

Dimensions of Washington State Agriculture
Written for Future of Farming by
Dr. Des O'Rourke, Senior Agricultural Economist and Advisor

Introduction

Washington agriculture is large and very diverse. It is a significant player in U.S. agricultural production and exports of many commodities, and the national leader in a number of commodities. It plays an important role in the overall state economy and in the economic and civic activities of many counties and districts. It is also a major user of many of the state's land, water and energy resources. This paper summarizes the current dimensions of Washington agriculture, examines past and prospective trends and examines the most important influences of agriculture on Washington and its people.

Current Dimensions of Washington Agriculture

In 2007, Washington agriculture had over 15 million acres in farms. Its 33,000 farmers had an average farm size of 458 acres, farming land valued at over \$800,000 per farm. At the time of the most recent (2002) census of agriculture, there were almost 3,000 of its farms had 1,000 or more acres. Whether measured by acreage, assets or sales or other measures, Washington farms are often very substantial business enterprises.

Cash receipts from Washington farms in 2006 amounted to \$6.14 billion and generated net farm income (excluding government payments) of \$0.7 billion, 11.6 percent of cash receipts. Data from the 2002 census of agriculture indicated that 52.5 percent of land was potential cropland and about 32 percent was harvested cropland. Of the harvested cropland, 37.2 percent was irrigated, enabling it to produce a very diverse array of crops. In addition to family labor, Washington farms in 2002 employed 262,528 hired labor, and had a payroll of almost one billion dollars. About 83 percent of the hired labor worked less than 150 days per year, indicating the industry's large need for temporary labor.

Washington agriculture was the major source of raw materials for the state's food processing industry. In 2004, that industry had 756 establishments employing almost 33,000 workers with an annual payroll exceeding one billion dollars. Production agriculture also fuelled extensive activities for assembling, cleaning, storing, packing, and otherwise preparing fruits, vegetables, grains, legumes and other specialty products for marketing. These activities, normally classified as wholesale trade, employed about 10,000 workers throughout the major agricultural producing districts. Washington farmers and agribusinesses also support major supply and service activities that provide the needed seeds, livestock feeds, fertilizers, chemicals, fuels, finance, accounting, insurance, marketing and other expertise required to keep Washington agricultural products competitive in a global market place. Through these direct and ancillary activities, agriculture remains a key pillar of economic and social life in many of the state's rural communities. Agriculture is no longer characterized by its simple, rural life style. For many farmers and agribusinesses, agriculture is primarily a business that depends for its continuing prosperity on the application of information, science and technology to every facet of its operations.

Trends in Washington Agriculture

While Washington agriculture continues to play a large role in the state's economy, the industry has experienced considerable volatility and change in the last two decades. Both the area of agricultural land and the number of farmers has declined steadily in the last decade. Between 1997 and 2007, the area of land in farms fell by 3.8 percent while the number of farmers fell by 15.4 percent. The biggest decline in area planted was for wheat, which is by far the most land-intensive crop in Washington . Planted acres of wheat fell from a peak of 3.7 million acres in 1991 to about 2.2 million acres in 2007. Much of that reduction resulted from land made idle under the federal conservation reserve program. In contrast to wheat, acreage in other major crops, such as apples and potatoes, rose through much of the 1990s, but lost ground after the onset of the Asian financial crisis that disrupted many key export markets for Washington agricultural products. Acreage has been relatively static for other important crops such as hay and pears but has risen rapidly for minor crops like sweet cherries and wine grapes.

Cash receipts from all commodities at the farm level more than doubled from \$2.8 billion in 1986 to \$6.1 billion in 2006. The value of production of fruits and nuts rose even more rapidly, more than tripling in the period. However, net farm income was quite volatile over the period. Excluding government payments, it reached a peak of \$1.55 billion in 1996, but was below half that level in 1988, 1991 and 2006 and for four consecutive years from 1999 to 2002. Since costs of production tend to rise gradually over time, most of the volatility in net incomes resulted from changes in market prices that were not offset by increased productivity. For example, between 1988 and 1998, wheat prices varied from a high of \$4.83 per bushel in 1995 to a low of \$2.63 per bushel in 1998. Between 1999 and 2007, they varied from a low of \$2.70 in the year 2000 to a high of \$7.60 in 2007. Similar volatility was observed in the prices of many other major Washington commodities.

