

Oregon Agricultural Commodities



2005 Farmgate Values
and First Handler Value Added

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Prepared by

Larry Burt
Extension economist
Agricultural and Resource Economics
Oregon State University

Linda J. Brewer
Extension senior faculty research assistant
Horticulture
Oregon State University

Special reviewer

Jim Cornelius
former Extension economist
Oregon State University

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Introduction

The OSU Extension Economic Information Office annually compiles estimates of crop and livestock production and farmgate values¹ in all 36 counties. About 70 OSU Extension and research faculty provide the estimates, based on personal knowledge, contact with industry leaders, various published and unpublished data, and, in some cases, surveys. Depending on the year, the office tracks about 130 commercial agricultural commodities plus many more miscellaneous commodities. Some are produced in only one county; others are produced in most or all counties.

From time to time, the OSU Extension Economic Information Office estimates the values added to farmgate values as agricultural commodities move through the first-handler level. Estimates are based on the best judgments of acknowledged industry leaders and commodity specialists within OSU Extension and research faculty. Value added typically has four components:

- Labor
- Processing and packing
- Transportation and handling, and
- Other, including office expenses, marketing, utilities, government fees and taxes, management charges, and general overhead expenses

Total farmgate value plus total value added by first handlers equals the total value after first-handler inputs and, if appropriate, after delivery to such second handlers as wholesalers or retailers. All other values added in wholesaling and retailing are excluded from our estimates. Also excluded is any value added once the product is exported out of Oregon.²

How estimates were computed

Cost information frequently was provided in the context of mark-ups or margins. Included in the cost information were expenses for payroll, processing, packaging, handling, transportation, and storage as well as for other items. Value-added information from the survey sample was applied to preliminary 2005 total crop and livestock farmgate sales production estimates in order to generate aggregate first-handler value-added estimates for Oregon's agricultural sector.

¹*Farmgate value* refers to farm and ranch receipts for the sale of agricultural commodities at their places of production. No handling, processing, or other marketing charges are included in farmgate value estimates, unless they are included as the usual and customary practice. From these receipts, producers pay all their operating expenses including operator and hired labor, machinery and equipment charges, other production input expenses, management charges, overhead, family living expenses, and all other expenses associated with the production of an agricultural commodity.

² The definition of *value added* in this publication is in contrast to the definition for *net value added* used by the U.S. Department of Agriculture's Economic Research Service. *Net value added* represents the total value of the farm sector's production of goods and services, less payments to other (nonfarm) sectors of the economy. It reflects production agriculture's addition to the gross domestic product. It also represents the sum of the economic returns to all providers of factors of production: farm employees, lenders, landlords, and farm operators (see http://www.ers.usda.gov/Briefing/FarmIncome/Glossary/def_va.htm).



In some agricultural industries, or even in whole sectors, the division between commodity producers and first handlers is quite clear: two businesses are involved. However, in others, producers may

provide first-handler services. In preparing these estimates, we asked industry experts to help separate functions so that first-handler estimates included only costs associated with marketing activities commonly considered past the commodity farm-gate level.

Our informants further provided us with insights and observations on the current situation and near-term outlook for these commodities. These follow the value-added information in the discussions below.

Proprietary information

All projects conducted by OSU Extension Economic Information Office adhere to the USDA National Agricultural Statistics Service rules regard-

ing proprietary information. Financial data are treated as confidential whenever fewer than three growers or processors handle a single commodity. Likewise, data are treated as confidential whenever a single grower or processor handles 60 percent or more of a commodity. These data are reported in the estimates, but they are grouped with other commodities. Summary numbers in this publication conceal proprietary information obtained from industry leaders and observers.

Unique paths from field to fork

More “total” value is added to these commodities than that by the first handlers, but each commodity follows its own unique path from field to fork. Depending on the commodity, a grower may receive at farmgate as much as 50 percent of the value after delivery to first handler.

Fruits and vegetables generally are processed within Oregon, contributing significantly to the value added reported in this publication. On the other hand, sugarbeets and meat animals largely are exported out of state prior to processing—and the value added accrues elsewhere. Some commodities, such as nursery crops, leave the farm in nearly consumer-ready condition and, thus, little value is added to farmgate values.

Consider the different paths for wheat and snap beans. The first handler for wheat is the grain elevator, which pays the producer about \$3.80/bushel. The elevator may clean the grain and then sells, loads, and ships it to buyers. Handlers after the elevator add the vast portion of value to the wheat in a \$2.50 loaf of bread. The grower receiving \$3.80 per bushel contributes only about \$0.075 to the loaf’s cost. By contrast, snap beans go from grower to processing plant, where they are washed, trimmed, frozen, packed, and stored until shipment. At most, there is one more handler before the beans appear in the grocery store.

Results

Crops accounted for 71.7 percent and livestock 28.3 percent of 2005 farmgate value. Overall, Oregon’s farmgate sales grew by almost \$750 million, or 23.6 percent, between 2002 and 2005. Only one of twelve agricultural sectors, field crops, experienced a decrease in farmgate values, and that was a decrease of 4 percent between 2004 and 2005.

Oregon producers received nearly \$4.1 billion from sales of crops and livestock in 2005, according to our preliminary estimate. Total statewide value added by first handlers is estimated at just over \$2.1 billion, or about 53 percent of farmgate sales value (Table 1 and Figure 1, page 3).

Agricultural sectors varied widely in percentage of value added in Oregon. The fruit and nut sector led the way at about 123 percent in value added to farmgate sales. The meat sector ranked 12th, the lowest of all the sectors, at just over 8 percent. The differences reflect a relatively large number of in-state first handlers for many berries, tree fruit, and nuts compared to relatively few for cattle, sheep, and hogs. It is important to note, when considering relative values added, that a capital-intensive postfarmgate process has a higher cost than a labor- or transportation-intensive process.

The vegetables sector ranks highest in value-added dollars, at \$696 million, reflecting significant processing and packaging in-state. Miscellaneous livestock had relatively little value added in state; most of that was related to selling, handling, and transportation services (Figure 2, page 4).

Of the \$2.1 billion estimated value added in 2005, just over one-third related to labor inputs, one-sixth related to packaging and similar inputs, and about half comprised a wide variety of other inputs (Table 2, page 4, and Table 3, page 5).

Frozen food manufacturing, dairy, fruit and vegetable canning and drying, baked goods, pasta and tortilla manufacturing, and meat processing made up approximately 60 percent of the **wholesale value** of processed agricultural commodities in Oregon. Five sectors made up just over 60 percent of all **jobs** in agricultural processing: frozen food manufacturing, baked goods, pasta and tortilla manufacturing, fruit and vegetable canning and drying, dairy, and meat processing.³

³ Sorte, B., and B. Weber. *Agriculture and the Oregon Economy*, SR 1014 (revision forthcoming). Oregon State University Extension Service, Corvallis, OR.

Table 1.—Leading Oregon agricultural commodity sectors in terms of value added (2005).

| Commodity | Rank by % value added | Farmgate total (\$000) | Value added by first handler | | Total after first handler |
|----------------------------|-----------------------|------------------------|------------------------------|---------------|---------------------------|
| | | | (\$000) | % of farmgate | |
| Statewide total 2005 | — | 4,066,320 | 2,144,611 | 52.7 | 6,210,931 |
| Vegetables | 1 | 377,945 | 695,988 | 184.2 | 1,073,933 |
| Poultry & eggs | 2 | 97,527 | 134,747 | 138.2 | 232,274 |
| Fruit & nuts | 3 | 343,490 | 419,723 | 122.2 | 763,213 |
| Dairy | 4 | 340,062 | 295,567 | 86.9 | 635,629 |
| Other enterprises* | 5 | 298,403 | 160,877 | 53.9 | 459,280 |
| Forage | 6 | 258,201 | 93,394 | 36.2 | 351,595 |
| Grains | 7 | 198,640 | 40,886 | 20.6 | 239,526 |
| Seed crops | 8 | 373,490 | 76,012 | 20.4 | 449,502 |
| Field crops | 9 | 86,804 | 16,092 | 18.5 | 102,896 |
| Ornamental crops | 10 | 979,943 | 153,131 | 15.6 | 1,133,074 |
| Livestock, miscellaneous** | 11 | 55,220 | 4,782 | 8.7 | 60,002 |
| Meat | 12 | 656,595 | 53,412 | 8.1 | 710,007 |

* Principally log and firewood production from nonindustrial private forest lands.

** Includes mink, horses, llamas, and alpacas.

Figure 1.—Total farmgate values for Oregon agricultural commodity sectors (2005).

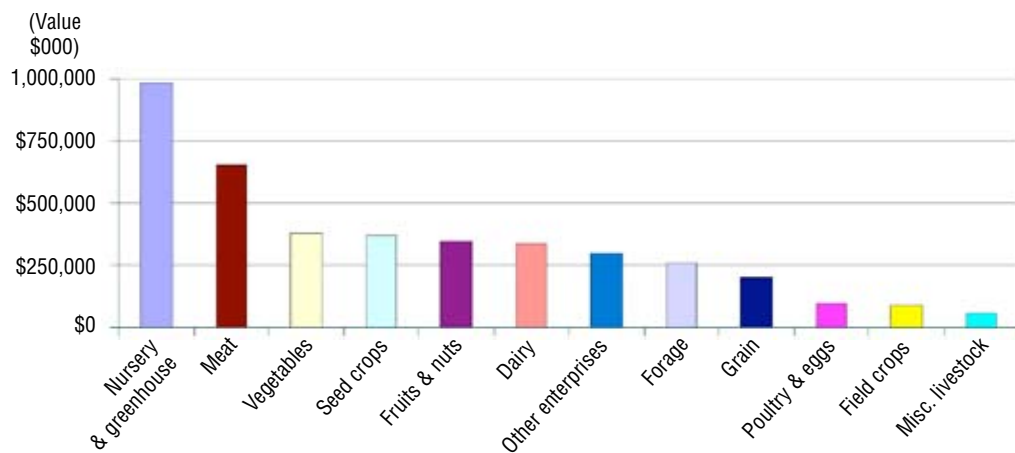
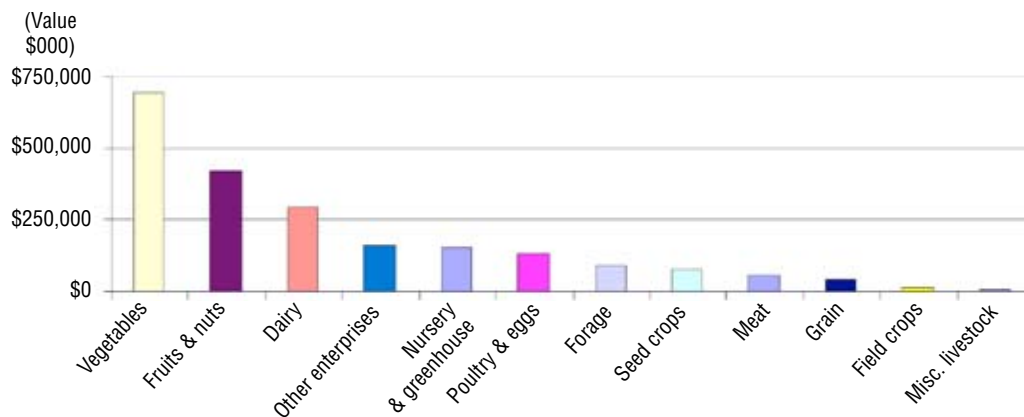


Table 2.—Components of value added, by commodity sector (2005).

| Commodity sector and rank by value added | Components of value added by first handler | | | | | | Total value added (\$000) |
|---|--|------------------------------|-----------|------------------------------|-----------|------------------------------|------------------------------------|
| | Payroll | | Packaging | | Other | | |
| | (\$000) | % of total value added | (\$000) | % of total value added | (\$000) | % of total value added | |
| Statewide | 764,989 | 35.7 | 317,453 | 14.8 | 1,062,169 | 49.5 | 2,144,611 |
| Vegetables (1) | 242,102 | 34.8 | 143,851 | 20.7 | 310,035 | 44.5 | 695,988 |
| Fruit & nuts (2) | 140,702 | 33.5 | 50,650 | 12.1 | 228,371 | 54.4 | 419,723 |
| Dairy (3) | 70,123 | 23.7 | 27,488 | 9.3 | 197,956 | 67.0 | 295,567 |
| Other enterprises (4) | 94,400 | 58.7 | 18,087 | 11.2 | 48,390 | 30.1 | 160,877 |
| Ornamental crops (5) | 56,458 | 36.9 | 7,481 | 4.9 | 89,192 | 58.2 | 153,131 |
| Poultry & eggs (6) | 75,520 | 56.0 | 22,599 | 16.8 | 36,628 | 27.2 | 134,747 |
| Forage (7) | 20,447 | 21.9 | 14,636 | 15.7 | 58,311 | 62.4 | 93,394 |
| Seed crops (8) | 30,424 | 40.0 | 14,841 | 19.5 | 30,747 | 40.5 | 76,012 |
| Meat (9) | 7,366 | 13.8 | 11,431 | 21.4 | 34,615 | 64.8 | 53,412 |
| Grains (10) | 15,501 | 37.9 | 2,735 | 6.7 | 22,650 | 55.4 | 40,886 |
| Field crops (11) | 9,359 | 58.2 | 3,560 | 22.1 | 3,173 | 19.7 | 16,092 |
| Livestock, miscellaneous (12) | 2,587 | 54.1 | 94 | 2.0 | 2,101 | 43.9 | 4,782 |

Figure 2.—Total value added by Oregon first handlers (2005).





Fourteen Oregon commodity categories had total values of more than \$100 million after first-handler delivery (i.e., after first-handler inputs and, if appropriate, delivery to second handlers such as wholesalers or retailers). Nursery, greenhouse, and specialty ornamental crops ranked highest, not because a significant amount of value was added to production but because its farmgate value is so large. Winter pears ranked last in total value after first-handler delivery, at a little more than \$115 million; total value added by first handlers was about \$59 million, outweighing the farmgate value of \$56 million (Table 4, page 6, and Figure 3, page 6).

