

Graphically Speaking! Washington State Agriculture: A Systems Flow Perspective

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Introduction

On any given day across the State of Washington, there are hundreds of thousands of people engaged in bringing food from the field to the table. At the nexus of this statewide food production system are farmers and ranchers. Situated throughout Washington, these farmers and ranchers grow and raise a cornucopia of agricultural products. But their numbers--an estimated 77,000 strong in 2007—pale in comparison to the extensive array of people involved in supplying inputs, materials and services to these farms and ranches; not to mention the diverse range of people engaged in the distribution and transportation of farm products, the processing of raw agricultural goods, and the marketing of food to consumers, near and far.

At first blush, a couple dining at an exclusive Seattle restaurant featuring Washington-grown fare might think they are far removed from the grain farmer in the Palouse or the rancher in Yakima or the Walla Walla vintner or the food processor in Mount Vernon, but there is a vital and oft neglected connection. In this brief, we take a closer look to the agricultural/food system in Washington State, focusing on the various connections from the field to the table.

Washington agriculture has been defined as “the farming, ranching, processing, business, and associated cultural activity that combine to produce food, fiber, and certain industrial goods for consumers in the state and around the world” (Cornelius, 1988)¹. In general, raw agricultural products are transformed through a complex network of transportation, handling, processing, and marketing channels into final goods for consumers. While growers (farmers and ranchers) represent the nexus of agriculture, processors, input suppliers and services, distributors, merchandisers and brokers, consumers, and governments all have an important stake in the industry. Here, we utilize a systems approach in assessing the extensive scope and scale of the agricultural economy in Washington State.

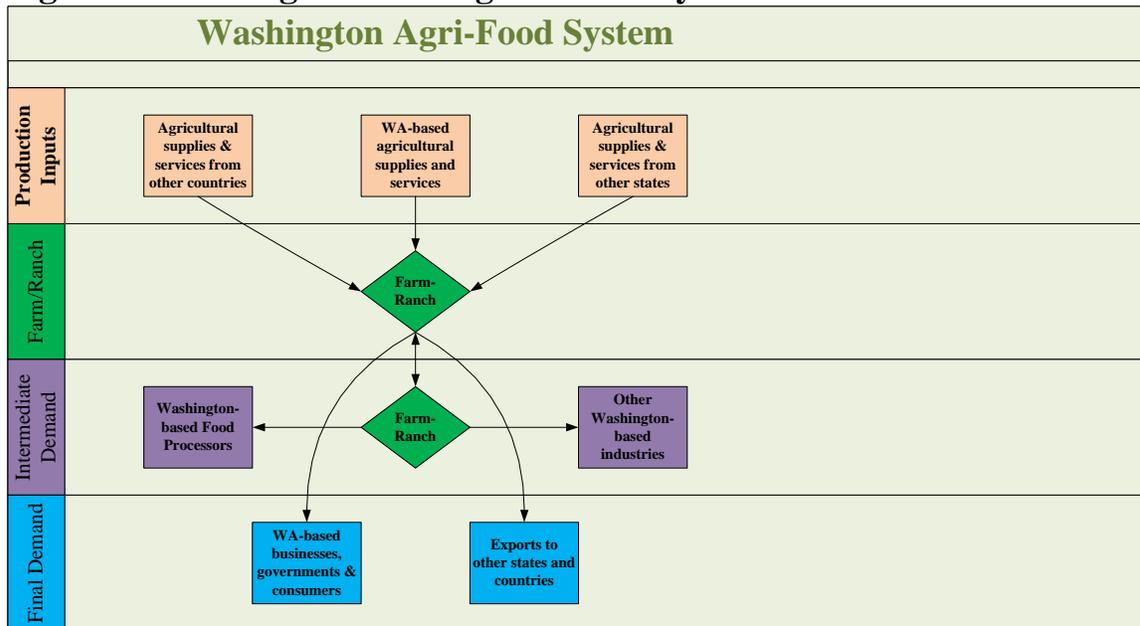
Conceptual Understanding

Simply put, a food system is composed of a complex network of connections created by the growing and distribution of food that we consume. On the supply side, these connections include farmers and ranchers along with the