In general, the domestic market for most Washington agricultural products has been stable over time with only modest rates of growth. In contrast, the export market has been highly erratic. Between 1985 and 1995, when markets in East Asia, Mexico and Latin America were buoyant, Washington agricultural exports grew in almost every major product category. However, a financial crisis in Asia that began in 1997 was followed by economic setbacks in Latin America, Russia and Eastern Europe. Between 1997 and 2006, the dollar value of the state's exports of food grains, feed grains, vegetables, live animals and meats and seeds all fell in current dollar terms. Exports of fruit and fruit products and of dairy products stumbled for several years before resuming their growth in the middle of the next decade. The reduction in acreage of products like potatoes and apples after 1997 was strongly affected by the setbacks in export markets.

Farmers try to offset low or falling prices by increasing productivity per acre. However, yield increases in Washington agriculture have generally not been sufficient to compensate for lower prices and rising costs. Over the period from 1988 to 2007, yields of the three major field crops, wheat, potatoes and hay, have all trended upward. The average annual increase in yields was 0.4 bushels for wheat, 3.6 cwt for potatoes and 0.035 tons for hay, substantially less than one percent per year for each commodity.

Importance of Agriculture to the Washington Economy

There are many different indicators of the importance of agriculture to the Washington economy. Some of these have already been discussed, including the fact that farmers own or operate most of the state's private land. In addition, farm production, and the ancillary supply, processing and marketing services derived from farm production, provide full or part-time employment for almost 300,000 people, most of those in the state's rural areas or the towns that serve them.

Agriculture also occupies a unique place in the state's water supply. In dryland areas, much precipitation falls on private farm lands, so farming activities have a major influence on the quality and volume of ground water and surface water available to the non-farm communities. In western Washington, farm use of water can affect the quality of water in the Puget Sound and other coastal waters. In central Washington, a series of dams on the Columbia-Snake river system both generate electricity and provide storage for water that is delivered to farms by a network of canals. Cheap water and energy have transformed marginal desert land into highly productive cropland that now supports much of the state's food preparation and food processing industries. However, there are many other claimants for the state's land, water and energy, including urban, environmental, sporting and Native American interests. Thus, agriculture has found itself at the center of a continuing debate about how these resources should be allocated.

An often overlooked benefit of Washington agriculture is that it not only provides much of the food needs of its own citizens but that it generates a large surplus which helps meet the needs of a world population that is increasing by 70 million persons per year. Washington is ideally placed to serve the needs of heavily populated, land-poor Asian countries. Exports of Washington agricultural products help pay for imports of foods like oranges and bananas that lead to healthier, more varied consumer diets and for imports of many non-foods. Through increases in productivity, Washington agriculture (as a key contributor to U.S. agriculture) has helped bring down the share of U.S. incomes spent on food from 24 percent in 1950 to 10 percent in the year 2000. This has given the average U.S. consumer an additional 14 percent of income that can be spent on discretionary purchases such as buying their own homes, buying personal computers and software, or traveling for pleasure, activities which help other major industries in the state such as forest products, software and aerospace.

Agriculture is also an important engine for the state's economy in terms of employment, incomes, taxes and trade. The 300,000 people engaged in farming and ancillary activities in 2002, including farmers, family member and hired workers, earned over \$3 billion in net income, wages and salaries. In the same year, Washington farmers alone paid about \$150 million in property taxes, much of which went to support public services in rural counties. Over 90 percent of the production of wheat, peas and lentils and 30 percent of the production of apples, pears and sweet cherries are exported each year. This provides a major source of business for the state's transportation and storage industries, brokers, freight forwarders, ports and airports, and the many other service professionals involved in international transactions.