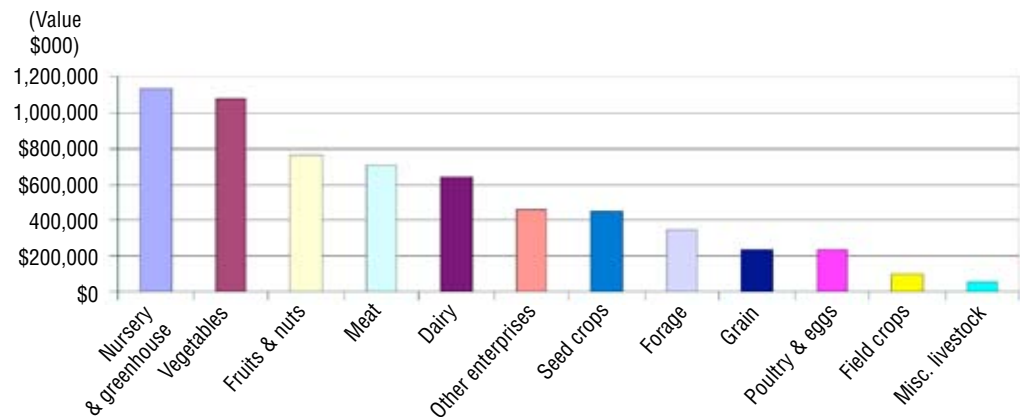
Table 3.—Leading Oregon agricultural commodities, by value added after first handler delivery (2005).

| Commodity | Total value (\$000) | | |
|---|---------------------|------------------------|------------------------------|
| | Farmgate | Added by first handler | After first handler delivery |
| Nursery, greenhouse, & specialty ornamental crops | 853,507 | 124,847 | 978,354 |
| Cattle & calves | 619,491 | 48,632 | 668,123 |
| Milk | 340,062 | 295,567 | 635,629 |
| Farm forest products | 285,431 | 158,185 | 443,616 |
| Potatoes | 116,301 | 217,087 | 333,388 |
| Hay | 218,015 | 78,486 | 296,501 |
| Wheat | 171,248 | 34,591 | 205,839 |
| Onions | 73,406 | 104,266 | 177,672 |
| Perennial ryegrass seed | 146,510 | 28,672 | 175,182 |
| Wine grapes | 36,699 | 135,786 | 172,485 |
| Broiler chickens | 46,663 | 121,262 | 167,925 |
| Christmas trees | 126,436 | 28,284 | 154,720 |
| Tall fescue grass seed | 109,197 | 23,762 | 132,959 |
| Winter pears | 55,936 | 59,169 | 115,105 |

Table 4.—Rankings of Oregon agricultural commodities with value greater than \$100 million after first handler (2005).

| Rank | Rank by farmgate value | Rank by total value added | Rank by total value after first handler delivery |
|------|---|---|---|
| 1 | Nursery, greenhouse, & specialty ornamental crops | Milk | Nursery, greenhouse, & specialty ornamental crops |
| 2 | Cattle & calves | Potatoes | Cattle & calves |
| 3 | Milk | Farm forest products | Milk |
| 4 | Farm forest products | Wine grapes | Farm forest products |
| 5 | Hay | Nursery, greenhouse, & specialty ornamental crops | Potatoes |
| 6 | Wheat | Broiler chickens | Hay |
| 7 | Perennial ryegrass seed | Onions | Wheat |
| 8 | Christmas trees | Hay | Onions |
| 9 | Potatoes | Winter pears | Perennial ryegrass seed |
| 10 | Tall fescue grass seed | Cattle & calves | Wine grapes |
| 11 | Onions | Wheat | Broiler chickens |
| 12 | Winter pears | Perennial ryegrass seed | Christmas trees |
| 13 | Broiler chickens | Christmas trees | Tall fescue grass seed |
| 14 | Wine grapes | Tall fescue grass seed | Winter pears |

Figure 3.—Total value of Oregon agricultural production after first handler delivery (2005).



Farmgate values and value added, by commodity sector

Meat livestock



The meat subsector of livestock includes three commodities: cattle and calves, sheep and lambs, and hogs and pigs. Estimated 2005 farmgate value for the entire subsector is about \$657 million (Table 5, page 9), about 94 percent of which was in cattle and calves. Given the relatively little slaughter and meat processing in Oregon, total value added after first-handler delivery is estimated at about 8 percent. This puts meat last among the leading value-added commodities as ranked by percentage of value added above farmgate sales (Table 1, page 3). Total value added for the meat subsector is an estimated \$53.4 million. About 55 percent of that is in transporting and handling live animals; nearly 24 percent is for labor and “other” expenses (see Table 2, page 4).

Industry insights

Cattle and calves

Ownership of about 75 percent of cattle for beef production is transferred at weaning, at 5 to 7 months of age.* Most weaned animals go to feedlots; the remainder go into backgrounding or stocker programs for extended-time forage feeding, mostly on grass.

Since most calves are born about the same time of year, the stocker program extends the market and may avoid market-price depression that would be created if a glut of animals entered processing. The typical age of a beef animal at processing in the United States is 14 to 16 months. First-handler packing plants are configured to handle animals in a specific size range, which determines market-ready weight.

Stocker programs frequently include moving the animals out of Oregon, though many stay within the state. A typical stocker program sends animals from grazing to the feedlot for finishing where they are put on a high-concentrate ration for 3 weeks. Experienced observers believe these animals often seem healthier than feedlot stock, perhaps because they are older and less stressed. Meat packers typically pay for transporting animals to processing.

*Retained ownership is a growing trend in Oregon’s beef industry. Calves may go to stocker programs or to a feedlot for finishing, but the calf producer retains ownership and pays for transportation and feed; stockers and feedlot operators become feed managers. The producer in this system frequently captures additional values because the animals often go into branded or value-added beef programs. In those cases, carcass merit is very important; premiums are paid for quality attributes. However, producers participating in this system report that the strategy does not pay off consistently.

Feedlot rations for younger animals typically start with 40 to 60 percent roughage (grass hay); the remainder is grain and other protein. A moderate-quality hay is 10 to 14 percent protein. As processing time approaches, the ration is adjusted to include more grain and protein sources and reduced roughage.

Little meat is processed in Oregon. Of the 10 to 16 processing facilities in Oregon, only two do any significant business. Most processing includes smoking and preparing pepperoni and snack foods such as jerky. Oregon is a national leader in this type of meat preparation.



Some in the industry would like to see more small-scale processing plants (500 to 800 head per year) in Oregon, to market high-value beef products, some of which would be branded beef, to consumers and to gourmet restaurants. These plants would encourage small-scale beef production and enterprise diversification for farms of any size.

Sheep and lambs

Average U.S. per-capita lamb consumption is about 1.2 pounds per year. Domestic lamb production is insufficient to meet this demand. In addition, factors such as price, consistency of supply, and quality have encouraged lamb imports.

Oregon ranks tenth in U.S. sheep population. Perhaps because the industry is small here, it is not highly structured. A number of producers market lambs directly to specialty food buyers. Grass-fed lamb is increasingly popular among many retailers. Producers typically receive a premium for it over the price for feedlot lamb. Unlike beef cattle, lamb

can be graded either choice or prime without grain finishing. Prices for grass-fed lamb tend to remain steady, while prices for conventionally produced lamb tend to be quite variable. Many producers finish their own grass-fed lambs on-farm.

Lambing season runs December to April. Lambs born in the Willamette Valley typically are marketed as soon as possible. As grass goes dormant in the valley, lambs are weaned and sold. Perhaps fewer than 20 percent are large enough to go directly to processing. Others are feeder lambs; they are sold and moved to feedlots, outside Oregon. A number of Willamette Valley lamb feeders buy western Oregon lambs and graze them on annual ryegrass, especially in the southern part of the valley. Those lambs usually will be processed at 1 year of age.

In the drier eastern side of Oregon, range flocks usually are born in February and March, weaned in late July or August, and grazed on public lands. These lambs go to feedlots or, if they have gained sufficient weight, to processing. Some ranchers have their own feedlot operations. Smaller groups of lambs in central Oregon may be shipped to the Willamette Valley for finishing on grass seed stubble, though that arrangement appears to be declining.

Fewer than six major first-handler buyers are now in the Willamette Valley. Responsibility for transportation costs varies by marketing arrangement. Some producers in the Willamette Valley are part of a Colorado cooperative which provides for the animals' transportation to a feedlot there and then, after finishing, to a Denver processing plant.

Few third-party feedlots and very little lamb processing still exist in Oregon. Many animals are moved to major feedlots in California and Nevada, and most lambs ready for processing are transported to California or Colorado.

Cull rams and ewes are in demand. Because they are older, their meat has a stronger flavor. U.S. consumers typically prefer the milder flavor of lamb. Traders buy culls and sell many into Mexico. Few U.S. processors handle cull sheep, though some do for pet food.

Hogs and pigs

Nationally, the trend in hog production is toward complete vertical integration. Typical Midwest swine operations have 100,000 sows in a single ownership, and producers mill their own feed and

control animal processing. At this enterprise scale, consolidation is the key to profitability.

Oregon remains outside this trend: small, family-farm operations prevail. However, industry observers report that niche marketing keeps pigs economically viable in Oregon. Oregon pork producers enjoy the interest of natural food stores and gourmet restaurants, rather than of the national pork market. Well over half of Oregon-produced pigs move into niche markets. Producers marketing smaller pigs for roasting or whole pigs for barbecuing frequently receive price premiums from direct-market purchasers and natural food stores. Some producers have found sales to youth seeking 4-H and FFA project pigs a profitable market.

Oregon now counts a handful of commercial-size production operations—no more than 300 sows each. Until the 1980s, however, the industry in Oregon was more robust. Hog marketing organizations were active; hogs were pooled weekly and shipped to the plant giving the best price. Until 1982, several large national processors had plants in Portland. Since, the nearest significant processing outlets are in Seattle or Los Angeles. This not only has increased shipping charges but also losses due to deaths from transportation stress. The fact that the major processing plants are set up to handle a specific range of carcass sizes is a barrier to pooling smaller lots of hogs, since animals in the pool might vary from the preferred size range. By 1985, many Oregon producers had left the industry.

Today, about 90 percent of the pork consumed in Oregon comes from outside the state. The remaining 10 percent is direct-marketed to Oregon consumers or retailed through smaller outlets. With few exceptions, hogs are not processed here. However, a few first handlers contract with producers to custom-process pork products, and some pork packing in Oregon is for export abroad. In some cases, first handlers package meat under their own labels.

Farmgate prices in many cases tend to be tied to Midwest packing house quotes. But in other cases, first handlers set a year-round price which tends to be somewhat above Midwest quotes. Sales to food distributors and restaurants and through farmers' markets tend to improve producer returns.

The challenge, as always, is adequate packing and processing facilities. Some industry observers believe niche pork marketing would be greater if USDA-inspected processing plants were available to Oregon pork producers. At present, because processing is limited, pork production and marketing are limited.

Lean meats are increasingly in demand, and nationally the pork industry has moved in that direction. Some industry observers believe the move has gone almost too far; the trend today is a return toward a medium ground. Bacon demand, which had begun to decline in the early 1980s, reemerged as a fast-food item by the mid-1990s. Many pigs today are bred to produce more bacon, and link sausage is increasingly popular as a value-added product. The industry is researching processes that will produce convenient, precooked pork that retains taste and texture.



Table 5.—Value added meat (2005).

| Commodity | Farmgate value (\$000) | Value added by first handler (\$000) | | | | | Total value after first handler delivery (\$000) |
|-----------------|------------------------|--------------------------------------|------------------------|---------------------------|-------|--------|--|
| | | Payroll | Processing & packaging | Transportation & handling | Other | Total | |
| Cattle & calves | 619,491 | 6,486 | 9,729 | 27,878 | 4,539 | 48,632 | 668,123 |
| Sheep & lambs | 27,204 | 399 | 285 | 1,224 | 199 | 2,107 | 29,311 |
| Hogs & pigs | 9,900 | 481 | 1,417 | 347 | 428 | 2,673 | 12,573 |
| Total | 656,595 | 7,366 | 11,431 | 29,449 | 5,166 | 53,412 | 710,007 |

Dairy livestock



Dairy producers in Oregon received an estimated \$340 million for their milk in 2005 (Table 6, page 11), the third highest of all commodity farmgate receipts in Oregon. The 2005 farmgate prices, above \$14/hundredweight, were toward the higher end of the price range in the previous few years. In 2006, prices trended lower, and producers were squeezed between lower milk prices and increasing costs for feed and other inputs; as many as 40 dairies went out of business. In 2007, however, prices turned around with growing world demand and droughts affecting international production. The highest prices in history for fluid milk, \$21/hundredweight, are being paid in 2007. Other dairy products are also at record highs in 2007.

First-handler value added in 2005 was estimated to be almost \$300 million, about 87 percent above farmgate value. Payroll and other components were a bit below Oregon's livestock industry average as a percent of total value added, but the overall first handler value added for this commodity is more than five times that for meat. Other contributions to dairy value added generally included transportation, storage, financing, management, utilities, general overhead, and governmental fees and taxes.

Processing, packaging, and handling added 52 percent in value to fluid milk, a bit above the livestock industry average. Cheese production added almost 64 percent in value to raw milk; of that, more than half was capital and operating expense associated with processing.

Industry insights

Many Oregon dairy producers are members of cooperatives which serve as first handlers. Co-op members receive a dividend based on their share of the ownership in the co-op and the volume of milk they produce. The producer generally pays to transport raw milk to the first handler, though this varies by county. The first handler processes milk into a wide variety of dairy products, packages them, and markets the products to wholesalers or directly to large retailers. Nationally, large quantities of cheese, butter, and dry milk products move from one processor to another for additional processing, but little of this is done in Oregon. Here, some butter is repackaged for such things as the restaurant butter-pats trade.

Dairy products are sold as fluid milk (less than one-third of Oregon's fluid milk reaches the consumer as fluid milk) or as soft products such as sour cream, cheese, and yogurt (fermented products), and ice cream, or as butter or dried milk. Producers receive the highest return on dairy production sold as fluid milk, a highly perishable product. Milk that becomes brand-name cheese is next in farmgate value.



Consumption and production of dairy products in Oregon are approximately equal, though Oregonians do not consume only Oregon-produced dairy products. Cheese, especially, comes from outside the state. Oregon also exports: more than half of Tillamook's production sells outside Oregon, and about 20 percent of Oregon's fluid milk production is sold out of state in some form.

In Oregon since 2000, and in Washington since the early to mid-1990s, the dairy cow industry has been leaving the wet west side of the states. New dairies in Oregon look for land only in drier regions. The cost of land is certainly one reason; another is that it's easier in drier climates to control environmental impacts associated with dairy production. The cost of developing dairy herds and processing plants is very high. Those who commit to even small operations face extensive food-safety requirements. If not handled properly, all dairy products can be hazardous to human health. Hence, efficient market development is critical for successful dairy operations of any size; it permits the increased expense of handling a fragile product to be distributed across more units sold, reducing the cost per unit. Name recognition is a very important marketing strategy for first handlers. Darigold, Rose Valley, and Tillamook Creamery Association, for example, are brands that consumers recognize.

Gourmet, specialty, and farmstead cheeses and organic dairy products are growing trends in Oregon. However, artisanal cheeses represent only a minor portion of cheese production. Usually, producers engaging in this enterprise divert only a portion of their milk to cheese and sell the remainder through standard pools. Many in the dairy industry view volume sales as the key to success in the cheese industry, and see consumer education as key to increasing sales volume. Those who mass merchandise to large wholesalers and retailers lose the price advantage of more direct-to-consumer

outlets. Yet, some smaller producers may have trouble selling a sufficient quantity to cover costs and returns, despite the very high premium many consumers are willing to pay for specialty cheeses.