¹ James C. Cornelius was the lead author for a strategic analysis of agriculture in Washington State. Prepared for the Washington State Department of Agriculture, the June 1988 report was entitled, *AG-2000: Economic Strategies for Washington Agriculture*.

various linked industries and businesses that provide supplies and services to them (Figure 1). There is an extensive array of linked industries and businesses providing inputs, materials and services to farmers and ranchers including manufacturers of farm equipment and machinery; suppliers of seeds, feed, fertilizers, and chemicals; and service providers to agribusinesses, such as transportation, banking, and computer software. The agri-food system also includes the food marketing industries that link farms to consumers and which includes food processors, brokers and wholesalers, retailers, informal channels (farmers markets, roadside stands), and food service establishments (e.g., restaurants). While many of these agri-food connections are found between various enterprises within Washington State (indeed, there are pockets or clusters of integrative agricultural activity within a number of growing regions), this food system is “open” to outside trade with businesses, consumers, and governments. These entities in other states and foreign countries supply agricultural enterprises in Washington with needed equipment and machinery, materials, and services.

Figure 1. Washington State Agricultural System



The demand side of agricultural products is comprised of three major components: intermediate demand; institutional demand; and other final demand. As might be expected, the major component of the demand for raw agricultural commodities is intermediate demand—about 70 percent of total

agricultural production in Washington State.² Intermediate demand represents the movement of raw agricultural products to other sectors for further production. These sectors may include other farms and ranches—producing grain and hay for to supply feed for local livestock; growing seed corn and propagated plants and trees for field and row crop farmers, orchards, and nurseries; and spreading animal waste on field crops. For instance, nearly a fourth of field and seed crops’ total production is delivered as feed to livestock producers in the state. Food processing sectors receive a sizeable share of raw agricultural production, particularly from animal agriculture (e.g., cattle ranches, dairy farms, poultry growers, hog farms) and growers of vegetables and fruits. Dairy farms deliver their milk to creameries, butter and cheese factories for further processing into fluid milk, creamery butter, cheese and ice cream. Hop growers and vineyards market their hops and grapes as key ingredients for beer and wine production. Orchards and row crop farms deliver their fruit and vegetable production to enterprises for further processing into canned, frozen, or dehydrated products. Nurseries deliver their trees and shrubs to institutional and residential contractors and landscapers. Still other industry sectors—food wholesalers and retailers, restaurants and bars, and biofuel producers—utilize raw agricultural products for further processing and final sales.

Institutional demand is non industry demand comprised of households and governments within Washington. Examples of the latter would be direct marketing of fresh fruits and vegetables, and products from nurseries and greenhouses; such raw agricultural products do not enter the various food processing streams or are delivered to residential contractors and landscapers.

Other final demand for agricultural production in Washington State is delivered to businesses, consumers, and governments beyond the state’s borders—whether elsewhere in the Pacific Northwest, or in Midwest or Middle Atlantic/Northeast markets, or sent abroad to various foreign markets for ultimate (final) consumption. Nearly forty percent of the total value of agricultural production is delivered to out-of-state destinations.

² Much of the quantitative information utilized here is from the Washington State Input-Output Model, the most comprehensive analytical tool available of statewide economic activity. The most recent table utilizes economic data and information for the calendar year of 2003 (Chase Economics. *The 2003 Washington State Input-Output Study*. Report prepared for the Strategic Freight Transportation Group, School of Economic Sciences, Washington State University, July 2006. http://www.sfta.wsu.edu/research/reports/pdf/SFTA%20Research%20Report%2019_Chase%20All%20Wash%20I%20O.pdf).

