

HONEY, NATURAL, NOT ELSEWHERE INDICATED OR SPECIFIED			DOMESTIC MERCHANDISE	
Canada	26,368	58,601	337,863	644,353
Mexico	—	—	46,474	50,849
Honduras	—	—	18,725	20,000
Costa Rica	2,449	5,780	2,449	5,780
N. Antilles	—	—	6,967	13,710
Aruba	—	—	1,000	2,616
Guadalupe	—	—	6,000	13,860
Ecuador	—	—	2,525	3,311
Iceland	—	—	163	2,644
Sweden	17,343	26,918	37,664	53,952
Belgium	18,787	27,242	18,787	27,242
Germany	171,168	237,046	577,680	795,464
Switzerland	—	—	17,026	32,055
Israel	—	—	17,061	24,260
Kuwait	—	—	19,582	25,686
Qatar	—	—	10,766	10,469
Yemen	51,312	53,000	92,607	137,760
Bangladesh	—	—	8,700	20,139
Malaysia	—	—	55,505	72,805
Indonesia	7,835	17,340	26,693	69,192
China	—	—	6,545	8,584
Korean Rep.	—	—	357,076	374,341
Hong Kong	—	—	5,023	10,803
Japan	—	—	61,528	97,162
Australia	—	—	35,586	62,490
TOTAL	295,262	423,927	1,769,995	2,577,527

HONEY, NATURAL, NOT ELSEWHERE INDICATED OR SPECIFIED			FOREIGN MERCHANDISE	
Canada	19,540	22,352	39,040	64,204
Mexico	—	—	31,463	101,016
Barbados	—	—	2,292	5,374
Philippines	—	—	10,954	31,532
Australia	—	—	19,517	25,600
TOTAL	19,540	22,352	103,266	227,726



Pacific Northwest Honey Bee Pollination Survey - 2000

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The year 2000 marks the 15th year that the Honey Bee Laboratory at Oregon State University has reviewed the pollination economics of commercial beekeeping in the Pacific Northwest (PNW). This is the eighth year for which combined data are given for the states of Washington and Oregon. With each year's information, the strength and importance of our region's beekeeping industry is highlighted. All participants in a regional agricultural industry need to understand the critical role played by beekeeping in overall agricultural production. This is especially true today with the increased costs and problems caused by the presence of honey bee mite parasites and the slowly expanding geographical range of our European honey bee's tropical "cousin" the Africanized honey bee, now recorded in five counties in southern California, as well as Texas, New Mexico, Arizona and Nevada.

The use of managed honey bee colonies for commercial crop pollination remains the most important function of the PNW beekeeping industry. The vast and diverse agriculture of the PNW relies on a healthy and strong beekeeping industry to maintain optimum production. An enhanced knowledge of pollination economics is critical to every beekeeper that enters into the world of commercial crop pollination. It is also important for those growers who contract honey bee colonies to understand current economic conditions of the beekeeping industry.

The 2000 survey provides data that continue to show a number of trends, one of which is the dependence of PNW commercial beekeepers on the income generated from colony rentals. For 2000 the average commercial beekeeper reported receiving 71.5% of his or her annual operating gross from pollination rental. This is down slightly from the record high figure of 72% reported in 1995. I am aware of no region in the U.S., or the world for that matter, where honey bee pollination rental is of such importance to the economic survival of a regional beekeeping community & of such benefit to the agricultural base that requires insect pollination for optimizing product yield. Even in California, the state with the largest & most varied beekeeping industry in the U.S., pollination rental income is just slightly over 51% of operational revenues (CA. State Beekeepers' Association 2000 pollination rental survey).

For a number years the average size of an individual commercial operation had increased. This trend of upward growth in the number of colonies has leveled off and the average commercial operation in 2000 was 2,055 hives, which is nearly identical to the average seen in the 1999 survey (2,058 colonies).

As in past years, the 2000 survey was sent to all Washington and Oregon beekeepers that registered more than 25 colonies with their respective state agriculture departments. A total of 21 commercial beekeepers returned completed surveys. These individual beekeepers collectively owned 43,160 colonies. A total of 101,712 colony rentals were reported for all respondents, which produced \$3,343,236 in rental income. The number of commercial survey returns was up for the year 2000, and, correspondingly, the number of colonies, hive rentals, and pollination income.

For 2000 the average pollination rental fee, computed from commercial beekeeper rentals on all crops reported, was \$32⁸⁵. This is a \$0.⁶⁵ (1.5%) increase from the average pollination fee charged in 1999 (\$32²⁵) (see Table 1 and Figure 1). The small increase from 1999 to 2000 is statistically insignificant, and really means that pollination rental fees were little changed from 1999.