Farmstead cheese—whether cow, sheep or goat—is made on the farm where the milk is produced. Currently, at least three major dairy cow farms make farmstead cheese. An Oregon gourmet or specialty cheese is made from specific milk sources: one herd or a designated group of herds. Industry observers have seen strong growth in Oregon specialty cheeses, from four specialty cheese makers in 2000 to 13 dairy processing plants licensed by the Oregon Department of Agriculture (ODA) in 2005. The prediction is that ODA will be licensing as many as 35 new specialty cheese processors in the coming few years.

Artisanal goat's milk cheese, made primarily on the farm where the milk is produced, is increasingly popular with consumers. Some in the industry believe that large goat dairies may develop in Oregon. Fluid goats' milk is more fragile even than cows' milk. The highly structured distribution system that supports cows' milk does not exist for goats' milk. There is a relatively extensive farm-direct sales network for these products.



Recently, sheep's milk cheese has become popular. At this time, milk from three species of sheep is used. Some in the dairy industry see growing potential for sheep and goat cheese as consumers become aware of these products; now, however, both are very small compared to dairy cow cheese.

About 6 to 7 percent of Oregon milk production is certified organic. A small amount of this is processed or bottled for sale outside Oregon. In general, organic dairy products command a premium of at least double the price of conventionally produced dairy products.

Table 6.—Value added dairy (2005).

| Commodity | Farmgate value (\$000) | Value added by first handler (\$000) | | | | Total | Total value after first handler delivery (\$000) |
|----------------------|------------------------|--------------------------------------|------------|---------------------|--------|---------|--|
| | | Payroll | Processing | Packaging materials | Other | | |
| Milk & milk products | 340,062 ¹ | 70,123 | 160,419 | 27,488 | 37,537 | 295,567 | 635,629 |

¹ 23,773,654 cwt at \$14.43/cwt.

Poultry and eggs



The poultry and egg subsector of Oregon's livestock industry consists of young chickens grown for broilers, chicken eggs for both fresh consumption (called table eggs) and processing, and culled laying hens. In 2005, the total farmgate value of all poultry and eggs was about \$97.5 million and included production of about 22.4 million broilers and 67.9 million dozen eggs (Table 7, page 13). Eggs brought in a little more than 50 percent of farm-

gate value and broilers almost 48 percent. Sales of cull chickens and other species of poultry were quite insignificant.

Value was added in four categories: payroll, processing, packaging and materials, and "other." Processing, packaging, and other materials included preparation expenses, containers for eggs, and packaging for whole broilers and broiler parts. "Other" included transportation and handling, storage, general overhead, management charges, utilities, accounting, taxes, and fee and license expenses.

Total value added for Oregon's poultry and egg industry was \$134.7 million in 2005, about 138 percent above farmgate sales. About 56 percent of the value added was in payroll-related expenses for moving broilers and eggs toward wholesale and retail buyers. That percentage compares with an average 32 percent value-added labor portion for the entire livestock industry in 2005. The remaining portion of value added from all poultry and eggs was split somewhat evenly between processing, packaging, and other (see Table 2, page 4).

The major contributor to value added in the subsector was the relatively high ratio for the broiler industry: 260 percent. Just over 90 percent of all value added was contributed by broilers. Payroll for preparation and packing facilities was a major factor.



Table 7.—Value added poultry and eggs (2005).

| Commodity | Farmgate value (\$000) | Value added by first handler (\$000) | | | | | Total value after first handler delivery (\$000) |
|------------------------|------------------------|--------------------------------------|------------|---------------------|--------|---------|--|
| | | Payroll | Processing | Packaging materials | Other | Total | |
| Broilers ¹ | 46,663 | 72,757 | — | 18,187 | 30,318 | 121,262 | 167,925 |
| Eggs ² | 50,367 | 2,664 | 5,600 | 4,412 | 608 | 13,284 | 63,651 |
| Other poultry products | 497 | 99 | — | — | 102 | 201 | 698 |
| Total | 97,527 | 75,520 | 5,600 | 22,599 | 31,028 | 134,747 | 232,275 |

¹ 22,434,350 head at \$2.08/head (weighted average price).

² 67,880,000 doz at \$0.742/doz (weighted average price).

Industry insights

Broilers typically are produced under contract. Producers usually own the facilities and provide labor and utilities. The first handler provides transportation, feed, chicks, and technical help; owns the chickens; and specifies production practices. The processor usually retains title to the packed chicken until delivered to the retailer's dock. Payments to producers sometimes are calculated simply on the basis of floor square footage. Or, payments are calculated by a formula that rewards lower unit costs with higher producer returns.

Broiler production is a year-round activity in Oregon. Chickens raised as broilers attain market weight in 42 to 45 days. Birds are transported live to the processing plant. Most broiler chickens grown in Oregon are processed in Washington and sold fresh. Preparation, cleaning, and packaging are done at the processing plants. Birds cut into parts are typically handled by machine; deboning for meat products is done by hand. Compared with other parts of the U.S., the freezing capacity for chicken products in Oregon is quite limited.

Oregon has three major producers of table eggs; all own production farms. Company operations are heavily vertically integrated, though chicks typically are bought from outside suppliers. Oregon's table egg production rate slightly exceeds



its consumption rate. However, Washington and some eastern states sell a significant number of eggs in Oregon, and eggs produced in this state frequently are sold to retailers in Hawaii and other states.

About a third of all eggs break during processing. “Breakers” from Pacific Northwest states, along with lower grade Oregon eggs, are processed in Oregon. When sold directly to consumers, they typically are in small containers of fat- and cholesterol-free egg products. Ton-totes and 55-gallon drums of whole-egg product also are sold to institutions and businesses such as bakeries. Some eggs are hard-cooked for institutional packs and for deli and restaurant salad bars.

Viral infections such as bird flu are a constant risk in the industry and could affect the cost of poultry production. Though there is no serious concern in Oregon at this time, many producers and processors are on constant watch for signs of disease and are ready if an outbreak occurs. U.S. consumers do not appear highly concerned about outbreaks of avian flu—in contrast to European consumers, who perceive the threat much more keenly. Outbreaks reported in Europe are followed by sharp reductions in consumption of egg and poultry products. Typically, this indirectly affects western U.S. poultry producers, as U.S. East Coast producers dump price-depressing quantities of poultry products here when they cannot be sold in Europe.

Miscellaneous livestock



This subsector includes horses, llamas, alpacas, mink, and relatively minor commodities such as wool, honey and beeswax, rabbits, goats, buffalo, and emus. Total farm-gate value in 2005 was an estimated \$55.2 million (Table 8, page 15). Horses and mules were the most significant in sales at \$22.7 million, just over 40 percent of sales in this subsector.

Value added amounted to \$4.8 million, 9 percent above farmgate value. A little more than half the value added was in first-handler labor—mostly auctions and private sales of horses, llamas, and alpacas. With the exception of wool, very little processing is done in this subsector. Wool first handlers add a relatively small portion of value in labor but a considerable portion in processing, packaging, transportation, handling, and financing the production of spun and other wool products.

Industry insights

Horses

Oregon's equine population was sixteenth in the nation in 2002, according to the Oregon Census of Agriculture. About 60 percent are ranch working horses or part of a riding string. Many ranches have 10 or more horses; some have 40 or 50. Cattle ranchers tend to breed their own horses, which are used as replacement stock for the string, sold as finished mounts, or sold as unbroken young stock when 1 or 2 years old. Training adds to a horse's value; some breeders train their own horses or have trainers on-farm. Three- to 4-year-old broke horses typically are valued between \$3,500 and \$8,500. About half of Oregon's horse breeders have pedigreed, registered animals.

Pleasure horses are fewer than ranch working horses, but far more economic activity relates to them than to other horses as owners spend significant amounts for tack, feed, trailers, fencing, and structures. The average owner has two pleasure horses. These often are unregistered grade horses or former performance horses that no longer compete. Some are valued as highly as \$30,000 to \$40,000, but many are at \$1,500 to \$10,000.

Discipline horses have been trained for harness driving, cutting, reining, or dressage, skills that add value to the horse or enhance its possible earnings. In Oregon, these horses can sell for \$10,000





to \$150,000 depending on lineage and skills. Well-bred, well-trained race horses have a much higher value, but Oregon is not recognized for racing horses. High-value horses leave the state because, although Oregon has breeding programs and trainers, few performance shows or similar events are hosted here. In Oregon, such a horse will not attract the attention that it might in midwestern or eastern states.

Oregon auction yards typically handle 20 to 30 horses per month, according to monthly summary reports to the Oregon Department of Agriculture (ODA). Many horses are sold in-state, but a significant portion are sold to out-of-state buyers. No Oregon sales records are required for sales between private parties. Estimates are that 5,000 to 6,000 horses per year are sold privately, including most pleasure horses.

Wool

Oregon's sheep industry focuses on breeds valued for meat rather than for wool. Still, the state has a small sector of wool production. International markets, especially the supply of Australian wool, affect U.S. sheared wool values. Virtually no U.S. wool is processed into textiles in this country; much of it goes to India and China for processing.

Larger Oregon wool operations have their own shearing crews. The producer typically is responsible for baling and for testing fiber diameter. Based on that testing, bales are lotted and sold to processors for scouring (washing and topping the wool to align the fibers), though some wool may be sold without testing. After spinning, the wool is sold to clothing manufacturers or to retail outlets.

Some smaller producers in Oregon have formed wool pools, which invite bids from processors. Many of these pools are organized outside

Table 8.—Value added miscellaneous livestock (2005).

| Commodity | Farmgate value (\$000) | Value added by first handler (\$000) | | | Total value after first handler delivery (\$000) |
|-------------------|------------------------|--------------------------------------|--------------|--------------|--|
| | | Payroll | Other | Total | |
| Horses & mules | 22,740 | 911 | 682 | 1,593 | 24,333 |
| Wool ¹ | 706 | 56 | 378 | 434 | 1,140 |
| Other livestock | 31,774 ² | 1,620 | 1,135 | 2,755 | 34,529 |
| Total | 55,220 | 2,587 | 2,195 | 4,782 | 60,002 |

¹ 1,629,580 lb at \$0.442/lb.

² Comprising honey and beeswax \$2,803,000; rabbits \$1,946,000; and llamas, alpacas, emus, mink, etc. \$27,025,000.

Oregon. The pool typically pays for transportation to the processor and retains title until the wool is delivered. Other wool producers have developed direct marketing outlets to hand spinners, weavers, and other wool crafters.

Market interest in sheep pelts is quite variable. Prices depend on foreign-buyer interest and on fashion trends. Pelts frequently are shipped raw overseas to countries with a tradition of pelt crafting. High-quality pelts have sold for as much as \$15 each, but more recently have wholesaled at less than \$5.

A trend in Oregon and other states is toward sheep breeds that produce hair rather than wool. These sheep don't require shearing, a benefit when shearing costs are above the wool's market value. However, cross-breeding wool- and hair-producing sheep has reduced the quality of the resulting wool fiber.

Llamas and alpacas

The alpaca and llama industries are clearly segregated. More than 13,300 llamas were estimated to be in Oregon in the 2002 Census of Agriculture, and about 6,300 alpacas were registered in Oregon in 2005. Currently, some industry observers believe, the numbers of llamas and alpacas may be about equal, though a sharp drop in llamas' economic value in recent years has reduced owner incentive to register them, making population estimates more difficult. The price drop is because supply has greatly outpaced demand for this animal, which lacks a general commercial use in the United States.

Llamas are valued for breeding, as guard animals for other livestock such as sheep and lambs, as 4-H project animals, as show animals, and for packing and trekking services. Typical llama values have ranged from \$500 to \$10,000 depending on show quality. Most sales are private, but occasional auctions are held in Oregon and other states.

At this time, alpacas have a higher market value than llamas, principally because of the quality of their fiber but also because of high demand for breeding animals. An alpaca fiber cottage industry has developed in the United States; however, not enough fiber of any one of the 22 natural alpaca colors is shorn at one time to supply a large domestic mill.

Perhaps three-quarters of alpaca sales are private; the remainder are at auction. Breeding alpacas sold at auction in Oregon may average \$40,000 to \$50,000; some very exceptional animals may go for as much as \$200,000 to \$600,000. However, a more typical price for female breeding alpacas may be closer to \$20,000 and males as high as \$10,000 if they are of superior stock. The price for males varies much more than that for females. A lower quality alpaca male for breeding might go for as little as \$500.



Mink

The Oregon mink industry is small but has a long history. Oregon is a distant third in mink pelt production, behind Wisconsin and Utah. Historically, the mink also was valued for its liver, an excellent source for vitamin A oil, but that market has declined with the advent of synthetic sources. Almost all Oregon-produced pelts are sold at auction, some on the East Coast but most through the Seattle Fur Exchange, a grower-owned cooperative; a major portion of buyer interest is in Japan, Korea, Italy, and the United Kingdom. Today, mink producers' challenges include increasing pressure from animal rights groups opposed to mink production and a U.S. consumer preference shift toward synthetic substitutes for mink—except for mink trim on cloth coats, which is an expanding market.

Mink pelts vary in color; most in Oregon are standard black. Pelts are pooled and lotted at auction according to color and quality. Most pelts are sold dried at auction and are tanned by the furrier to soften and preserve them. However, some Oregon producers tan their own pelts.

Some producers have developed breeding programs and sell to other producers. These breeding programs are directed by the value placed on pelts at auction, according to desired fur characteristics. Some skinned carcasses are sold for crab bait. Mink are fed low-value processed chicken parts, otherwise a waste product.

Goats

Producers and marketers of goats are optimistic about growth potential in their industry, which is currently very small in Oregon. Consumer interest in goat meat, milk, and cheese is increasing, and goat-meat pools already are forming and live-goat purchases for sale outside Oregon are being organized. See more about goats under "Dairy Livestock," page 11.

Tree fruit and nuts



Tree fruit and nuts are considered high-value crops: growers can expect more income per acre than from a commodity like wheat or field corn. However, a greater risk is associated with producing these high-value crops. They are more susceptible to weather damage, and the mature produce demands more careful handling to preserve quality.

Oregon fruit and nut growers generated about \$208 million in farmgate sales in 2005. Of that, pears accounted for just over \$81 million, about 39 percent of sales. The major tree fruits—Bartlett and winter pears, sweet cherries, and apples—contributed \$163 million, or more than 78 percent of farmgate sales (Table 9, page 18).

The only major commercial nut crop remaining in Oregon is hazelnuts, which amounted to almost \$40 million, or almost 20 percent of farmgate sales in this sector. A number of other tree fruit and nut crops, some significant in Oregon’s agricultural history, now total just \$5.6 million or less than 3 percent of Oregon farmgate sales in 2005. Peaches, prunes, plums, and English walnuts are in this group. While some of these crops have stayed rather steady over the years, the Oregon commercial walnut industry has declined noticeably.