A Graphical Approach

In 2006, the Washington State agricultural industry—composed of 34,000 farms and ranches on 15.1 million acres, had a record production valued at \$6.669 billion (Table 1).³

Table 1. Washington State Agricultural Industry, 2006

Agriculture sector	Value of production (\$millions)	Employment			Labor income		
		Wage & salary	Farm proprietors	Total	Labor earnings (\$millions)	Proprietors' earnings (\$millions)	Total (\$millions)
Field & seed crops	\$1,505.0	5,616	8,616	14,231	\$283.1	\$27.7	\$310.8
Vegetables & fruits	\$3,060.5	27,800	18,804	46,604	\$757.7	\$74.1	\$831.8
Animal agriculture	\$1,564.1	5,245	2,633	7,878	\$193.5	\$18.9	\$212.4
Greenhouse, nursery & floriculture	\$540.2	5,382	2,653	8,035	\$178.5	\$17.5	\$196.0
Total	\$6,669.8	44,043	32,705	76,748	\$1,412.8	\$138.2	\$1,551.1

Sources: USDA/National Agricultural Statistical Service, Washington Field Office; Chase Economics.

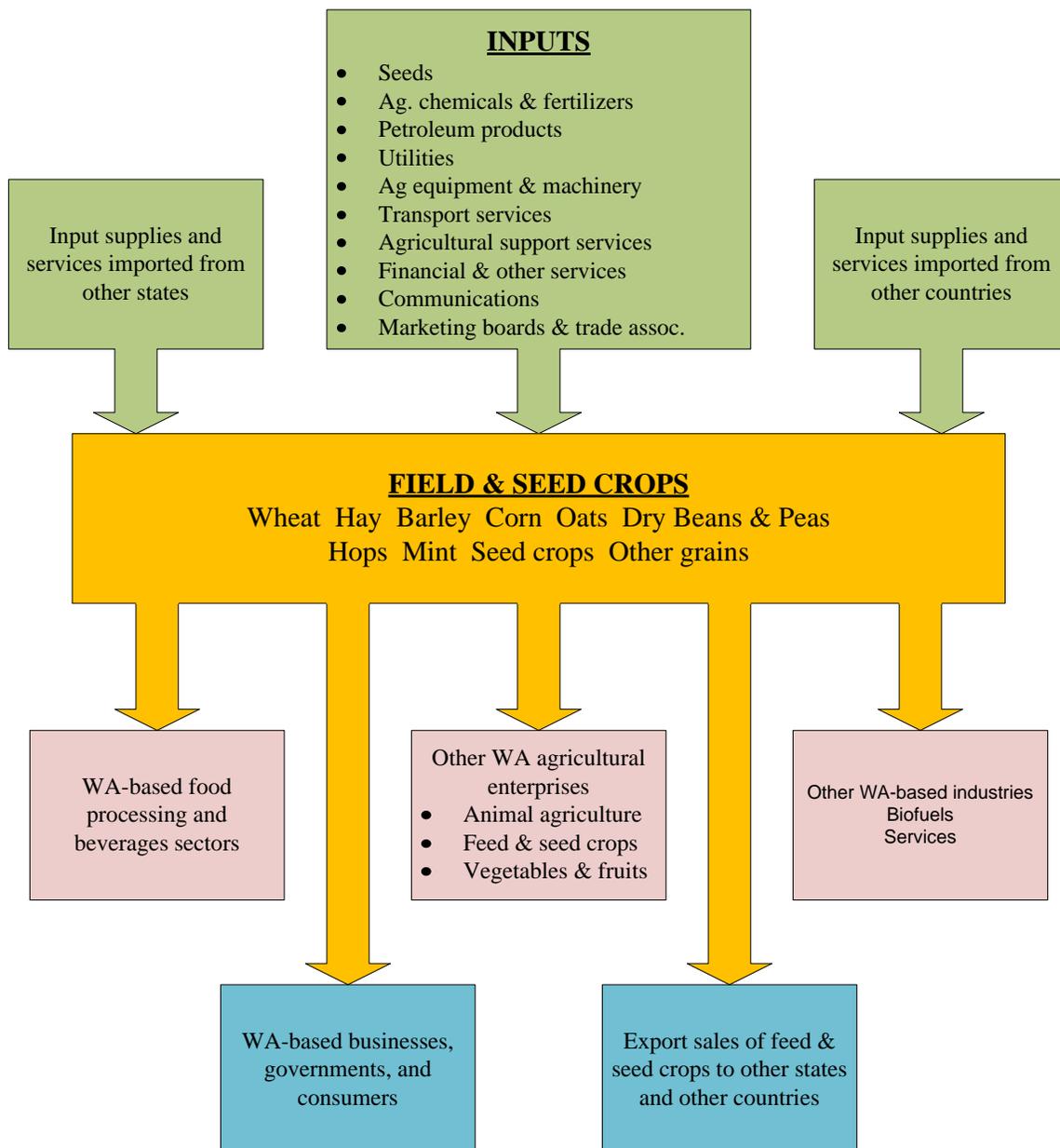
For ease of presentation, the agricultural industry in Washington State is subdivided into four interrelated segments—field and seed crops; vegetables and fruits; animal agriculture; and greenhouse, nursery, and floriculture. Each of the following charts capture both the essence and detail of these agriculture segments—from supply chain to market connection.