Commercial beekeepers were responsible for 99% of all reported pollination rentals and a corresponding 99% of all pollination income. This is very similar to past years and shows how dominant commercial beekeepers are in the arena of large-scale agricultural pollination. The average pollination rental fee for semi-commercial beekeepers was \$27³⁰, which was for the year 2000 significantly lower than that charged by commercial beekeepers. For semi-commercial beekeepers the average per colony income was \$26⁸⁵. A semi-commercial colony, on average, was rented only once during 2000 which accounts for the large difference in the per colony income generation compared to a commercial hive.

For a commercial beekeeper the amount of income generated from pollination rental leveled off in 1997 & 1998, but dramatically increased in 1999 (\$183,780). For 2000 this figure was calculated to be \$159,057 for the average commercial operation; a 10% decrease from the previous year. During the past seven years the average rental fee has increased from \$28¹⁰ (1994) to \$32⁸⁵ (2000). It needs also to be pointed out that honey bee colony rental has for many decades been an underpaid service. It is really only within the past 7 or 8 years that rental fees have begun to more accurately reflect the enormous value-added service of managed pollination. This is shown by the 75% increase in the average pollination fee during the last decade; 1990 = \$18⁴⁰ to 2000 = \$32⁸⁵.

Within the PNW, tree fruits are the dominant crops for pollination income (see Table 2). In 2000 the combination of pears, sweet cherries & apples accounted for 49% of all reported rentals and 49% of all reported pollination income. Paradoxically, the single most important crop for PNW beekeepers is grown in California, *i.e.*, almonds. Almonds were responsible for 25% of all rentals and 29% of all rental income in this year's survey with almonds possessing the highest average pollination fee reported for 2000 (\$39⁰⁰).

More than 95% of all commercial colonies in Oregon and Washington are taken to California for almond pollination. In 2000 the combination of almonds and tree fruit accounted for 78% of all rentals and 78% of pollination income, which well illustrates the dominance and importance of these crops for a commercial PNW beekeeper.

For 2000 crops pollinated in the PNW, cranberry pollination provided the highest average fee at \$36⁷⁰ per colony rental. In terms of acreage, apples are the largest crop grown in the region and this is reflected by the large number of reported rentals (27% of all reported rentals and 26% of reported rental income). The crops with the lowest pollination fees are the legumes crimson clover and hairy vetch, both of which are grown as seed crops but are also traditional honey producers, hence historically low fees. Their significance to regional pollination income is really minor, in terms of rental income, the number of colonies involved, and the very regional nature of both crops (mid- to northern Willamette Valley).

Berry crops (blackberries, raspberries & blueberries), which as late spring to early summer bloomers and copious nectar producers (blackberries and raspberries), often produce honey crops as well as pollination fees. The 2000 average pollination fee for all combined berry crops was \$14³⁵, which is a dramatic decrease from the 1999 average of 28⁴⁰ per hive.

The crop with the most remarkable change from 1999 to 2000 was meadowfoam. From 21 commercial beekeepers there were only six reported rentals in 2000, which compares to the 3,830 rentals reported in 1999. The reason is simple, very little meadowfoam was grown in 2000 due to major financial disruptions in the meadowfoam industry within the Willamette Valley.

The average PNW commercial honey bee colony was rented 2.36 times in 2000 and this includes California almonds. This is a decrease from the 2.77 figure generated from the 1999 survey. With an average rental fee of \$32⁸⁵, this results in an annual per colony pollination income of \$77⁴⁰, which is an 13% decrease from the 1999 colony income statistic of \$89⁷⁰. This trend of reduced per colony rentals, along with the accompanying reduced colony income result in a lessening, or at least a stagnation in pollination "effort" on the part of regional beekeepers. Agriculture at-large is presently experiencing serious financial problems, and one needs only look to the apple and cranberry industries to see this. Beekeepers are knowingly reluctant to implement increased pollination fees to an already stressed agriculture industry.

The combined colony numbers from those commercial beekeepers who responded to the survey, (43,160 hives), represent approximately one-fourth of the commercial hives in Oregon and Washington. Therefore, if we multiply the pollination income (\$3,343,236) by a factor of 4, we have a ball park estimate of the pollination income generated by commercial beekeeping in the PNW, *i.e.*, more greater than \$13,000,000. This is less than 1.5% of the estimated farm-gate value of PNW crops that require or benefit from managed pollination. Pollination income in the PNW far exceeds the value of honey & wax sales for our regional beekeeping industry. Pollination rental income is frequently 4-5 times greater than honey & wax sales in any given year, a situation that is largely ignored by federal & state agricultural economists, who continue to rely almost solely on the sale of honey & wax as the yardstick for economic activity.

Please remember that much of the data presented here represent the pollination rental situation of the "average" commercial beekeeper. For individual beekeepers the survey results are most useful as benchmarks against which they should compare their individual operations.