On the whole, fruit and nut crops contributed an estimated value added of \$208.6 million, about equal to total farmgate value. Value added as a percentage of farmgate value ranged from about 52 percent for sweet cherries to 128 percent for Bartlett pears. Value-added cost categories are quite diverse among the crops, but payroll and packaging were typical.

As a percentage of 2005 value added, payroll-related expenses contributed about 44 percent and packaging materials just over 10 percent. Payroll in this sector is above average, but packaging materials and “other” value added are below average (Table 2, page 4). Depending on the crop, the “other” category included assembly, fresh-pack sorting, freezing, canning, storage, transportation, brokerage fees, management and administrative fees, utilities, general overhead, return on capital equipment, insurance, taxes, interest, and various fees.

Industry insights

Tree fruit

Oregon has significant orchard production in the mid-Columbia region and the Rogue Valley. Orchard fruits aren’t grown on contract; rather, growers typically agree to send a specified percentage of their production to the packing house to supply fresh fruit demands. The packing house traditionally unloads, drenches, stores (under either regular or controlled atmosphere conditions), and packs the fruit into boxes or bags, and sells it to a wholesaler or retailer. A packing house typically distributes net proceeds back to growers, after deducting the house’s total costs of doing business, which include field staff who are assigned to specific growers. Field staff advise on which varieties to plant, horticultural practices, and

harvest timing. Pest control usually is provided by independent advisers or by contractors associated with chemical companies.

Oregon has enough infrastructure to pack all the state's tree fruit production. However, Oregon's apple production and first-handler capabilities are small compared to Washington's. In tonnage, Washington's apple crop is about 30 times that of Oregon. Washington packing houses have a high demand for Oregon fruit; some Washington growers are even buying orchards in Oregon. A large portion of Oregon apples, as well as some pears and cherries, are shipped to Washington for packing and distribution. These packing houses assume some of the shipping costs and offer a premium for quality. One strength of the large packing houses is that they supply major grocery retailers with a suite of fresh tree fruit over a long season.



About a third of Oregon's tree fruit are exported, principally to Canada, Latin America, Pacific Rim countries, Middle Eastern countries, and the European Union. Chile, Argentina, Australia, and New Zealand are the major fresh tree fruit competitors for U.S. growers.

The United States exports about a third of domestic pear production and imports about a third of pears consumed domestically. This exchange is driven by the year-round demand for fresh fruit and the production cycle timing in the northern and southern hemispheres. Many industry observers believe that the North American Free Trade Agreement (NAFTA) has promoted the sale of Oregon pears and apples to Mexico.

Although harvesting the major tree fruits—cherries, pears and apples—is labor intensive, research has contributed to the development of more densely planted and trellised orchards and mechanical aids for pickers. Pest management research also has enabled reduced pesticide use. These new production systems begin to pay off sooner after orchard establishment, provide a greater return per acre, and reduce production costs through greater labor efficiency.

Tree fruit production and first-handler activities are important to local economies, though their impact on Oregon's total agricultural economy is relatively modest. During harvest season, intense fresh packing and processing activity generates seasonal employment and creates a demand for

other services in those communities. Throughout the year there is much investment and employment in additional packing, storage, and shipping.

Bartlett pears typically are processed; as much as a third of Oregon's crop is canned. New-product development, such as pears processed and packaged in clear-glass jars, hasn't yet had much influence on production systems, nor has a strong market demand developed for this product; however, it is diverting some high-quality fruit from the fresh market, which might strengthen pear fresh-market prices.

Asian pears and winter pears, such as Comice, Sekel, Anjou, and Bosc, are eaten fresh. Increasingly, packing houses immediately sort fresh pears by variety for

Table 9. Value added tree fruit and nuts (2005).

| Commodity | Farmgate value (\$000) | Value added by first handler (\$000) | | | | Total value after first handler delivery (\$000) |
|--------------------------------------|------------------------|--------------------------------------|---------------------|--------|---------|--|
| | | Payroll | Packaging materials | Other | Total | |
| Apples ¹ | 38,221 | 18,304 | 2,936 | 19,832 | 41,072 | 79,293 |
| Hazelnuts ² | 39,536 | 12,479 | 3,419 | 31,018 | 46,916 | 86,452 |
| Bartlett pears ³ | 25,096 | 12,239 | 5,078 | 14,770 | 32,087 | 57,183 |
| Winter pears ⁴ | 55,936 | 37,925 | 3,132 | 18,112 | 59,169 | 115,105 |
| Sweet cherries ⁵ | 43,689 | 7,720 | 4,972 | 10,223 | 22,915 | 66,604 |
| Other tree fruit & nuts ⁶ | 5,587 | 2,406 | 1,407 | 2,627 | 6,440 | 12,027 |
| Total | 208,065 | 91,073 | 20,944 | 96,582 | 208,599 | 416,664 |

¹ 3,661,274 boxes at \$10.45/box (weighted average price).

² 17,813 tons at \$1.10/lb (weighted average price).

³ 74,473 tons at \$337/ton (weighted average price).

⁴ 194,349 tons at \$287.80/ton (weighted average price).

⁵ 32,617 tons at \$1,339.45/ton (weighted average price).

⁶ Includes tart cherries, peaches, Asian pears, prunes and plums, apricots, walnuts, and other miscellaneous tree fruit and nuts.

size and grade and move the fruit into controlled storage. Juicers and culls are sold immediately, eliminating the need for further storage. This maximizes storage capacity and permits accurate estimates of the potential for repacking into standard lugs and trays for retail.

Over the past 15 years, Oregon sweet cherry production has moved away from “briners,” used for maraschino cherries, and toward fresh-market products. Fresh cherries are sold domestically, both at retail and through direct-marketing channels, and they are exported. Asia has emerged as a market for large, tasty cherries, air-shipped for freshness. Much research has supported the development of new varieties and rootstocks to meet growing fresh-market demand. The length of the harvest interval has doubled in the past 15 years, contributing to the profitability of processing infrastructure and to prospects for industry workers.

Oregon has a small but steady tart cherry industry, centered in the north Willamette Valley. Virtually all the crop is frozen or dried, and production is regulated by a federal marketing order. Oregon tart cherry production declined after several important processors relocated out of state. Today, Michigan produces about 70 percent of the U.S. crop.

Historically, plums were grown widely in the Willamette Valley. Today California dominates, producing 99 percent of the domestic plum crop and 70 percent of the world's. Oregon has far fewer first handlers, only a few processors who dry plums (though a few growers dry plums on-farm and provide these services for other growers), and a very limited market for frozen plums. The trend for larger Oregon growers is to replace plum trees with other tree fruit or nut species. Nevertheless, fresh plums remain a stable, but smaller, outlet. Farm-direct sales are a significant part of this small fresh market: U-pick, farm stand, and farmers' markets.

Nuts

U.S. hazelnut production is centered in the Willamette Valley. The United States produces 3 to 5 percent of world hazelnut tonnage, ranking third in the world behind Turkey and Italy. However, crop failures in other production regions, or in other nut crops, can increase demand for Oregon hazelnuts greatly. Some 20 to 30 first handlers, the majority grower owned, operate in Oregon. Hazelnut farmgate prices are negotiated annually between the major first handlers and the Hazelnut Growers Bargaining Association (HGBA). The



major share of the wholesale market price goes to the growers. Most of Oregon's crop is sold to food manufacturers or food retailers; about half is exported. Hazelnut kernels are processed into chopped nuts, nut paste, and flour. There is some farm-direct marketing of hazelnuts through various local channels. Under a federal marketing order, Oregon's Hazelnut Marketing Board controls the tonnage moving into the domestic in-shell market. The remaining tonnage moves into shelled markets and export in-shell markets.

Oregon's hazelnuts are high quality. The Ennis variety produces large kernels valued for the lucrative in-shell market. Unfortunately, Ennis is susceptible to eastern filbert blight (EFB), which is spreading through Oregon's growing area. Newer kernel varieties with Turkish parentage often yield small kernels that only can be sold shelled. The OSU Hazelnut Breeding program now has some genotypes in the evaluation phase that are completely resistant to EFB and are large enough for the in-shell market.

Until the 1955 freeze, Oregon was a major walnut producing and marketing state. Additional natural disasters—the 1962 Columbus Day storm and another freeze in 1972—added pressure on growers to convert to other enterprises. Oregon production of English walnuts has continued to decline; only about 1,000 acres were harvested in 2005. California dominates the world walnut market, providing 99 percent of domestic production and 66 percent of the world's.

There is a small, steady market in the region for walnut meat and in-shell walnuts. Many in-shell walnuts contribute value to gift baskets. Direct marketing through farmers' markets and roadside stands is common. The few remaining first handlers of walnuts in the state no longer provide their services to other producers. The few large commercial growers who do their own drying sell domestically and to established export markets.

Berries and grapes



This sector includes berry crops and wine grapes, all of which also are considered high-value crops. Combined, Oregon berry and grape growers generated about \$135 million in farmgate sales in 2005 (Table 10, page 21). Of that, berry crops accounted for almost \$100 million, about 73 percent of the sector total. Wine grapes, a growth industry in Oregon, contributed \$37 million, just under 27 percent.

Berries and wine grapes contributed an estimated value added of almost \$211 million, about 156 percent of farmgate value. Value-added cost categories are quite diverse among the crops, but payroll and packaging typically were reported. As a percentage of 2005 value added, payroll-related expenses contributed almost 25 percent and packaging materials just over 14 percent. Payroll is below average for an Oregon agricultural sector (see Table 2, page 4). In contrast, “other” value-added activities are above average at more than 62 percent; much of this is due to the wine industry. Depending on the crop, the “other” category included such things as assembly, fresh pack sorting, freezing, canning, storage, transportation, brokerage fees, management and administrative fees, utilities, general overhead, return on capital equipment, insurance, taxes, interest, and various fees.

Among crops, value added as a percentage of farmgate value ranged from about 37 percent for cranberries to 370 percent for wine grapes. Cranberry processing is limited in Oregon; the predominant first-handler functions are assembling, sorting, cooling, transporting to cold storage, and shipping to buyers for further packing and processing outside the state. In comparison, much more value was added to wine grapes in state. The value added for wine grapes included a much lower-than-average 23 percent estimated for payroll, a higher-than-average 18 percent attributed to packaging materials, and “other” expenses of about 60 percent. That reflects wine production’s much higher investments in on-site equipment, handling, storage, and distribution.

Industry insights

Berries

The caneberry category includes Marion, Boysen, Logan, Evergreen, and other blackberries, and red and black raspberries. This industry is intensely centered in the Willamette Valley and especially in Marion and Clackamas counties, where more than half of the state’s production originates. Oregon leads the nation in the production of black raspberries, boysenberries, and blackberries and is third to Washington and California in red raspberry production.

Most commercial caneberry production is processed. Sales of caneberries as a whole have been rather steady in recent years, with fairly regular sales of block frozen, individually quick frozen (IQF), frozen purée, dried berries, and juice to well-established markets. Prices at the grower level can be volatile because markets are very sensitive to oversupply. Processors, concerned about interest and other warehousing costs of holding product in storage during the off-season, will drop the grower price if it looks as if the product will be in oversupply.

Table 10. Value added berries and grapes (2005).

| Commodity | Farmgate value (\$000) | Value added by first handler (\$000) | | | | Total value after first handler delivery (\$000) |
|----------------------------------|------------------------|--------------------------------------|---------------------|---------|---------|--|
| | | Payroll | Packaging materials | Other | Total | |
| Strawberries ¹ | 13,359 | 3,206 | 935 | 6,012 | 10,153 | 23,512 |
| Marion blackberries ² | 27,769 | 4,443 | 1,947 | 19,772 | 26,162 | 53,931 |
| Cranberries ³ | 15,138 | 2,739 | 516 | 2,392 | 5,647 | 20,785 |
| Blueberries ⁴ | 23,442 | 5,049 | 992 | 13,614 | 19,655 | 43,097 |
| Other berries ⁵ | 19,018 | 2,998 | 1,463 | 9,260 | 13,721 | 32,739 |
| Wine grapes ⁶ | 36,699 | 31,194 | 23,853 | 80,739 | 135,786 | 172,485 |
| Total | 135,425 | 49,629 | 29,706 | 131,789 | 211,124 | 346,549 |

¹ 28,032,000 lb at \$0.477/lb (weighted average price).

² 40,788 lb at \$0.681/lb (weighted average price).

³ 441,368 barrels at \$34.30/barrel (weighted average price).

⁴ 26,657 lb at \$0.8795/lb (weighted average price).

⁵ Includes red and black raspberries, evergreen blackberries, boysenberries, loganberries, and gooseberries.

⁶ 25,800 tons at \$1,422.45/ton (weighted average price).

First handlers who fresh pack caneberries see similar price volatility as the fruit supply increases and decreases. While some fresh caneberries are packed and handled for long-distance shipping by air freight or truck, the majority are sold in local and regional markets.

Strawberry production also is centered heavily in the Willamette Valley, especially in Marion and Washington counties, which produce more than 75 percent of the state's crop. About 90 percent of the crop is processed. Freezing in a variety of forms, puréeing, freeze-drying, and to a lesser extent juicing are the most common processes adding value to Oregon strawberries. The processed fruit is used mainly in ice cream, yogurt, and jams.

Strawberries must be hand-picked. Low strawberry prices and one of the highest minimum wages in the nation mean that Oregon strawberry growers have difficulty recovering production and harvest costs. Strawberry acreage has steadily declined to less than 65 percent of what it was in the late 1980s; just 2,665 acres were harvested in 2005.

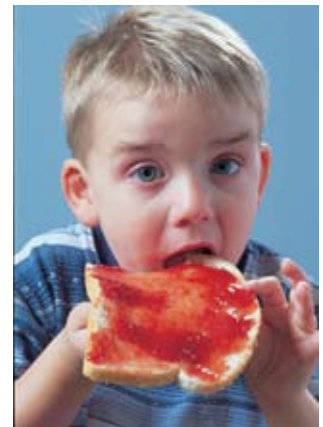
Western Oregon has ideal growing conditions for blueberries. Production of this crop has increased

greatly over the past 15 years; acreage has nearly tripled, from 1,450 acres in 1990 to 4,400 in 2006. Although blueberries are produced throughout the Willamette Valley, coastal, and mid-Columbia regions, more than two-thirds of blueberry acreage is in four Willamette Valley counties: Marion, Washington, Clackamas, and Yamhill.

Varying with the year, approximately 60 percent of the blueberry crop is processed as IQF, bulk frozen, puréed, juiced, or freeze dried. Thirty-five percent is sold through fresh-market outlets; on-farm sales account for about 5 percent of the blueberry market.

Demand for blueberries for fresh-market sales almost doubled between 1999 and 2005, from 6 to 12 million pounds in Oregon. Japan is a significant importer of frozen Oregon blueberries, buying between 5 and 8 million pounds per year. Some of blueberries' current popularity at home and abroad may be due to their research-based reputation for health benefits.