³ Based on the *2007 Washington Annual Agricultural Bulletin* (USDA/National Agricultural Statistical Service, Washington Field Office) and the 2003 *Washington State Input-Output Study*.

Field & Seed Crops

Field and seed crops are defined on a commodity basis to include production of grains and field crops, including cash grains (wheat, corn, barley, lentils, dry beans and peas, canola, and oats); sugar beets, alfalfa and hay, hops and mint.

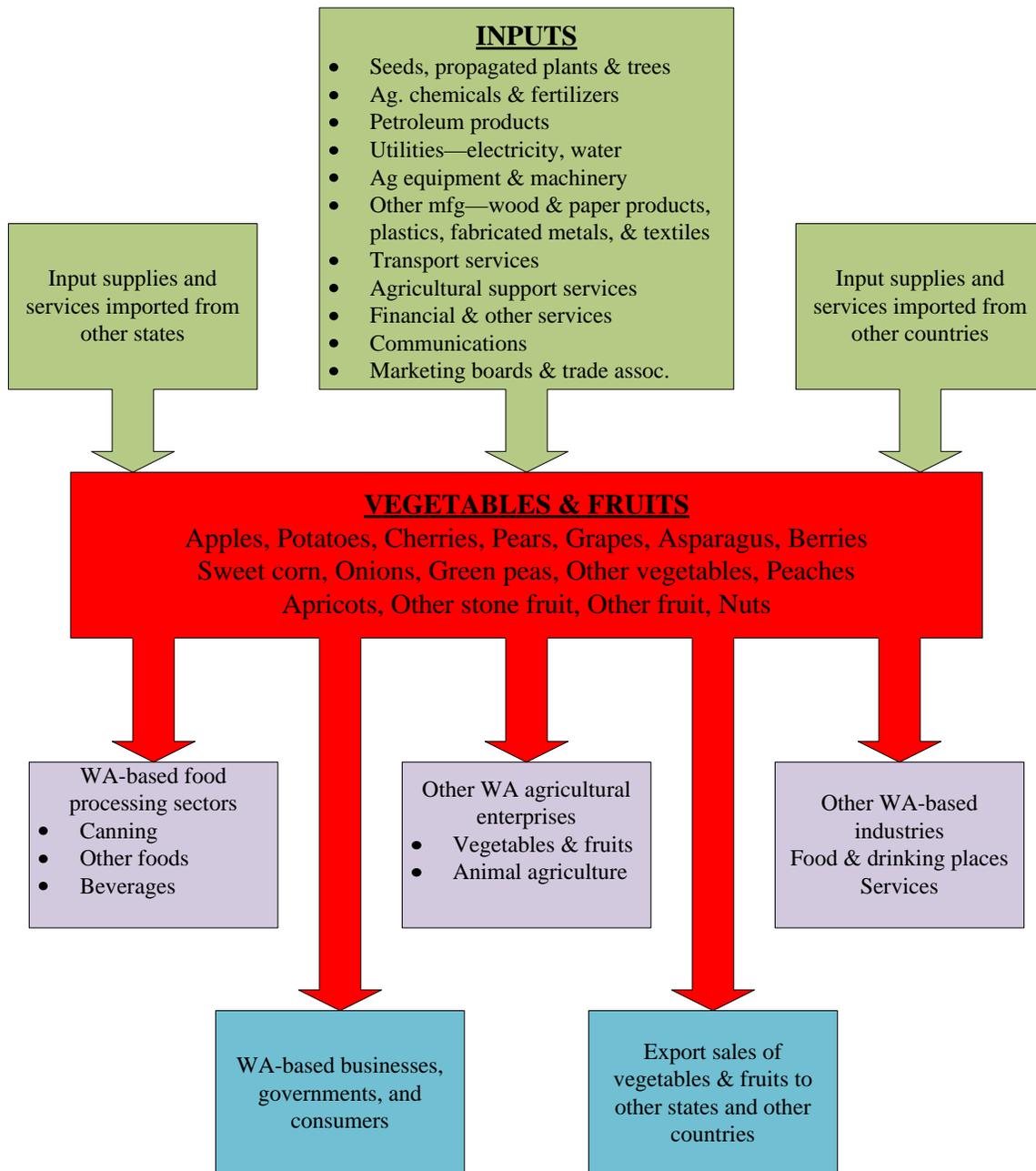
Figure 2. Field & Seed Crops in Washington State



