

**Economic Impact
of
The Tree Fruit Industry
in
Washington State and the Northwest**

William S. Jensen, Ph.D.
Vancouver, Washington

August 2004 / Executive Summary – Washington State

*Study Funded by the Washington State Horticultural Association and
the Washington Tree Fruit Research Commission*

EXECUTIVE SUMMARY

The tree fruit industry of Washington State is a major contributor to the economic health and well being of the state and its fruit growing regions. The household expenditures generated by this tree fruit industry activity provide a significant level of support for every local economic sector – from health care to retail trade to education and recreation.

	<u>Output Impact</u>	<u>Farm-Gate Value</u>
<u>State of Washington – Tree Fruit Industry</u>	<u>\$ 5.6 billion</u>	<u>\$ 1,249,826,400</u>
Yakima Valley Region (FRD 4)	\$ 2.1 billion	\$ 491,825,900
North Central Region (FRD 3)	\$ 1.5 billion	\$ 411,527,000
Columbia Basin Region (FRD 5)	\$ 820 million	\$ 223,584,900
Other FRDs (1,2,6, & 7)	\$ 350 million	\$ 83,090,600

**FRD-Fruit Reporting Districts

	<u>Income Impact</u>	<u>% of Total Regional Income</u>
<u>State of Washington</u>	<u>\$ 2,842,333,172</u>	<u>1.5%</u>
Yakima Valley Region (FRD 4)	\$ 1,075,744,611	11.0%
North Central Region (FRD 3)	\$ 798,499,222	24.6%
Columbia Basin Region (FRD 5)	\$ 409,606,035	14.5%
Other FRDs (1,2,6, & 7)	\$ 178,890,063	0.1%

Study Objective

The study used accepted input-output methodology to determine the contribution of the tree fruit industry on the state and local economies.

Methodology

The basic method for this impact study is a disaggregated economic impact model developed by William Jensen and Hans Radtke for use in both the natural resource (fisheries and forest products) and the agricultural industries. The model utilizes input-output analysis (the United States Forest Service IMPLAN Model) to support its computations.

Disaggregated impact models are effective assessment tools for evaluating the consequences of economic change. They also provide a detailed analysis of specific industry operations and a thorough evaluation of resulting economic impacts on the effected communities.

Input-output analysis is the name given to an analytical framework developed by the late Harvard Professor Wassily Leontief. For this important achievement he received the Nobel Prize in Economic Science in 1973. Input-output models help economists understand how a particular region or economy functions based on measured relationships among the participants.

An input-output model approximates an economy (country, state, region, or county) by defining the economic relationships among economic sectors (sector meaning any homogeneous grouping of businesses, organizations, or industries such as fruit farming or insurance agencies). These economic relationships are expressed as dollar values or purchases or sales between specified economic sectors (these are called basic sectors). Depending upon the model, there can be from a few dozen to as many as several hundred sectors (the IMPLAN model uses 509 sectors).

Imports take money out of the region's economy. The basic sectors bring money into the regional economy. These exported dollars begin a multiplier process. A multiplier is characterized as a complex system of economic transactions that follow a sale of a good or service. They create a primary ripple (much like a drop of liquid when it splashes) by causing a direct impact on the purchases of effected suppliers. These same suppliers, in turn make purchases to meet these demands – another smaller ripple in the economy. This continues on for many cycles; and it is known as a multiplier effect.

Each sector purchases goods and services from itself and/or from other sectors. Sectors will also sell goods and services both to themselves and to other sectors. The relationships among these many sectors are arrayed in a matrix format and an algebraic technique (matrix inversion) is used to calculate the direct and indirect impacts of change in sectors of the model. One of the resulting outputs measuring these impacts is called a "response coefficient." A response coefficient is the response of income to increases or decreases in output. Response coefficients from the IMPLAN model and tree fruit industry operating detail provide the basis for the disaggregated modeling used in this evaluation.

Data Sources for the Impact Assessment Model

The disaggregated model has three operational data categories:

Commodity – This information was derived from state, industry contacts and internet sources. It represents an estimated average value per ton of each commodity category.

Packer/Processor – This information was obtained from industry and various internet sites such as Robert Morris Associates (bank credit sources). Because the Census of Manufactures and most other sources are based upon very general category levels (all fruits and vegetables are combined), it was necessary to create average packer and processor data for the model.

Grower/Rancher - Clark Seavert, Superintendent of the Oregon State University Mid-Columbia Agricultural Research and Extension Center, developed farm enterprise budgets that were converted to per acre costs. The model uses 1000 acre farms as an average and farm budgets were based upon this size multiplied by the per acre cost estimates. The new 2002 USDA Census of Agriculture was used as the basis for the bearing acres in each location and these, in turn were converted to 1000 acres average farms. The number of farms shown in the census figures were not useful for this study because they include any farm with \$1,000 or more in gross receipts and no useful operating data concerning farm budgets for agricultural sectors.

The use of average categories and operating data was necessitated by the limitations of detailed, available information. However, the data inputs were considered conservative as were the final impact values.

A Final Note:

Output or revenue (total sales) is a common reference in business statistics; and it is a favorite ploy of economic development or chamber of commerce representation. Many of these representations also overlook the diminishing effects of imports and out-of-state ownership. They reflect only gross economic activity; they do not convey economic efficiency or well-being (an example often used is the purchase of 100 shares of stock for \$1,000 and the subsequent sale of that stock for \$1,000 - total sales are \$2,000, but *nothing exists in the form of income or benefit to the community*). A preferable

measure of economic change in the community is represented by income. The results of the modeling used for this presentation have been expressed in income dollars. For the tree fruit industry, the total output impacts are approximately double the income impacts.

Overall Impact Results Generated by the Tree Fruit Industry:

<u>Impact Location</u>	<u>Output Impact</u>	<u>Total Income Impact</u>
<u>Washington State</u>		
Impact on United States	\$8.5 billion	\$4,254,613,021
Northwest Region (WA, OR, & ID)	\$6.5 billion	\$3,288,632,945
State of Washington	\$5.6 billion	\$2,842,333,172
Yakima Valley Region (FRD 4)	\$2.1 billion	\$1,075,744,611
North Central Region (FRD 3)	\$1.5 billion	\$ 798,499,222
Columbia Basin Region (FRD 5)	\$820 million	\$ 409,606,035
Other FRDs (1,2,6, & 7)	\$350 million	\$ 178,890,063
<u>Oregon State</u>		
Oregon	\$630 million	\$ 314,962,038
<u>Idaho State</u>		
Idaho	\$101 million	\$ 50,448,898

For More Information Contact:

Jim Hazen, Washington State Horticultural Association - 509-665-9641
 Jim McFerson, Washington Tree Fruit Research Commission - 509-665-8271
www.wahort.org