For many years, Oregon cranberries were grown by member growers exclusively for the Ocean Spray Cooperative. Today, at least five well-established



independent handlers receive about 60 percent of the crop. Expansion of Oregon's cranberry production is limited by water rights, rather than access to markets, because fields are flooded to facilitate harvest. At present, Oregon's cranberry production is limited to three coastal counties, an area unique in the nation because its long growing season supports full color development in the fruit. In the competitor states of Massachusetts, Wisconsin, and New Jersey, fruit must be harvested before color can fully develop; however, Wisconsin is seeing positive results from intensive efforts to develop varieties that mature in a shorter season.

Growers typically contract with first handlers to sell fruit steadily throughout the year. It is typical for growers to retain title to fruit until it moves



further into the marketing system. Oregon cranberries are relatively easy to sell because of superior color, but do not necessarily get top price. There are relatively small specialty outlets for fresh cranberries; increased sales have been observed in organic as well as conventional production systems.

After harvest, cranberry handlers wash, test for color and sugar content, size, chill, pack, and ship berries to processing plants, often out of state. Some independent first handlers have established local processing plants where the major focus may be drying berries into a raisinlike product in addition to juicing.

Besides its intense color, the Oregon crop is especially valued for its quality and concentration of soluble sugars. It is used primarily for juice, often mixed with paler juice from other regions to achieve ideal juice product color. Only about

2 percent of Oregon's production moves into fresh markets at present.

Before the popularity of cranberry-based juice drinks, this crop had only a 2-week-per-year demand cycle, in November. Research verifies the health benefits of pigment components in cranberries, which has drawn favorable attention and driven the development of new products. Increasingly, cranberries are used as an ingredient in baked goods, ice cream, and snack foods. Some in the industry predict that fewer berries will be sold for juice and more will be sold for these other processed products. If this trend continues, it may place a premium on larger berries.

Wine grapes

Oregon's wine industry has increased greatly in the past 15 years, and yet current demand for Oregon wines far exceeds supply. Since 1990, acreage has more than tripled, to nearly 12,000 acres harvested in 2005. The number of commercial, bonded wineries has increased to more than 300. The success of Oregon's wines is the result of an industry-wide desire for excellence and consistency over time.

Still, Oregon's wine industry is small in comparison to California's and Washington's. The largest Oregon winery produces 150,000 cases per year. By contrast, the largest California winery produces an estimated 75 million cases per year. Rather than attempting to compete in volume, the Oregon wine industry has secured its reputation by producing high-value, high-quality artisan wines. In contrast to a decade ago, greatest sales growth nationally is seen in smaller wineries, and consumer interest is increasing in hand-crafted wines, the only type produced here. Oregon also produces fruit and berry wines, though these have much less economic impact than grape wines.

Oregon's diverse climate supports 16 separate appellations, or identified wine-production areas. The Willamette Valley's cooler wet weather is suited to grapes from northern Europe such as Pinot Noir, Pinot Gris, Chardonnay, and Riesling. The warmer, drier growing regions south and east of the Willamette Valley produce those plus other varieties well suited to local conditions including Cabernet, Merlot, and Syrah. More than 90 varieties are grown commercially in Oregon. Many of these are "blending grapes," which contribute to the flavor and balance of finished wines. Industry

observers note that proposed changes to food labeling requirements may prove costly for the industry.

Wine production and sales are subject to federal, state, and local regulation. The federal standard permits a wine to be bottled as a varietal if it contains 75 percent of the named varietal. The Oregon standard has been 90 percent, with exceptions for seven varietals. These regulations have worked well for cool-climate grapes, which are not blended, but have posed difficulties for grapes in warmer climates, which are more likely to be blended.

Value added to wine grapes has greatly increased as wineries have invested significantly in processing, storage, bottling, and marketing. Oregon winery production often is too small to attract national distribution. Direct shipping of wine—through Internet sales, for example—has both benefits and problems, though some see it as the lifeblood of the industry. Compliance with the regulations can be complex, however, as every state has different rules regarding the receipt of wine shipments. Reporting can be expensive, time consuming, and restrictive.

The majority of Oregon's vineyards and wineries are small family businesses. Estate vineyards grow and process their own grapes; other wine producers buy grapes from various growers. Although wineries drive an impressive level of economic activity in the Oregon economy, independent vineyards and established wineries, like other agricultural enterprises, may struggle to break even.

In addition to agriculture, the *culture* of wine benefits Oregon's economy by drawing tourism dollars to the production areas. Wine tasting and culinary tourism go hand in hand and attract affluent tourists. Tourism expenditures related to wineries include direct wine sales, hospitality spending (hotels, restaurants), shopping, and spending in other recreational areas. Considering tourism associated with the wine industry in other regions of the United States, many in the industry conclude that Oregon can grow in this area.

Grape producers are challenged to promote ripening where the growing season ends with cool, wet weather. Oregon wine producers have eliminated past quality and consistency concerns by choosing

clones that develop full flavor under the growing conditions of their regions. Also, certain production practices maximize flavor components in grapes, thus enhancing product quality. For example, grape clusters are pruned to promote ripening and flavor characteristics, which has had a positive impact on the value of Pinot Noir grapes. However, pruning also reduces the supply of grapes that are in great demand, which increased the risk associated with smaller production and tight wine supplies. In particular, smaller volumes of wine open the possibility that retail stores' shelves will be empty part of the year. Wine sellers compete for shelf space in and are at risk from competing wine regions acquiring it.

Disease and pest pressures on this crop are significant. Powdery mildew, especially in cooler and wetter regions, is a perennial problem. Short shoot syndrome, caused by mite infestations, is a current concern throughout the state. Vole damage from vine girdling was a significant problem in 2005 when that population burgeoned.

The wine industry, at the small scale seen in Oregon, is labor intensive. Vineyard work is seasonal but requires skilled workers to plant, prune, harvest, and tend the crop throughout the growing season. In contrast to grape growing, winemaking is generally a year-round occupation. Core production teams, often family members, work from budbreak in spring through Thanksgiving. Wine grape production in central California includes precision agriculture and machine harvesting. Oregon's production scale does not justify mechanization.

Industry observers predict that "sustainable" production will become a driving force in the popularity of Oregon wines. While the average wine consumer isn't yet demanding sustainable production, some wine reviewers, wine shop owners, and restaurateurs are. Biodynamic, organic, and sustainable certification are options for Oregon producers, with a number of certifying and labeling organizations overseeing production standards. About one-third of Oregon wine grapes are grown under conventional production, indicating a smaller "environmental footprint" for this crop than for some others.



Vegetables



Farmgate sales of all vegetables in 2005 totaled almost \$378 million (Table 11, page 25), the third-largest commodity sector in Oregon agriculture. In 2005, about 35 commercial vegetable crops were reported, and many others were aggregated under “miscellaneous,” to protect proprietary information of growers and processors of minor crops. Of the 35 named crops, eight moved into processed markets, 15 were marketed fresh, and the remainder moved through both.

For this industry, value added is very high compared to farmgate sales. Overall, first handlers added about \$696 million, or 184 percent of farmgate sales. Value added ranged from 278 percent of farmgate value for processed snap beans down to 142 percent for onions.

Statewide, about 35 percent of value added was attributed to payroll and 21 percent to packaging-related expenses. Labor varies by commodity but is fairly intensive in preparing products for either fresh or processed markets. Processed products generally have higher packaging needs which include individual- and bulk-pack materials, case containers and related assembly materials, and labeling. This is in part because packaging is very important for maintaining product freshness and quality as it moves toward the consumer. Depending on the product, “other” value added includes facilities and related interest and operating costs (e.g., utilities and general maintenance; processing, sorting and assembly equipment; cooking materials; storage; transportation; brokerage, contract sales, or marketing management costs; taxes and association fees; administrative expenses; and general overhead).

Industry insights

Potatoes

Oregon’s potato acreage has slowly declined, to just more than 39,000 acres harvested in 2005. At one time Oregon production was third in the nation but now is fourth or fifth, depending on the year. That is due in part to boom-and-bust marketing: increased production brings relatively sharp price declines, to which growers respond by putting acreage into other crops. Demand for fresh potatoes is rather soft, given the trend toward less “from scratch” cooking at home. On the other hand, processed potato products move toward in-home consumption on a steady basis.

About 60 percent of Oregon’s potato crop is processed for a number of market outlets. The largest is frozen french fries and Tater Tot-type products. A much smaller share go into potato starch and potato chips. Some cull potatoes are moved into dehydrated, flaked, and granular products.



Processing potatoes are grown principally in eastern Oregon, typically under contract to first handlers. As a result, growers receive a more stable price but usually less than \$6/hundredweight. Most processing potatoes are “field run”; i.e., the processor accepts the crop in bulk, with no precise sorting or boxing. Thus, labor input for harvesting is relatively low.

Table 11.—Value added vegetables (2005).

| Commodity | Farmgate value (\$000) | Value added by first handler (\$000) | | | | Total value after first handler delivery (\$000) |
|------------------------------------|------------------------|--------------------------------------|---------------------|---------|---------|--|
| | | Payroll | Packaging materials | Other | Total | |
| Potatoes ¹ | 116,301 | 87,225 | 32,448 | 97,414 | 217,087 | 333,388 |
| Onions ² | 73,406 | 31,271 | 20,187 | 52,808 | 104,266 | 177,672 |
| Processed sweet corn ³ | 16,415 | 9,504 | 10,082 | 18,475 | 38,061 | 54,476 |
| Processed snap beans ⁴ | 22,832 | 19,910 | 16,919 | 26,723 | 63,552 | 86,384 |
| Other fresh & processed vegetables | 148,991 | 94,192 | 64,215 | 114,615 | 273,022 | 422,013 |
| Total | 377,945 | 242,102 | 143,851 | 310,035 | 695,988 | 1,073,933 |

¹ 23,316,356 cwt at \$5/cwt (weighted average price).

² 11,973,000 cwt at \$6.15/cwt (weighted average price).

³ 206,263 tons at \$79.60/ton (weighted average price).

⁴ 119,626 tons at \$190.85/ton (weighted average price).

About 40 percent of Oregon's potatoes, primarily from the Klamath Basin, go to fresh markets. Prices for fresh potatoes are quite volatile in a range that sometimes reaches \$30/hundredweight but may be as low as \$6/hundredweight. Contracts typically are not part of the fresh-market production process. Growers frequently serve as their own first handlers, though a number of sheds—some operating as cooperatives—store and pack fresh potatoes for growers. First handlers have high labor costs because fresh potatoes are thoroughly washed, then graded, sorted, packed, and shipped to wholesale and retail buyers. Packaging typically is designed to hold smaller weights, which increases handling requirements.

Demand is strong for early fresh potatoes, so there is incentive to move product early to receive whatever premium is available. In general, fresh-market growers are under pressure to have first handlers move their products, since fresh potatoes store well for only about 6 months though they are sold year-around. Optimal storage life also limits use of the strategy of holding fresh potatoes for a better price. The San Francisco terminal market is a major destination for Oregon fresh potatoes. From there, potatoes are shipped directly to retail markets.

Seed potatoes amount to less than 10 percent of Oregon's harvested acreage. Inspection and testing

are required for seed potato certification. To obtain certification, isolation of seed production areas is required.

Oregon lags behind Montana and Idaho in the production of potatoes for this market outlet, in part, because of the difficulty of establishing sufficient isolation within Oregon's potato growing regions. About 80 percent of Oregon's seed potatoes are stored on-farm under ambient conditions until sold prior to the next production season. The remainder are used on-farm.

Both fresh and processed potatoes are exported. Oregon and all U.S. potato producers create much more frozen potato product than domestic markets can consume. The Pacific Northwest states produce about 85 percent of U.S. exports. Though overseas processors have built in-country plants to process their own potatoes, exports of processed potatoes remain strong. Japan is the largest importer of Oregon processed-potato products. Mexico was considered an attractive frozen french fry market under NAFTA and now is second to Japan, followed by Canada, Korea, and China. Canada and Mexico lead in fresh potato imports, Canada importing about twice as many as Mexico.

Many in the potato industry are concerned about food fads and their impact on demand for potatoes. Industry marketing focuses on reminding



consumers that potatoes can be prepared in more nutritional and appealing ways than some fast-food presentations. Other market strategies include, for some growers, producing and marketing small specialty potatoes. Potatoes with colored flesh are beginning to sell to those interested in the health benefits of antioxidants. A network of Pacific Northwest land-grant universities and state potato commissions has pooled resources to develop and license new potato varieties. Some success has been achieved in breeding potatoes that need less water and fertilizer and are more pest resistant, and in developing new varieties that offer superior flavor, color, and shape.



Onions

Fueled by increasingly popular fast-food and ethnic cuisines in the late 1980s and early 1990s, U.S. onion consumption doubled, and demand outstripped production capacity. Today, domestic demand appears to be leveling off, creating price sensitivity to oversupply. Domestic onion production has shifted gradually over the past 10 to 15 years from the East to the West Coast, due to such factors as better yield and quality. Washington's onion acreage increase is more than double Oregon's. Most onions produced in this region are Spanish types with intermediate pungency; they are not as hot as onions produced in other regions. With the exception of the Walla Walla area of Washington, sweet onions are grown only in southern states.

Processor demand for larger onions has increased the past 20 years. Processors typically pay a premium for larger onions, which reduces handling per unit of weight. Genetics and management practices are at the heart of large-onion production. Large onions require a critical soil water

level. Soil moisture fluctuations stress onions, resulting in reduced yield and double or triple centers. Breeding trends are toward larger, and to some extent sweeter, bulbs.

Growers of dry storage onions typically sell directly to processors and fresh shippers. Most onions are sold on the open market, but increasingly onions are grown under contract production for processing. In some cases, smaller processors buy from shippers rather

than contract with growers. Before shipping, onions are typically sorted by grade, quality, and size. The onions then are packed for shipping to wholesalers, retailers, and food-service providers.

Storage onions are topped while in the ground then windrowed in the field for about a week. Then they are loaded onto trucks and moved directly into storage. Cleaning and sorting begins off-field. On-farm storage is not sufficient to handle all production. Processors also provide storage, and some onions move directly from the field onto processing lines. Shipping may be handled by growers or by independent shippers. Many fresh shippers have storage and also provide cleaning, sorting, and boxing services. Temperature and humidity controls extend the quality of the crop in storage and discourage development of disease organisms.

Onions are processed into many products. Common ones include onion rings, chopped and diced onions, IQF onions, and "peelers," which are onions prepared and shipped whole to fast-food businesses as well as other food processors. A strong new market has developed for processed "blooming" onions; restaurants have a high demand for these artfully cut and breaded onions, to be cooked as appetizers.

Corn, snap beans, and other processed vegetables

In the early 1990s, value-added estimates were reported for 11 processed-vegetable crops plus a variety of miscellaneous vegetables. For 2005, reporting on six of those crops had to be rolled into a miscellaneous category due to confidentiality rules (see “Proprietary information,” page 2), and there was only a single processor in Oregon for each of five vegetable crops. Snap beans and sweet corn are the most widely grown table vegetables for processing in the state, but most county-level estimates are confidential since only one or two growers or processors handle them.