In 2006, field & seed crops production in Washington State was valued at \$1.5 billion. Leading crops were wheat (winter and spring), alfalfa and hay, hops, corn, and mint.

Vegetables and Fruits

Figure 3. Vegetables & Fruits in Washington State



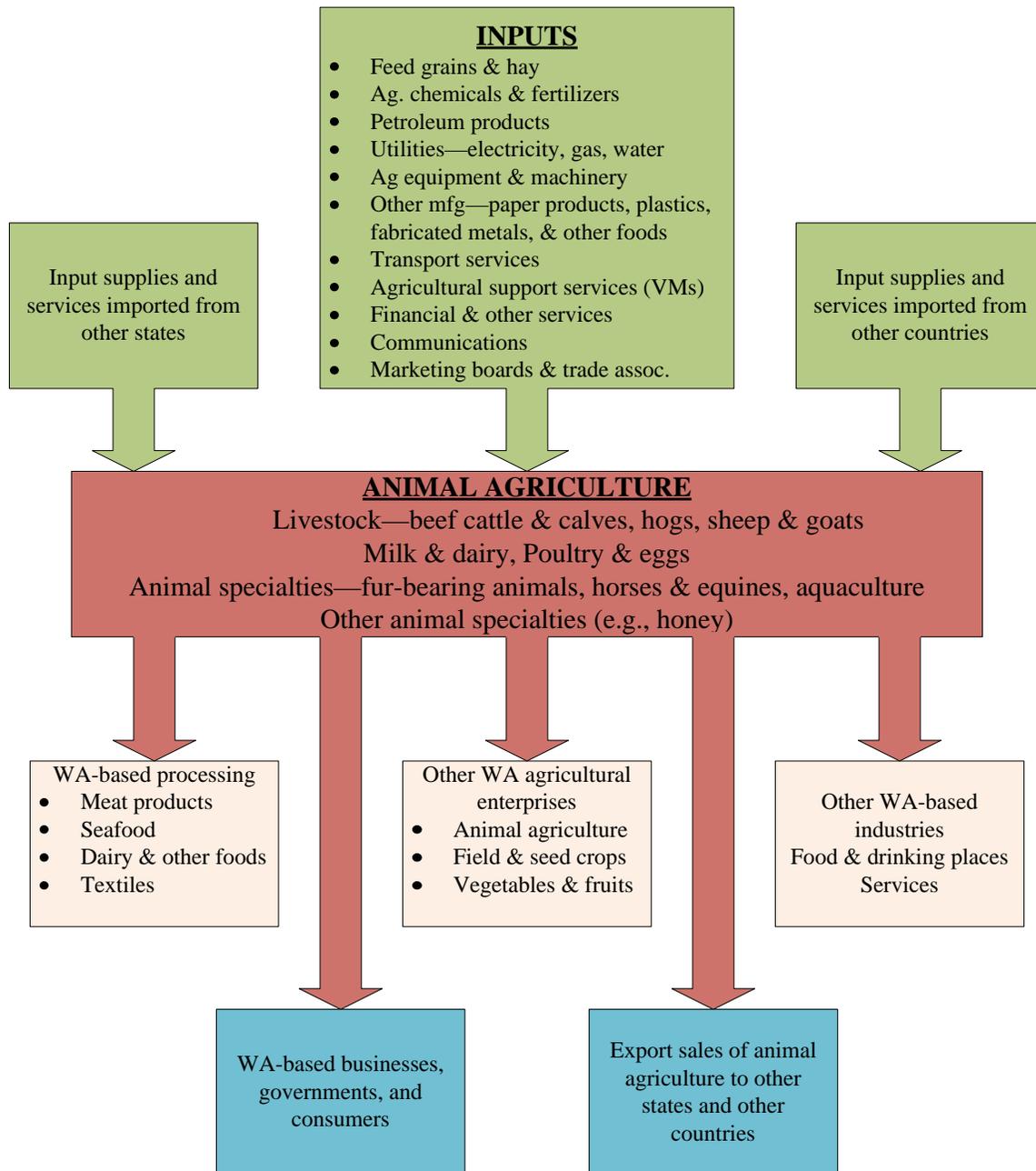
Vegetables and fruits are defined on a commodity basis to include the production of fruit and vegetable crops along with the production of

potatoes⁴, including asparagus, carrots, green peas, sweet corn, green beans, melons, onions, tomatoes; berries, grapes, apples, apricots, cherries, nectarines, peaches, pears, plums, and tree nuts. Vegetables and fruits are the leading agricultural sector in Washington State with a 2006 production valued at \$3.1 billion. Leading crops were apples, potatoes, cherries, pears, onions, grapes, sweet corn, and blueberries.

⁴ USDA officially classifies potatoes as a field crop; for technical/economic matters, the Washington State Input-Output Study has historically placed potatoes into the vegetables and fruits sector.