A number of efforts have been made to estimate the multiplier effects on the state's economy of production agriculture. Such efforts often use sophisticated input-output models that rely on many assumptions about the effects of economic activities in one sector on economic outcomes in another sector. Thus, such estimates are open to many potential sources of error. In input-output models, the total effect of productive activity in any one sector is made up of direct, indirect and induced effects. The direct effect measures the value of initial agricultural production. The indirect effect measures changes in the value of the output of the sectors that supply inputs to agriculture and food processing. The induced effect measures the change in household income and household consumption as a result of the change in payrolls for labor engaged in direct and indirect production. A 2004 study by Ghosh and Holland using data for the year 2000, suggested that each dollar of agricultural sales to domestic or foreign markets generated \$1.70 in total sales in the Washington economy. Each job in agriculture created about 1.62 jobs in the state economy, but each job in processing for export created about 2.58 jobs.

An input-output analysis by Dr William Jensen focused solely on the tree fruit industry found that the Washington tree fruit industry alone in 2004 generated nearly \$6 billion in economic value and 140,000 jobs in Washington . Over 70 percent of that value was created in just three regions, the Yakima Valley, the greater Wenatchee area and the Columbia Basin. The Jensen study noted that agriculture is not solely a provider of minimum wage jobs. The agricultural industry supports many highly paid professional workers such as advertisers, trade analysts, computer programmers, accountants and graphic designers. Even part-time and migrant workers earn well above the state's minimum wage. However, their annual earnings from Washington agriculture are low because their period of employment is short. Many enhance their earnings by farm work in other states, but no estimates are available on their total annual earnings.

Diversity of Production of Washington Agriculture

Washington agriculture is diverse in many different ways that affect the mix of commodities produced. It has at least four different climatic zones that support different types of agriculture. The high rainfall, coastal climate of western Washington is suitable for dairying, cool season vegetables and berries. With the benefit of irrigation, the arid desert climate of central Washington supports intensive cultivation of many fruits, vegetables, potatoes and specialty crops, such as hops and mint. The moderate-rainfall, dryland farming area of eastern Washington is especially favorable for the production of grains and legumes. In addition, there are extensive rangelands throughout the state at higher elevations that are suitable for cattle ranching.

Traditionally, about two-thirds of Washington agricultural output by value has been crop based and one third based on livestock and livestock products. For the U.S. as a whole, the ratio has tended to be closer to 50:50. In 2006, crop production accounted for an unusually high proportion of the value of Washington agricultural production at 74 percent, while livestock and livestock products accounted for a particularly low share of 26 percent. In 2006, meat animals and dairy products dominated the livestock sector, each with about 40 percent of the total value, while poultry products and miscellaneous livestock each accounted for between 8 and 9 percent. In the crop sector, fruits and nuts

accounted for 45 percent of total crop value. Vegetables accounted for 21 percent, food grains for 11.5 percent and feed crops for 7.4 percent. The category of “All other crops” accounted for almost 15 percent of the total. It includes farmed forest products, Christmas trees, floriculture, nursery and other horticultural products, and agaricus and other mushrooms.

In 2006, 12 different commodities in Washington had a value of production exceeding \$100 million, while a further 9 commodities had a value exceeding \$50 million. These 21 commodities accounted for over 90 percent of the total value of Washington agricultural production. Apples, milk and wheat ranked numbers one, two and three. Cattle and calves, potatoes and hay filled the next three places. These same six commodities led the rankings in 2004 and 2005 as well as twenty years earlier in 1982-86, as documented in the AG 2000 report. Their relative position in any year has been affected most by year-to-year price swings. However, over time, the biggest single change in value has occurred for apples. Their value in 2006 was almost 4 times that reported for 1982-86, partly because production more than doubled in the period.

Other commodities making big gains over time have been sweet cherries, which moved up from being ranked number 13 in 1982-86 to number 8 in 2006, onions which have jumped from number 22 to number 10, and grapes that have moved up from number 16 to number 11. A number of commodities have dropped sharply in the rankings. Asparagus fell from number 14 to number 28, as more of the production and processing moved off-shore. Hops fell from number 9 to number 14 as the hop content of beer has declined over time. Eggs fell from number 12 to number 21 as egg consumption suffered from cholesterol concerns. Other commodities that suffered large falls in rankings included minor dryland crops such as barley and dry edible peas and beans, and vegetables for processing, such as green peas and carrots. These shifts in rankings show how important it is for the state’s farmers and agribusinesses to remain open to further diversification in response to the changing tastes and preferences of consumers and the changing demands of the marketplace.