Processed-vegetable production has declined in Oregon for a number of years. Some processors have gone out of business; others have moved out of state. As of 2005, only about a dozen traditional processors had production contracts in Oregon, and five of those had part or all of their processing operations in Washington or Idaho.

While acreage has declined, yields and grower prices for the major processing vegetables have trended upward modestly over time. The result has been a slight increase in farmgate sales. However, both growers and first-handler processors state that they are being realistic about rising production costs and about their occasional vulnerability

in wholesale markets which have soft prices from time to time.

Traditional processors still in business are optimistic about their future in Oregon. They have maintained their operations and developed stable market outlets for their products, which benefits Oregon growers. Some larger growers have developed niche markets and relatively small processing operations to meet those markets’ needs.

Fresh-market vegetables

Overall, fresh vegetable growers and first-handler operations have increased steadily over the years. Their market outlets are well-established, and prices have trended upward. Sales in the organic sector—through all marketing venues and in farm-direct sales through farmers’ markets and roadside stands—have increased steadily since the 1990s as consumers respond to health- and quality-conscious eating trends.

Sweet corn, tomatoes, and squash and pumpkins, the leading fresh vegetables in Oregon, generally have experienced increased acreage and increased production, along with strengthening prices over the past 15 years and especially since 2000.



Grains



Oregon growers produce wheat, barley, corn for grain (in contrast to sweet corn), oats, rye, and other miscellaneous grains. Production of wheat, traditionally one of the highest paying crops for Oregon growers, has increased slightly in recent years. In 2005, wheat ranked fifth in sales for all crops. In 2005, Oregon wheat growers produced an estimated 52 million-plus bushels on more than 855,000 acres. For all grains, growers received about

\$199 million in 2005 (Table 12, page 29), a drop of almost 6 percent from the early 1990s. This decrease was due to reduced wheat prices and to the lower overall production of wheat, barley, and oats.

Corn for grain was a relatively minor crop for many years, but has increased recently in acreage and farmgate value; in 2005, growers received just less than \$12 million for 25,000 acres of corn. That is more than a 110 percent increase in acreage and almost a 240 percent increase in cash receipts compared to the early 1990s.

Several market conditions have contributed to this increase in field corn. When “mad cow disease” was found in Canada, the United States banned Canadian beef imports. The resulting increased demand and higher prices for U.S. beef increased demand for feed. Low wheat prices relative to corn prices likewise encouraged an increase in corn production. Finally, and more recently, the interest in production of ethanol and other biofuels has stimulated field corn production.

Barley acreage and farmgate value have gone down steadily. In the early 1990s, barley sales were just over \$19 million from 125,000 acres harvested; in 2005, growers received just under \$12 million from 70,000 acres. Oats is a relatively minor crop in Oregon. Rye and some other minor grains are included in the “other grains” category in Table 12.

First handler costs continue to increase. Total value added by first handlers was just under \$41 million, almost 21 percent of farmgate value. Wheat, the predominant grain, benefited from just over 20 percent value added in 2005. The high was just over 37 percent for relatively low-value-per-bushel oats and just over 6 percent for relatively high-value-per-bushel miscellaneous grains.

The values added in Table 12 include a typical \$0.10/bushel handling charge which includes labor, utilities, and returns on investment to the grain elevator. Prorated barge, rail, and truck transportation from selected regions make up the transportation value added. With the exception of the \$0.03 per bushel assessment paid by each first handler to the Oregon Wheat Commission, storage is the “other” value added to grain. A typical storage charge was \$0.02 per month per bushel for 3.5 months. Grain storage time depends highly on marketing strategies by first and second handlers and on the availability of transportation and storage. Grain elevators may hold on to a portion of the harvest, if there is the possibility of a higher price in the future.



Industry insights

Of the six classes of wheat, four are grown in Oregon—hard red winter wheat, hard red spring wheat, hard white wheat, and soft white wheat. Some 90 percent of Oregon’s crop is soft white. U.S. production of soft white winter wheat is concentrated in the Pacific Northwest. Soft white wheats have a lower

Table 12. Value added grains (2005).

| Commodity | Farmgate value (\$000) | Value added by first handler (\$000) | | | | Total value after first handler delivery (\$000) |
|--------------------------------|------------------------|--------------------------------------|----------------|--------------------|--------|--|
| | | Handling ¹ | Transportation | Other ³ | Total | |
| Wheat ² | 171,248 | 17,125 | 12,587 | 4,879 | 34,591 | 205,839 |
| Barley ⁴ | 11,739 | 462 | 2,170 | 324 | 2,956 | 14,695 |
| Oats ⁵ | 3,095 | 181 | 848 | 127 | 1,156 | 4,251 |
| Corn ⁶ | 11,855 | 458 | 1,362 | 320 | 2,140 | 13,996 |
| Rye & other grain ⁷ | 703 | 10 | 26 | 7 | 43 | 746 |
| Total | 198,640 | 18,236 | 16,933 | 5,657 | 40,886 | 239,526 |

¹ Includes labor, utilities, and capital.

² 48,788,544 bu at \$3.51/bu (statewide price).

³ Typical storage is 3.5 months for grain; wheat includes Oregon Wheat Commission assessments.

⁴ 4,621,698 bu at \$2.53/bu (statewide price).

⁵ 1,809,655 bu at \$1.71/bu (statewide price).

⁶ 4,577,400 bu at \$2.59/bu (statewide price).

⁷ 102,485 bu.



protein content and perform well in noodles, crackers, cookies, and cakes.

Hard red winter wheat, used in breads, is the most widely grown and commercially used wheat in the United States. In Oregon, the hard wheat classes are grown mostly in the central and eastern regions. Acreage of hard red winter wheat recently has increased slightly due to higher prices. The price for hard red winter wheat is highly dependent on protein content. Growers assume a greater risk when planting hard red winter wheat due to higher input costs and unpredictable weather conditions.

In Oregon, grains are generally grown without a contract. The value of wheat varies by class, by protein content (which varies within classes), and by how free it is of foreign matter. Usually, growers truck their grain to a local grain elevator, though Willamette Valley growers truck their grains directly to the Port of Portland. Elsewhere, the grain elevator pays for storage and transportation to the Port or other locations and may do some cleaning to avoid price discounts for foreign matter. First handlers ship much of the grain to the

Port by river barge or by rail. First-handler prices at the Port vary with logistics related to storage capacity and the availability of cargo ships and moorage in the Port. Whenever the price paid to the first handler is reduced or increased, the change is passed along to the grower. In some cases, wheat growers own their own local grain elevators and act as first handlers, serving some smaller farms. Distance from the Port has a large impact on the price paid to growers.

Oregon has exported about 85 percent of its wheat production in the past few decades. In Portland, the primary focus of second handler grain elevators is filling international grain contracts; grain is transported by cargo ships to Asia, South America, and beyond.

Value added to grain crops is relatively small but growing. There is some wheat milling in the state, which adds a level of value. The cost of doing business is about the same for most grain elevators, and the cost of handling is about the same for any grain crop and is completely independent of the grain's farmgate value. Thus, the ratio of value added to farmgate values is lower for higher value grains.

Forage



In 2005, total production of alfalfa and other hay species in Oregon amounted to just over 2.2 million tons. Increased production and improved prices led to 2005 farmgate sales of about \$218 million (Table 13, page 32). Since the late 1990s, production and value of grass and grain straw have increased greatly as markets, especially international markets, have grown. In addition to hay and alfalfa receipts, it is estimated that

straw producers grossed about \$26.6 million from the 2005 crop. Silage and miscellaneous forages had gross farm sales of about \$13.5 million in 2005.

Industry experts typically identified value added in four categories: payroll, packaging and materials, transportation and handling, and “other.” Packaging and materials included harvesting expenses and, for many crops, some form of baling and wrapping. Transportation and handling frequently included storage. “Other” expenses included overhead, management charges, utilities, accounting, license expenses, and fees.

As a whole, first handlers are estimated to have added about \$93.4 million to the forage sector in 2005, roughly 36 percent of farmgate value. That is a significant increase over amounts noted in the past; the increase is related to straw exports. A little more than 33 percent of value added was in transportation and handling; the lowest contributor, 16 percent of total value added, was processing and packaging.

Total value-added percentages varied considerably among the subsectors. Grass and grain straw, a relatively low-farmgate-value commodity, had 44 percent value added. In contrast, value added for silage and other hay commodities was only 24 percent above farmgate value and mostly related to harvesting and assembly costs. Farmgate value and first-handler value added to silage are quite limited in Oregon because silage is a high-moisture, relatively low-value product and frequently is used on the farm that produced it.

Industry insights

In the forage sector, the definition of first handler depends in part on whether the grower has shipping services available. Hay might be baled and stored on-farm, under cover or in the open, and then sold directly to livestock and dairy operators who take title to the hay at the grower’s and haul it to their own sites. Or, the grower might contract with shippers but retain title and risk until delivery to the buyer. In some cases, hay merchants buy and resell hay from first handlers. In other cases, first handlers contract with brokers who do not buy the hay but arrange sales and shipping.

The value of hay products centers on harvest timing, storage environment, and market identification and timing. Stage of maturity, moisture content, bale configuration, wrapping materials, and compression techniques all may add value if done properly and if first handlers target the right buyers. Low-quality, high-fiber forage can be processed by shredding, mashing, or grinding techniques to improve digestibility, but those processes don’t improve nutrition quality. Molasses may be added to these forages to improve palatability. Pelleting, cubing, and wafering make bagging, shipping, and feeding more convenient.

Weather is critical in hay production. After cutting, rain at the wrong time can leach nutrients and increase drying time; mold reduces hay quality. The first hay cutting typically has lower quality because it might include stubble left from the previous season. Three or four cuttings per season are common; a fifth cutting may be possible if market conditions and season length warrant the additional harvest.

Hay sometimes is sprayed with desiccants such as potassium carbonate to facilitate drying or, less commonly, with preservatives, typically propionic acid. Preservatives prevent spoilage, thus allowing hay to be baled at higher moisture content. These methods are used when drying conditions are not optimal and ensure a higher quality product without risk of fire and mold or other quality reduction.

Identifying and maintaining hay quality during shipping is critical for repeat sales. Trust is an issue for forage buyers, and subjective quality evaluations can be important. The marketing process, however, increasingly involves quantifiable laboratory analyses.

One-ton rectangular bales are efficient to ship but require special cutting equipment to process for livestock feed. Round 800-pound bales pack inefficiently, so typically are used on-farm or are shipped only short distances. Traditional-size bales of 75 to 120 pounds more typically are sold by first handlers direct to retail or to noncommercial farmers and ranchers in urban–rural interface areas.

The beef cattle industry uses higher fiber forages. Beef animals require lower nutrient levels to produce a pound of beef than a dairy cow requires to produce a pound of milk. In Oregon, horse owners' demand for quality grass hay can be a significant segment of the hay industry. The monogastric equine stomach requires higher quality material for adequate nutrition than the compound bovine stomach.

A very significant amount of hay is grown for use in the dairy industry. Dairy

users increasingly focus on hay quality and may favor dependable sources of high-quality hay without regard for location. The trend now is to increase hay quality by harvesting alfalfa earlier. The result is more digestible and less fibrous hay with a higher protein content. As Oregon dairy size increases, more efficient means of harvesting, storing, and shipping hay are being encouraged.

Increasingly, producers, first handlers, and end users facilitate hay and straw sales through specialized websites, some of which are maintained by growers' associations. A limited amount of hay is sold in international markets.

Straw is a byproduct of cereal grain and grass seed production. Oregon growers are beginning to manage straw as a resource rather than as a waste product. In animal feeds, grass seed straw is the basis for feed mixes; Asia has developed a strong market for these products. Domestically, cereal straw is used in the mushroom industry and for animal bedding. Straw is used for soil conservation (along highways, for example), as stall bedding, and as a portion of some livestock rations. There is increasing interest in straw gasification as a power source, although at this time the United States has no commercial-scale process for that. See "Seed Crops," page 33, for a discussion of trends in burning grass-seed and other straws.

Perhaps as much as 40 percent of grass seed acreage in the southern Willamette Valley now is managed under a system known as full-straw-load. In this system, straw is chopped and returned to the field. Some grass seed species grow through the mulch and benefit from the improved soils. As a mulch, straw also suppresses weeds; however,



organic mulches also absorb herbicides and reduce their efficacy. Baling cleans the soil mechanically but not as effectively as burning.

Custom harvest and baling services increasingly are available to growers. Though it is still common for the grower to give straw to the harvester at no cost, custom harvesters sometimes pay growers for it. As market prices for straw improve, the practice of paying growers may become more common. If straw is stored on-farm, the custom harvester often pays the farmer for insurance and rent and may share the cost of storage structures, which protect product quality. Some straw storage has been developed using subsidized funding under Oregon field-burning laws.

Straw is exported year-round. However, as growers manage straw on the field, tonnage available for export declines. In recent years, infrastructure for straw exports, such as compressors and shipping containers, has increased significantly. Very little straw is stored at compressor facilities; generally it is warehoused at the producer's.



Efforts to open grass seed straw markets have been exceptionally successful in Asia, where rice straw often is readily available but is less nutritious than grass seed straw. Japan and Korea have increased their domestic meat and dairy industries with the increased availability of Oregon straw, which is blended with more nutritious feeds to create complete rations. Despite competition from China and Australia, Oregon straw exports to Asia more than doubled from 1997 to 2005, from about 330,000 tons to almost 670,000 tons.

Japan, which receives about 60 percent of Oregon's straw shipments, carefully monitors imports to ensure standards are met. First handlers of export straw are under strict phytosanitary restrictions and limits for insects, rodent droppings, and soil content. The Oregon Department of Agriculture and, to a lesser extent, the U.S. Department of Agriculture test and certify straw leaving Oregon.

No export value has been put on wheat straw. USDA programs in Oregon and other northwest states have developed management strategies for wheat straw residue which can reduce erosion in steeply sloped dryland production areas.

Table 13. Value added forage crops (2005).

| Commodity | Farmgate value (\$000) | Value added by first handler (\$000) | | | | | Total value after first handler delivery (\$000) |
|------------------------------------|------------------------|--------------------------------------|----------------------------------|---------------------------|--------|--------|--|
| | | Payroll | Processing & packaging materials | Transportation & handling | Other | Total | |
| Hay ¹ | 218,015 | 18,052 | 9,418 | 29,040 | 21,976 | 78,486 | 296,501 |
| Grass & grain straw ² | 26,646 | 1,759 | 4,104 | 3,518 | 2,345 | 11,726 | 38,372 |
| Silage & other forage ³ | 13,540 | 636 | 1,114 | 859 | 573 | 3,182 | 16,722 |
| Total | 258,201 | 20,447 | 14,636 | 33,417 | 24,894 | 93,394 | 351,595 |

¹ 2,202,780 tons at \$99/ton (weighted average price).