Animal Agriculture

Figure 4. Animal Agriculture in Washington State

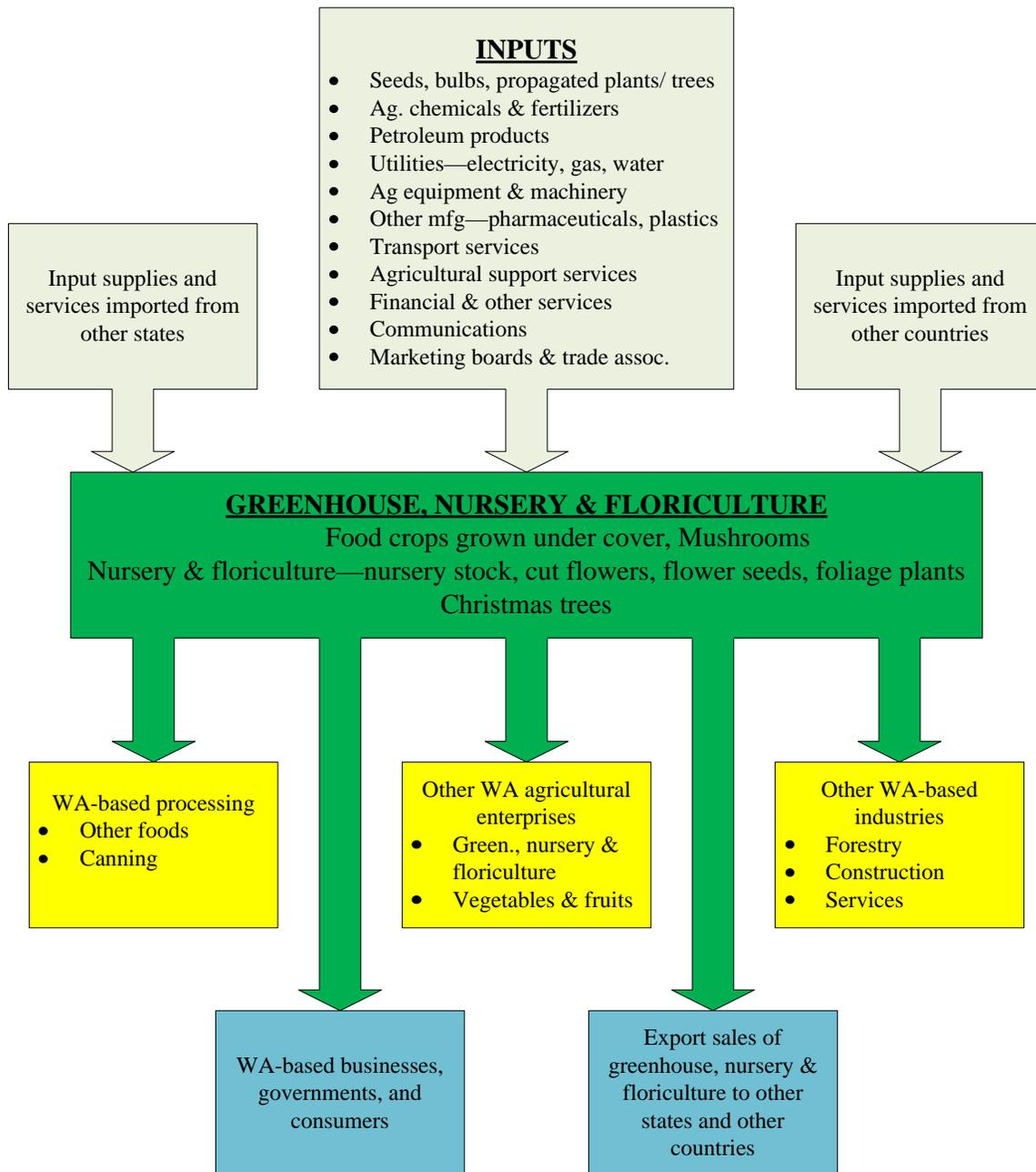


Animal agriculture is defined on a commodity basis to include production of livestock and related products including beef cattle and calves, hogs, sheep and goats, dairy cows, poultry and eggs, fur-bearing animals (e.g., mink and rabbits), horses and equines, aquaculture (finfish and shellfish), and other

animal specialties (honey production). In 2006, animal agriculture production was valued at \$1.6 billion, with leading commodities of milk, cattle and calves, aquaculture, chicken broilers, and eggs.

Greenhouse, Nursery & Floriculture

Figure 5. Greenhouse, Nursery & Floriculture in Washington State



Greenhouse, nursery and floriculture is defined on a commodity basis to include horticultural specialties such as ornamental plants and nursery products, cut flowers, shrubbery, flower and vegetable seed, and sod; food crops grown under cover such as bean sprouts, mushrooms, hydroponic

crops, and “hothouse” vegetables; and Christmas trees and other farm-based forest-related products. In 2006, production of greenhouse, nursery and floriculture was valued at \$540 million.