However, Washington agriculture has not pursued diversity for its own sake. It has focused on products and markets where it has comparative advantages in price or quality. It has become a national leader in production of a wide array of products. In 2006, it was ranked number one or number two among U.S. states in hops, mint oil, fall potatoes, apples, grapes, sweet cherries, pears, carrots, sweet corn for processing, green peas for processing, asparagus, onions and red raspberries. It accounted for over 40 percent of national production of hops, mint oil, apples, concord grapes, pears and red raspberries.

Washington agriculture is also diverse in terms of the size and organization of farm operations involved. Data from the 2002 Census of Agriculture show that while average farm size was 426 acres, 20,000 farms had less than 50 acres while 3,000 farms had more than 1,000 acres. The average value of sales per farm was \$148,327. However, 15,000 farms had sales of less than \$2,500 while almost 2,000 farms had sales of \$500,000 or more. While 85 percent of all farms were owned by individuals or families, 6.3 percent were organized as partnerships and 7.6 percent as corporations.

Another phenomenon that has become more important in Washington agriculture is increased integration, both horizontal and vertical. For example, grain farmers have diversified into production of seed crops, straw or specialty grains. Some fruit farmers have integrated forward into packing and marketing, while some fruit packers and marketers have integrated backward into production. The volume and value of sales of many Washington commodities have become concentrated in increasingly fewer, larger entities. That concentration is likely to continue as producers face increased pressure from major retailers.

The diversity of Washington State agriculture is both a strength and a weakness. It is a strength to the extent that it allows different climatic zones to specialize in the commodities that are most suitable to their resources and constraints. It also permits the state considerable flexibility in adjusting the mix of products as market conditions change. However, it is a weakness to the extent that it reduces the commonality of interests across different segments. Different sectors of the industry tend to fare differently in terms of sales, prices or profits in any year. The world market for grains may be favorable when the world market for fruit is depressed, or vice versa. Different sectors face different challenges and are likely to have different long-term perspectives on many issues. This means that it is difficult for the industry to build broad agreement on future goals or strategies.

Diversity of Functions of Washington Agriculture

In addition to primary production, Washington agriculture supports a diverse array of other economic activities. One such set of activities is involved in getting products produced and harvested. Washington agriculture is a major customer for the services of utilities, farm machinery and equipment dealers, aerial sprayers, helicopter drying services, veterinary services, bankers, accountants, computing experts, insurance companies and suppliers of fertilizers, herbicides, insecticides and biological controls for insects and diseases. Many suppliers of these goods and services depend primarily or exclusively on their agricultural clientele. For example, specialist fruit tree nurseries, seed companies and livestock breeders provide the superior genetics producers now need to increase their productivity and stay competitive in world markets. Specialized contractors provide fumigation services, spray services, and custom planting, pruning and harvesting. Agriculture also supports a growing cohort of specialized consultants to help monitor the condition of soil, water, plants and animals, and to assist with the record-keeping required by government regulators and private certification programs. While the individual grower's judgment is still critical to good farm and ranch management, that judgment is increasingly supplemented by a host of scientific tools and technologies and with the assistance of paid advisors.

Once the crops are harvested or the livestock sold for slaughter, they undergo many additional procedures in-state that add value for the eventual customer. For example, grains and legumes may be warehoused, cleaned, sorted, graded and delivered in bulk or packaged form to exporters or re-sellers. Much of the processing of these products into consumer products, such as bread, cakes or pasta, takes place outside the state or outside

the country. In the case of milk, fruits and vegetables, some portion of the product may be cleaned, stored, graded and packed for fresh sale, while the rest may be subject to various forms of processing, including freezing, canning, juicing or dehydration. Fresh packing is of major importance for fruits, vegetables and liquid milk. Processing in Washington is most important for apple juice, grape juice, wine, applesauce, frozen and canned vegetables, cheese and other dairy products, and berries. Most livestock slaughtered in Washington State, whether cattle, sheep, pigs or poultry, is packed in whole or in part for fresh meat sales. Little is used in state for further processing.