² 593,038 tons at \$44.80/ton (weighted average price).

³ 554,961 tons at \$24.40/ton (weighted average price).



Grass and legume seed crops had farmgate sales of more than \$373 million in 2005, the second largest agricultural production sector in Oregon. That included perennial ryegrass sales of almost \$147 million, almost 40 percent of the total, and tall fescue sales estimated at about \$109 million, 29 percent of total seed crop sales. The remaining 18 commercial seed crops in Oregon totaled \$118 million in farmgate sales. These include alfalfa, orchardgrass, various clovers, bluegrasses, and nitrogen fixers such as vetch (Table 14, page 34).

First handlers typically reported value added in three major categories: payroll, processing and packaging, and “other.” Processing and packaging included cleaning, blending, and packaging. “Other” value added includes storage, transportation, marketing and management charges, and overhead.

Value added amounts are similar for all seed types. On average, about 40 percent of added value was in payroll; “other” value added was 41 percent; and processing and packaging was almost 20 percent. In 2005, first handlers added just over \$76 million to Oregon seed crops, about 20 percent of farmgate value.

Industry insights

Grass, alfalfa, and clover seed are the principal seed crops in Oregon. The Willamette Valley is particularly suitable for seed production and supplies about 70 percent of the world’s grass seed. Market expansion and price improvement have contributed to significant increases in grass seed acreage in the Willamette Valley over the past 20 years.

About 20 percent of Willamette Valley production fills the demand for homeowner lawns. Japan, Korea, and China, which lack good seed-growing areas, are increasing their imports of grass seed. Some U.S. seed companies have opened offices in these countries, traditionally a requirement for strong business relationships in Asia. Approximately 10 percent of perennial ryegrass and tall fescue seed production in the Willamette Valley is for livestock forage. More than 50 percent of the annual ryegrass seed crop and nearly 100 percent of the orchardgrass seed crop are used in forage production.

In the past 20 years, use of tall fescue for turf has increased greatly. Before, it had been grown primarily for pasture and hay. Turf-type varieties of tall fescue now make up 85 percent of Oregon’s tall fescue seed crop. These varieties are valued for turf because they stay green with little fertilizer and limited irrigation. A relatively strong economy, with more housing starts and golf course development, provided a solid foundation for expansion of the perennial ryegrass industry.

Innovations in no-till crop production have created markets for Willamette Valley annual ryegrass seed. This variety is increasingly used as a cover crop in Midwest soybean and corn production. It improves soil quality by reducing erosion and nitrogen leaching, by suppressing weeds and other pests, and by depositing organic matter in the soil. The industry expects annual ryegrass sales to increase.

Clover seed production and marketing has changed in the past decade as white clover production shifted from California and New Zealand to the Willamette Valley. White clover has become more attractive to Oregon producers as a rotation crop which also draws high farmgate prices. New Zealand and California growers are producing other crops which provide them with higher profit margins. Harvested

acreage of white clover seed has increased by a factor of six in Oregon, to 6,250 acres harvested in 2005.

Some seed companies hold proprietary rights to specific grass seed varieties and contract with growers, paying by the pound for production. Approximately 30 percent of perennial ryegrass acreage is under production by growers who belong to a bargaining association. The association negotiates prices with dealers, under the supervision of the Oregon Department of Agriculture. This gives the dealers antitrust protection while facilitating price discovery, data sharing, and negotiated pricing opportunities for growers.

In some cases, growers retain title to the seed while first handlers provide cleaning, packaging, storage, transportation, and brokering. Some buyers take title and transport seed from the first handler's warehouse. Other growers are integrating vertically, developing their own handling facilities and all necessary value-added elements of cleaning, seed prep, packaging, storage, transportation, and marketing to the wholesale or retail level. Today, 5 to 10 percent of the harvest is moved this way, and the trend is increasing.

Alfalfa seed producers typically contract with first handlers and haul seed to first-handler locations. Many of the other seed crops are *open market*; that is, they are produced without a contract or prior first-handler arrangements.

Postharvest seed treatments may include application of fungicides, insecticides, micronutrients, and inoculants—all considered cheap insurance against loss due to insect or disease problems in storage or after planting. In alfalfa production, seed treatments may be lime-based, which increases seed size and facilitates handling.

Growers usually are paid on the clean weight price and are docked for contaminated seed. The cleaning process removes weed seed and other foreign material. Seed is tested and, if it meets standards, is eligible to be certified. Though certification brings higher prices for some seed, it requires more careful and costly production and handling. It must be grown in isolation from "foreign" seed pollen and must be inspected periodically in the field and tested in the laboratory for purity of type and other quality indicators. Certification and other markers of quality facilitate marketing Oregon grass seed in U.S. and international markets.

Sometimes seed is shipped internationally in totes; however, most seed is packaged in 25- or 50-pound bags. Rebagging and blending prior to retail distribution is very common; and seed is bagged with store or other brand labels.

Field burning, although tightly controlled by the Oregon Department of Agriculture and on greatly reduced acreage, is still a management tool for some. Burning extends field productivity by reducing plant diseases, insect pests, weeds and their seeds, residues, rodent populations, and (in some species) by increasing seed yields; it also returns plant nutrients to the soil as ash.

Field-burning restrictions have encouraged seed and grain producers to harvest field residues for sale as straw. Other effects have been an increase in herbicide use, particularly in grass seed fields, and increased fertilizer use, both of which add to grower costs. Removing straw from the field removes the nutrients it contains; potassium shortages and associated yield reductions have been noted for some grass seed species.

Table 14. Value added seed crops (2005).

| Commodity | Farmgate value (\$000) | Value added by first handler (\$000) | | | | Total value after first handler delivery (\$000) |
|--|------------------------|--------------------------------------|----------------------------------|--------|--------|--|
| | | Payroll | Processing & packaging materials | Other | Total | |
| Perennial ryegrass ¹ | 146,510 | 11,469 | 6,813 | 10,390 | 28,672 | 175,182 |
| Tall fescue ² | 109,197 | 9,505 | 3,789 | 10,468 | 23,762 | 132,959 |
| Other grass & legume seed crops ³ | 117,783 | 9,450 | 4,239 | 9,889 | 23,578 | 141,361 |
| Total | 373,490 | 30,424 | 14,841 | 30,747 | 76,012 | 449,502 |

¹ 2,675,660 cwt at \$54.75/cwt (weighted average price).

² 2,191,580 cwt at \$49.85/cwt (weighted average price).

³ Includes alfalfa seed; colonial and creeping bentgrass; Kentucky bluegrass; *Poa trivialis*; arrowleaf, crimson, red, and white clover; hairy and common vetch; Chewings, hard, and red fescue; annual ryegrass; orchardgrass; all wheat grass; and miscellaneous grass and legume seeds.

Ornamental crops



Ornamental crops include Christmas trees and nursery, greenhouse, and other specialty crops. The specialty ornamental crops, which have relatively small farm-gate sales, include bulbs and turf sod. Total farmgate value for all ornamental crops in 2005 was estimated at about \$980 million (Table 15, page 37). Of that, 87 percent was attributed to nursery, greenhouse, and specialty ornamentals.

Assessing production versus first-handler functions is a challenge when reviewing industry data. The difference between production and first-handler activities is not well defined in many agricultural industries, but nowhere less so than in nursery and greenhouse commodities. In some cases, certain parties clearly provide first-handler services; but some growers, especially larger ones, are vertically integrated and don't separate production from marketing and other business activities.

Estimates of value added for all ornamental crops in 2005 are \$153 million or almost 16 percent above farmgate sales. About 37 percent of the 2005 value added was for labor, which is used extensively in both production and first-handler activities. "Other" value added was 58 percent; the remainder was for packaging. Packaging for nursery, greenhouse, and specialty ornamentals consisted of containers, soil materials, labeling, assembling, and wood and plastic materials for shipping boxes and flats. For Christmas trees, packaging primarily included packing trees and wreath materials for harvest and shipping. "Other" types of value added varied depending on the commodity. They included temporary and permanent storage facilities, short-distance hauling, freight charges, distribution, general administration, utilities, insurance, taxes and fees, and general overhead.

Industry insights

Nursery and greenhouse

The ornamentals industry is the largest single agricultural sector in the state. Annual sales have increased significantly since at least 1980. Diversity also characterizes the industry: nursery and greenhouse operations are exceedingly diverse in organization and products, and the diversity of species grown in Oregon is one of the industry's major strengths. New varieties help drive market demand.

Industry leadership, a strong reputation for quality products, and innovative production practices also are competitive strengths for Oregon. Further, Oregon continues to have a competitive advantage in producing and marketing ornamental trees. The climate produces larger trees in fewer years and produces ornamental shrubs hardy enough to ship to distant markets in cold weather without freeze damage. Value-added margins on the whole have remained fairly constant in this part of the industry.

As demand for container stock has increased so has the number of producers; however, not many field growers are converting to containers. Container production is more expensive but allows for





efficiencies in shipping. Shipping from the West Coast to eastern markets is expensive, and careful temperature and humidity control is needed inside trucks, but containers are very saleable.

Many Oregon operations are liner nurseries: fields contain rows (lines) of plants in small pots or 1- or 2-year-old bare-root trees, all of which are grown to a finished stage. Some 60 percent of this product is shipped east of the Rockies. Nurseries often lease land to increase production.

Greenhouse crops include bedding plants, annual flowers, herbaceous perennials, hanging baskets, houseplants, poinsettias, fuchsias, and Easter lilies and other forced plants. Grown under production schedules, they usually are not shipped very far due to quality concerns and high shipping costs. Some go to retailers in Washington and northern California; forced azaleas are distributed to florists as far away as Canada.

The wreath industry is significant in Oregon but highly seasonal. Oregon also produces some cut flowers. Much of the production is sold through brokers who organize distribution in traditional small lots. The grower frequently provides first-handler services to florists and floriculture distributors.

Some ornamentals producers are vertically integrated, from production of the initial plant materials to delivery of finished products to retail distributors; for them, production is a multiyear process. Others may buy products—bare-root, container, or both—grow them for a year, and sell everything at the end of that period. Some growers specialize in contract-growing for other growers and then ship to distributors. Annuals and herbaceous perennials have a short production and marketing window.

While some nurseries grow on contract for a broker, there is little cooperative marketing in the nursery and greenhouse industry. However, some nurseries have sales people in midwest and eastern markets, some of whom represent other nurseries in a relationship similar to a brokerage. Large retail chains typically dictate orders, timelines, and wholesale costs to first handlers. First handlers subcontract with smaller growers, then deliver the

product to the retailer with packaging and appropriate bar codes in place. Typically, nurseries and greenhouses grow the plants and then provide a marketing program including customer service, delivery, and information and training sessions for customer employees.

Mechanization in the nursery has increased over the past 15 years in response to increasing labor expenses, even though a large percentage of it is at minimum wage. Periodic increases in the legal minimum wage are a general industry concern. The industry has invested heavily in capital improvements such as potting and trimming machines, assembly facilities for containers, and transportation systems.

Some grower and first-handler margins are a bit better today because their techniques are more efficient. However, there are limits to the improvement that can be achieved in hand labor and to the efficiencies that can be achieved through mechanization, given present technologies.

Freight and fuel cost increases also are industry concerns; in response, industry leaders have encouraged cooperative shipping.

Plant diseases, invasive plants, and environmental problems such as water quality are major concerns to the industry and put more emphasis on detection, monitoring, and certification. Oregon Department of Agriculture's Plant Division and Commodity Inspection Division provide invaluable guidance in these areas. Quarantines are necessary at times to reduce the spread of problems, but they also constrain trade. As the world economy globalizes, industry observers see those pressures increasing. Industry helps to lead on water-quality programs, to ensure adequate supplies for ornamental crops and to control waste-water runoff.



Growers in many states compete with Oregon nursery producers, but the threat of competition from southeastern tobacco growers is of particular concern. Many growers are transitioning from tobacco production; nursery and

greenhouse crops have been identified as high-value enterprises that could sustain these smaller farms. If these growers are able to produce high-quality products, they will have a decided advantage in shipping to Oregon's primary markets in midwestern and eastern states.

Christmas trees

Oregon produces one-third of the U.S. Christmas tree crop on plantations that are heavily concentrated in the Willamette Valley. Eight to 10 large growers dominate in Oregon, but there are many smaller growers. Retail and distribution chains provide a market for larger growers. These retailers prefer to do business with one large shipper. Some smaller growers may combine their efforts to attract larger customers.

Christmas tree production is a 7- to 10-year investment. They typically are grown for the cash market; however, some are successfully grown on contract for other growers or for shippers. Growers sell 10 to 20 percent of their trees directly. Sales may be a local retail lot, or growers may ship trees to lots that they operate in Oregon or other states. Many small growers sell their trees directly to consumers through U-cut operations.

Wreath and related greenery businesses can be important to growers of all sizes; some have created significant operations. These require growing or buying at wholesale the fir and cedar foliage and other forest products.

Ninety-two percent of Pacific Northwest trees are sold outside their state of origin. Exports are significant to Pacific Rim nations and Mexico—almost 25 percent of Oregon’s Douglas-fir Christmas trees go to Mexico—but California remains Oregon’s major market.

Harvest by some of the larger operators involves transportation from distant and isolated growing locations. A wide variety of larger growers use helicopters to move trees from growing areas to

receiving stations. Christmas trees may be shipped by rail to more distant markets; climate-controlled cargo containers are typically used for Pacific Rim shipment.

Shippers mix tree varieties to order. This facilitates offloading at distribution centers or retail outlets. Trees frequently are netted or baled and on occasion are palletized. Demand for specific tree varieties appears to be very regional.

A basic marketing cost, especially for export markets, is inspections and phytosanitary certificates to ensure trees are free from insect pests and disease. Most of these costs are relatively small.

Costs related to container shipments to Pacific Rim countries may be significant, but that added value does not impact the Oregon economy directly.



Table 15. Value added ornamental crops (2005).

| Commodity | Farmgate value (\$000) | Value added by first handler (\$000) | | | | Total value after first handler delivery (\$000) |
|--|------------------------|--------------------------------------|-----------|--------|---------|--|
| | | Payroll | Packaging | Other | Total | |
| Nursery, greenhouse, & specialty ornamental crops ¹ | 853,507 | 46,768 | 6,330 | 71,749 | 124,847 | 978,354 |
| Christmas trees | 126,436 | 9,690 | 1,151 | 17,443 | 28,284 | 154,720 |
| Total | 979,943 | 56,458 | 7,481 | 89,192 | 153,131 | 1,133,074 |

¹ Specialty ornamentals include bulbs, turf sod, and miscellaneous.