While colony income from pollination rental is a critical statistic, so therefore is the annual cost to maintain a healthy hive of bees. Responses to this question on the survey have varied widely, often from a misunderstanding of what was being asked. However, numerous commercial beekeepers, who have over the years maintained excellent cost accounting records, have responded with numbers that are very reasonable relative to today's economy. The average annual hive maintenance cost was \$104⁵⁰ per colony for the year 2000, which is little changed from the \$104 reported for 1999.

It is very important to recognize that the average colony maintenance cost is higher than the average per colony pollination income by \$27¹⁰. This illustrates that operation profits are generated by other sources of income, most importantly, honey production. Basing wholesale honey prices at a conservative 50 cents per pound, the commercial hive must produce about 54# of honey in order to break even. When the average commercial beekeeper generates 71.5% of their income from pollination fees, that means, based on the data from the 21 responding beekeepers, that a colony will generate a gross income of \$108. This is \$3⁵⁰ more than the annual maintenance cost of that "average" hive, which represents a rather small operational profit, based on these per colony income statistics. Please let me stress again that all of these "projections" are only as accurate as the data provided by responding beekeepers. The projections also assume that the participating beekeepers collectively represent the mainstream of commercial beekeeping in the Pacific N. W..

I wish to again thank all those beekeepers in Oregon & Washington who took the time to participate in the survey, which has over the past 15 years, generated the most accurate assessment of commercial pollination known in the U.S.

Table 1. Average Pollination Fees 1990-2000

<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>
18.40	19.45	19.25	22.50	28.10	29.60	31.55	31.05	29.65	32.25	\$32.85

Table 2. 2000 Average Commercial Pollination Fees

<u>Crop</u>	<u>No. Rentals</u>	<u>Avg. Fee</u>	<u>Income</u>
Pears	15,290	\$31 ⁶⁵	484,006
Cherries	8,473	\$30 ⁷⁰	260,016
Apples	27,057	\$32 ⁷⁵	885,668
Berries ¹	5,086	\$14 ³⁵	73,062
Blueberries	3,290	\$28 ³⁰	93,123
Cranberries	2,442	\$36 ⁷⁰	89,608
Vegetable seed	7,626	\$34 ⁷⁰	264,619
Clover seed ²	1,593	\$31 ¹⁰	49,528
Radish seed	936	\$15 ²⁵	14,263
Cucumbers	1,684	\$33 ²⁵	55,962
Sq. & Pump. seed	1,221	\$32 ⁸⁵	40,082
Watermelon	852	\$35 ⁴⁵	30,204
Misc. ³	1,172	\$24 ⁹⁰	29,172
<u>Almonds</u>	<u>24,990</u>	<u>\$30⁰⁰</u>	<u>973,862</u>
SUM =	101,712		\$3,343,236

Average Pollination Fee = \$32⁸⁵

¹Includes blackberries, raspberries, marionberries, & loganberries.

²Includes red & white clover as grown for seed.

³Includes apricots, kiwi, meadowfoam, crimson clover, vetch & holly.

Table 3. Average colony numbers, average rental fee per hive & average annual rental income per hive for a commercial beekeeping operation in the Pacific Northwest 1992-2000.

<u>Year</u>	<u>Average No. Colonies</u>	<u>Average Rental Fee</u>	<u>Average Annual Rental Income per Colony</u>
1992	765	\$19 ²⁵	\$49 ⁷⁰
1993	990	\$22 ⁵⁰	\$62 ²⁵
1994	1,225	\$28 ¹⁰	\$78 ⁷⁰
1995	1,348	\$29 ⁶⁰	\$78 ¹⁵
1996	1,350	\$31 ⁵⁵	\$97 ⁵⁰
1997	1,504	\$31 ⁰⁵	\$92 ²⁰
1998	1,153	\$29 ⁶⁵	\$83 ⁰⁰
1999	2,058	\$32 ²⁵	\$89 ³⁰
2000	2,055	\$32⁸⁵	\$77⁴⁰

Summary Information - 2000

A total of **21** commercial beekeepers, owning **43,160** colonies returned survey forms.

A total of **101,712** colony rentals generated **\$3,343,236** in rental income.

The average per colony pollination rental fee (for all beekeepers, for all crops including California almonds) was: **\$32⁸⁵**

The average commercial colony was placed in **2.36** pollination sets in 2000, for an average per hive rental income of **\$77⁴⁰**.

The average commercial bee operation maintained **2,055** colonies and grossed **\$159,057** in pollination rental income for 2000.

A total of 17 semi-commercial beekeepers returned survey forms:

The average per colony pollination rental fee was: **\$27³⁰**

The average semi-commercial colony was placed in **0.98 (one)** pollination set in 2000, for an average Per hive rental income of **\$26.85**

The average semi-commercial operation maintained **78** colonies and grossed **\$2,094** in pollination rental income for 2000.