pigs used for research and training).

"I don't suppose I grew up wanting to work with pigs," he says recalling boyhood days on a 400-acre farm near the tiny town of Kingston, Arkansas, in the Ozark Mountains. "I suppose I felt like most farm kids. Taking care of the hogs was just another undesirable chore.

"But when I think back over the years . . . I guess I learned a lot. My dad was an animal trader. When I tell

people how we used to drive cows and pigs 30 or 40 miles down the middle of the road I wonder if they believe me."

After he came to Oregon (he was 22 and fresh out of a job as cook with an armored unit in the Army's occupation forces in Europe), and married his now-wife of 30 years, Fancher worked at several jobs in the Pendleton area—including farming and operating heavy equipment—before moving to OSU in 1961.

"I enjoyed it right from the start," he says of being swine herdsman ("biological technician they call it now," he says, chuckling). "I liked working with the animals and I enjoyed the kids, the students. Still do. I guess I'm sort of a father figure. They tell me their tales of woe."

Apparently, students have enjoyed working with Fancher. He gets letters and visits from OSU graduates, some former assistants, now in a variety of jobs, including one who is vice-president of a national food corporation.

His boss likes him, too.

"Perhaps the thing that has pleased me most about Roy," says OSU animal science professor David England, who hired Fancher in 1961 and has been his supervisor since, "is the way he has earned the respect of students, the faculty and livestock producers. He likes people and he is honest with them. And he's got a lot upstairs."

Fancher's friendly ways also charm groups of school children and other frequent visitors to the center. But it is not uncommon for them to wrinkle their noses at the odor, and that bothers him a little.

"Pigs have a bad image," he said. "I won't deny they throw off an odor. But I like to ask people what they think it would be like if 800 humans lived in the same closed area."

Does Roy Fancher have any regrets about his career?

"I guess a guy always leaves a part of himself in them old hills (the Ozarks)," he says. "But if I had to give a concrete answer on what I'd do with my life . . . I'd do just about what I'm doing now." ■



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