Another major set of functions relates to the marketing and transportation of these value-added products to customers across the state, the nation and the world. Hundreds of firms are involved in the marketing of this diverse array of products. They find and woo customers, provide suitable packaging and promotion, prepare the needed documentation, arrange for shipment, and provide after-sale services. Some large companies market only their own products, others market for many smaller growers on a fee or commission basis. A supporting network of firms supplies packaging, design services, advertising, point of sale material, market intelligence and other services. Some of these marketing activities, and some of the support services, are also provided by the state's 25 commodity commissions using grower assessments.

The final, major set of functions relates to exporting. The additional revenue earned in export markets has become crucial to the profitability of much of Washington agriculture. Exporting involves costs and risks additional to those involved in domestic marketing. Exporters must ensure that their products can withstand long sea voyages and still meet the different requirements of the importing countries in terms of quality, safety, packaging, labeling, etc. Many exports involve dealing with different currencies. Exporters may face tariffs, quotas or other customs regulations that add cost. Finally, in the case of a dispute over the quality of goods received or over payment, exporters may have to appeal to a court in a foreign country. Thus, to run effective export programs, exporters have to make major adaptations in their internal operations and often require the specialized assistance of banks, insurance companies, transportation agencies, freight forwarders, customs agents, etc., to help minimize costs and reduce risks. Much of those activities take place in major urban centers of the state such as Seattle or Tacoma. The value of Washington agricultural exports exceeded \$2.2 billion in 2006 and was expected to increase substantially in 2007 and 2008. Thus, one could expect a commensurate increase in the related economic activity in the rest of Washington State.

Miscellaneous Issues

Washington agriculture plays a very important role in keeping the rural parts of the state in touch with changes in science and technology inside and outside agriculture and in touch with the major changes in the global economy. For example, the Washington wheat industry was among the leaders in the 1950s and 1960s in identifying how rising incomes in traditional rice-eating countries like Japan, South Korea and Taiwan would trigger demand for consumption of alternative wheat-based foods. The Washington apple industry, through its pioneering marketing efforts for fresh apples, helped open up many developing country markets for other Washington agricultural products such as pears,

sweet cherries and fruit juices. In addition to conducting trade missions around the globe, Washington agriculture has often given foreign visitors their first experience of U.S. society. As a result, farmers and agribusinesses throughout Washington are more globally aware than their counterparts in most other states. Many have traveled abroad, and many have hosted their foreign counterparts on their farms or in their firms.

Washington farmers and agribusinesses have also been in the forefront in applying the latest science and technology to their diverse operations in order to compete effectively in world markets against countries that have cheaper land, labor or capital. In the 1950s, 1960s and 1970s, USDA and university scientists played a major role in identifying and transferring appropriate science and technology. However, since the 1980s, as public funds for research and extension have fallen in real terms, many of the state's commodity groups have used grower assessments to initiate their own research programs, often in partnership with USDA and university scientists. In addition, as private sector discovery has raced ahead in fields such as biotechnology, biological controls, information systems, telecommunications, electronics, computing, robotics and other fields, Washington agriculture has been willing to selective apply any advances in science and technology that might help to increase productivity, improve quality, or lower unit costs.

Many farmers and agribusiness executives that learned their leadership skills in agricultural organizations have gone on to apply those same skills in local voluntary organizations, or as directors of school boards, county commissioners, state or federal legislators, leaders of state or national agencies and organizations and directors of other civic bodies. This contribution of Washington agriculture to state and national society is frequently overlooked.

Washington farmers have increasingly opened up their land to urban dwellers to share in the experiences of a working farm or for hunting, fishing, hiking or other recreational purposes. Such "agri-tainment" is likely to become more important as fewer and fewer urban families have rural roots.

Summary

Washington agriculture is a major direct and indirect contributor to the state's economy in terms of employment, wages and incomes and the resultant increases in consumption, imports and exports. The diversity of its natural resources and the flexibilities of its farmers and agribusinesses mean that it will continue to pursue market opportunities wherever they arise in the production and marketing of food, fiber, fuel, pharmacological products or agri-tainment. Its impact will continue to go beyond the more obvious agricultural activities of production, fresh packing and processing to stimulating a wide array of supply and marketing services. It will continue to play a special role in the viability of Washington State's rural areas, not only in its economic contribution, but also in its contribution to rural society, and in its leadership in science, technology and civic and social affairs.