Field crops



Farmgate sales for field crops in 2005 were estimated at about \$86.8 million. Major crops included peppermint for oil at almost \$26 million, hops at \$20.5 million, and sugarbeets for sugar at \$12.4 million (Table 16, page 39). Other field crops, totaling an estimated \$27.9 million, included spearmint, dill, and canola for oil; dry field peas and beans; and seed crops that included sugarbeets, radishes, mustard, vegetables,

and flowers. (Potatoes are discussed in “Vegetables,” page 24; grass and forage seed are discussed in “Seed Crops,” page 33.)

Value added to field crops in 2005 was estimated to total \$16.1 million, an increase of 18.5 percent over farmgate value. In this sector, most of the value added is beyond first-level processing. Value-added typically reported by first handlers of field crops were payroll, processing and packaging, and “other.”

Mint processing and storage includes transportation from the farm to the first handler. Other value was added in transporting oil to refiners in the upper Midwest and East. Value is added to mint oil through transportation, chemical analysis, blending, warehousing, and other distribution functions. Buyers often continue the analysis and blending process at their facilities.

Hop production is labor intensive during spring production and, later, harvesting the hop cones and curing and baling them for shipment to breweries and other retail buyers. On-farm packaging usually is in 200-pound bales. Postharvest processing frequently includes pelletizing and, within the past 10 years, extracting bittering acids. “Other” hop value added typically was overhead, harvesting, curing, and packing equipment along with storage sheds, utilities, storage, and insurance.

Large-scale processors of sugarbeets have left Oregon, so processing and packaging value added in 2005 was primarily assembling at receiving stations and initial cleaning. “Other” includes short-term storage and shipping to a sugar-processing plant in Idaho.

Essential oils, such as from mint and dill, are extracted by distillation. Oils made from seeds such as canola, meadowfoam, sunflower, and safflower are extracted by solvent or mechanical methods. Meadowfoam oil is extracted out of state. Seed oils are important food products; meadowfoam principally is used in cosmetics.

Pacific Northwest production of oilseed crops is less than in some other states. Anticipating increased demand for biodiesel or other seed oil uses, the first seed oil crushers have been established in Oregon.

Industry insights

Mint

In the past, Oregon was considered the “crown jewel” of mint production worldwide. The soils, climate, and other growing conditions allowed the Willamette Valley to produce uniquely superior mint oil with exactly the characteristics manufacturers sought. Mint also has been produced in central and eastern

Oregon; each region's product has unique quality attributes. Advances in flavor chemistry now permit blending Oregon oils with lower quality oils from other regions. The Oregon industry has experienced sluggish conditions and rather flat prices since the late 1990s; as a result, mint acreage in the Willamette Valley is about 65 percent less than it was in the early 1990s.

Growers in central Oregon now produce whole, dried mint leaves for the tea market. Ninety percent of Oregon mint leaves for tea are exported to Europe, and the rest is consumed domestically. Tea is less lucrative than the oil market, but international competition has reduced demand for Oregon essential oils and eliminated the oil contracts that growers once enjoyed. Mint for tea brings a better price than dryland wheat, the likely alternative crop.

Mint production has become marginal for many growers throughout the state because labor and fuel costs have increased dramatically while farmgate prices have stagnated. Some producers and first handlers stay in the business because they have established markets and they use older, fully depreciated farming and processing equipment. However, long-established growers are beginning to leave the industry in favor of more lucrative enterprises. New operations likely would be uneconomic.

Some growers produce mint for oil on 2- to 3-year contracts with manufacturers. An average oil yield is 90 pounds/acre; some regions produce significantly more. Growers receive \$8 to \$28/pound, depending on contract terms.

At a weighted average price of \$12.80/pound of oil in 2005, growers struggled to achieve full returns for grower labor, management, and capital. Some growers at this time believe \$15/pound is the minimum for a positive economic return—and that it still is hard to make a living at \$15/pound. Weighted average estimates of farmgate prices for mint oil in Oregon have been below that since the mid-1990s. As margins narrow, grass seed and vegetable production become attractive alternatives.

Table 16. Value added field crops (2005).

| Commodity | Farmgate value (\$000) | Value added by first handler (\$000) | | | | Total value after first handler delivery (\$000) |
|-----------------------------------|------------------------|--------------------------------------|------------------------|-------|--------|--|
| | | Payroll | Processing & packaging | Other | Total | |
| Peppermint for oil ¹ | 25,975 | 2,205 | 731 | 1,123 | 4,059 | 30,034 |
| Hops ² | 20,488 | 3,101 | 1,602 | 935 | 5,638 | 26,126 |
| Sugarbeets for sugar ³ | 12,438 | 292 | 19 | 295 | 606 | 13,044 |
| Other field crops ⁴ | 27,903 | 3,761 | 1,208 | 820 | 5,789 | 33,692 |
| Total | 86,804 | 9,359 | 3,560 | 3,173 | 16,092 | 102,896 |

¹ 2,027,340 lb at \$12.80/lb (weighted average price).

² 7,972,000 lb at \$2.55/lb (weighted average price).

³ 315,000 tons at \$39.50/ton (weighted average price).

⁴ Includes spearmint, dill, and canola for oil; dry field peas and beans; sugarbeets, radishes, mustard, vegetables, and flowers for seed; and miscellaneous field crops.

Mint is a perennial crop. In the past, it was not uncommon to harvest a single planting for 25 years; now, a field is harvested for 5 years. Mint fields may be “double harvested,” or cut twice per year, though this reduces the strength of the stand and requires more fertilizer. In the Willamette Valley, one harvest per year is typical. Verticillium wilt and other soil pests affect mint production worldwide.

Initial distillation of mint oil is part of the harvest process, according to some industry observers. Some growers distill their own oil or custom-distill for others. Mint oil moves from the farm to the processor in 55-gallon drums; the grower retains ownership until the oil is sold to a manufacturer. Brokers move oil toward food, cosmetics, and pharmaceutical manufacturers, all of whom have specific requirements for flavors and scents. The oil analysis for various flavor components, blending for specified characteristics, and packaging are part of the first handler's function.



Hops

Hop is a vining perennial grown on trellis systems; hop yards typically produce commercial yields for 15 years or more. Only the female hop plant is grown commercially; hop cones form without fertilization. Hops are used to flavor beer; hop varieties are selected for their flavor characteristics, yield, and disease resistance.

After vines are harvested, the flower cones are removed by a labor-intensive process. Cones are dried, compressed into 200-pound bales, and shipped to cold-storage warehouses. Bales later are shipped directly to the brewer, to pelletizing processors, or to extraction facilities for postharvest processing. Until the buyer accepts the crop, the grower retains title to it.

Prices depend on the variety and end use for the hop. Hops shipped directly to the brewer or to pelletizing facilities typically are used as aroma hops and generally get higher prices than hops used for extraction, the so-called bittering hop. Prices also depend on varietal tests, seed content, and extraneous materials such as leaf residues.

Rain during harvest can greatly reduce the value of the cones if they become discolored or suffer from premature “stewing” during the drying process.

With few exceptions, Oregon’s hop production has been in the same families for several generations.

Traditionally, there has been a first handler between the grower and brewer. These dealers maintain cold-storage warehouses and a network of brewer contacts. Microbreweries tend to work with hop dealers. Multiyear contracts with brewers are the norm. In recent years, growers have had the opportunity to sell directly to larger breweries through direct contracts; about 60 percent of the Oregon crop is sold to breweries producing national name-brand beers. None of the major breweries accepts compressed whole hop cones; rather, they buy pelletized hop or hop oil extract. These breweries now have a network of crop advisers who assist growers; these breweries also are investing in on-farm research, which benefits growers. Organic crop production is under investigation.

About 40 percent of Oregon hops are exported to Germany, Japan, China, and South America.

Industry observers view microbreweries as a positive force in the hop industry. They approach brewing as the wine industry does winemaking, and they view consumers as connoisseurs who

appreciate the challenge of new brewing ideas and interesting new flavors. As a whole, major brewers’ marketing strategy demands consistency across batches, and their mainstay customers don’t want a lingering hop aftertaste or a full bodied ale that is typical of a microbrew. However, major brewers now are producing seasonal half-cases—specialty beers with unusual flavorings—and also compete with their own microbrewery-style beers and organic beers. A recent trend is major brewers’ buying well-established microbreweries, enabling them to more easily establish craft brews and latch onto the microbrew movement. The major brewers typically avoid putting their brand names onto microbrew brands that they own.

Sugarbeets

Harvested acreage of sugarbeets for sugar has fallen about 40 percent in the past decade. Nearly 20,000 acres were harvested in 1999, the decade’s high; the low was 9,470 acres in 2003. Oregon growers harvested 9,800 acres in 2005. The farmgate price has been quite varied in the same period; the high was \$41/ton in 1998 and 1999. The low, in 2004, was \$29.04. Growers received \$39.49/ton in 2005.

Until 2005, sugarbeets were processed in Nyssa, Oregon; since then, one processor in Idaho buys and processes Oregon sugarbeets. Most sugarbeets for sugar are grown under contract.

Sugarbeets grown for sugar must be harvested at an ideal low temperature to preserve their quality; in Oregon, they are harvested in October. First handlers, who may be the growers themselves, haul the sugarbeets to processor piling grounds. A piler system removes dirt, weeds, and trash, then the beets are stored for processing sometime in February.

Oregon also produces sugarbeet for seed, though production is minor compared to north-central states, where Minnesota and North Dakota dominate domestic production. In this subsector, too, the Oregon trend is downward. Harvested acreage has dropped about 34 percent; growers harvested a little less than 3,000 acres of sugarbeet for seed in 2005. High and low prices for seed ranged from \$0.63/pound in 2005 to \$0.49/pound in 1992 through 1995.



Other enterprises



The principal activity in this category is log and firewood production from non-industrial private forest lands—about 16 percent of Oregon forest land—and associated value-added products. A few other minor or confidential enterprises are reported but are not discussed here. In 2005, farmgate value from logs and firewood in Oregon amounted to an estimated \$285 million, the fourth most valuable agricultural commodity statewide (Table 17).

Note: Historically, the term *farm forestry* was used to describe this activity and is used here to provide continuity with previous versions of this document (see “Further resources,” inside front cover). Industrial, public (federal, state, county, municipal), and native-American-owned forest lands are not included in this assessment, nor is nonfarm timber company production and marketing of logs and other forest products. Much of the production information comes from data collected by the Oregon Department of Forestry.

Value added in 2005 was estimated to be about \$161 million, 54 percent above farmgate sales. Of that, about 59 percent was attributed to labor inputs and 30 percent to equipment and machinery; assembly, loading, and transportation; insurance; custom services; administration; and taxes and fees. In most cases, processing or packaging was a relatively insignificant portion of value added.

Income from this enterprise is associated with the production of logs. This category generally underestimates related production and value-added impacts of ancillary farm forest activities on the Oregon economy. The value of materials sold for wreath making, for example, is significant but generally is not adequately reported.

Table 17. Value added other enterprises (2005).

| Commodity | Farmgate value (\$000) | Value added by first handler (\$000) | | | | Total value after first handler delivery (\$000) |
|--|------------------------|--------------------------------------|------------------------|--------|---------|--|
| | | Payroll | Processing & packaging | Other | Total | |
| Farm forest products ¹ | 285,431 | 92,651 | 17,525 | 48,009 | 158,185 | 443,616 |
| Miscellaneous enterprises ² | 12,972 | 1,749 | 562 | 381 | 2,692 | 15,664 |
| Total | 298,403 | 94,400 | 18,087 | 48,390 | 160,877 | 459,280 |

¹ 524,832,000 board feet at \$544.15/MBF (weighted average price).

² Includes hybrid poplars and farm/ranch fee hunting and recreation.

Industry insights

A land owner often hires a logger to harvest logs and take them to the mill. Usually, the mill pays the owner and the logger in shares, according to the contract. About 10 percent of sales are of standing timber; in those cases, the buyer is responsible for harvesting and transporting the logs.

Some growers, however, themselves fill all roles in the harvesting and marketing process, or use alternative methods to harvest and sell logs. That is especially true of larger operations, which derive a significant portion of their income from log sales. There also are incidental harvests, which typically involve on-site milling with portable equipment.

Most logs produced by nonindustrial owners are purchased by larger industrial mills, and products move into the construction and remodeling industries.

Greenery, mushrooms, salal, moss, forest botanicals, and other botanicals from these forest lands contribute to revenue. A growing body of research in the pharmaceutical arena relies on forest compounds.



Further resources

Earlier estimates of farmgate and added values, dating from 1976, are available from OSU Extension's Oregon Agricultural Information Network (OAIN), <http://oregonstate.edu/oain/> That site also has annual summaries from 1997 forward; click on "Ag Summaries (SR 790)."

We also prepare about 40 Commodity Data Sheets for selected commodities and commodity sectors. These provide OAIN estimates as well as estimates by the Oregon Agricultural Statistics Service, part of the USDA's National Agricultural Statistics Service. At the OAIN website (above), select "Commodity Data Sheets."

A 1994 OSU Extension report, "Oregon Agricultural Commodities: Farm Values and Processed Values," EC 1233-E, is available on the Extension website, <http://extension.oregonstate.edu/catalog/pdf/ec/ec1233-e.pdf>

For estimates of the impact on the Oregon economy of the state's agricultural industry as a whole, see "Agriculture & the Oregon Economy," SR 1014, March 2000, by Jim Cornelius, David Holland, Edward Waters, and Bruce Weber. Available at <http://extension.oregonstate.edu/catalog/pdf/sr/sr1014.pdf> A revision of that work, by Bruce Sorte and Bruce Weber, is forthcoming.

Other recent OSU Extension economics studies include:

Sorte, Bruce. 2007. "Oregon County Fairs: An Economic Impact Analysis," SR 1076. [http://ruralstudies.oregonstate.edu/Publications/County Fair Report 061507.pdf](http://ruralstudies.oregonstate.edu/Publications/CountyFairReport061507.pdf)

Sorte, Bruce, and Chris Buerger. 2006. "Economic Impact Study for Detroit Lake and the Upper North Santiam Canyon," SR 1071. <http://ruralstudies.oregonstate.edu/Publications/DetroitLake-SR1071.pdf>

Torgerson, Melissa, Bruce Sorte, and Tim Nam. 2006. "Umatilla County's Economic Structure and the Economic Impacts of Wind Energy Development: An Input-Output Analysis," SR 1067. <http://ruralstudies.oregonstate.edu/Publications/Umatilla-SR1067.pdf>

Sorte, Bruce. 2004. "Jefferson County's Economic Structure: An Input-Output Analysis," SR 1058. <http://ruralstudies.oregonstate.edu/Publications/JeffersonCounty.pdf>

Sorte, Bruce. 2004. "Crook County's Economic Structure: An Input-Output Analysis," SR 1051. <http://ruralstudies.oregonstate.edu/Publications/CrookCounty.pdf>

Weber, Bruce, Bruce Sorte, and David Holland. 2002. "Economic Diversity in Benton County: An Input-Output Analysis," SR 1034. <http://extension.oregonstate.edu/catalog/pdf/SR/SR1034.pdf>



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