

**IMPORTS continued...**

Denmark	0	0	0	83	25,898	26,292
France	0	0	0	1,763	19,187	19,714
India	0	0	0	60	3,295	3,645
Italy	123	2,558	2,662	7,771	39,095	40,831
Malaysia	0	0	0	357	51,554	52,975
Mexico	5,253	119,837	120,639	54,322	952,805	961,945
Philippines	8,113	9,092	10,297	8,113	9,092	10,297
Poland	0	0	0	3,930	5,545	6,225
Sri Lanka	0	0	0	19,656	25,740	25,742
Switzerland	0	0	0	327	2,884	2,967
Taiwan	0	0	0	16,126	9,084	10,568
Thailand	19,810	16,940	20,163	37,818	63,590	70,022
United Kingdom	764	12,678	13,028	1,718	31,893	33,613
<b>SUBTOTAL</b>	<b>34,063</b>	<b>161,105</b>	<b>166,789</b>	<b>204,758</b>	<b>1,342,774</b>	<b>1,376,290</b>
<b>GRAND TOTAL</b>	<b>7,694,316</b>	<b>8,925,869</b>	<b>10,010,318</b>	<b>97,207,445</b>	<b>116,174,719</b>	<b>128,311,576</b>

\* Excluding Cook Islands, Niue and Tokelau

SOURCE: Department of Commerce, Foreign Trade Division

**Pacific Northwest Honey Bee Pollination Survey – 2005**

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Since 1986 the Honey Bee Laboratory at Oregon State University has conducted an annual survey of pollination economics in the Pacific Northwest (PNW). The information from each year of the survey has been made available both regionally and nationally. The information has proved to be valuable to individual beekeepers who generate income from pollination rental.

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 for managed pollination, to understand current economic conditions of the beekeeping industry.

The pollination requirement for commercial agriculture in the PNW is enormous. Between Washington, Oregon and Idaho there are ca. 355,000 acres of crops grown that require or benefit from managed honey bee pollination. The "farm-gate" value of those combined crops is approximately \$1,750,000,000! Nearly half of those acres and 60% of the dollar value is in one crop – apples.

The USDA National Agriculture Statistical Service estimates that there are 200,000 production honey bee colonies in the PNW. And with these numbers there are some interesting hypothetical calculations that can be made. If all growers were to rent 2 colonies for each acre of blooming crop (355,000 acres) the resulting pollination requirement would utilize 710,000 colony rentals. If we multiple this by the 2005 average colony rental fee (\$51<sup>30</sup>) it results in a potential pollination rental income of more than 36 million dollars. If we add to that the estimated almond pollination income (ten million dollars) we end up with a gross pollination income of 46 million dollars for PNW commercial beekeepers. Another way to look at this is how much pollination income should be produced from one commercial honey bee colony in one year? That figure is approximately \$230.

Comparing the hypothetical PNW rental income (36 million \$) to the farm-gate value of the crops pollinated in the PNW (1.75 billion \$) shows that the money spent by growers to insure adequate pollination is 2% of the value of total crop production. This is another impressive illustration of what a remarkable value pollination rental is to the commercial agricultural industry of the PNW.

This year's 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 2005 the average commercial beekeeper reported receiving 70% of his or her annual operating gross from pollination rentals. This percentage is higher than previous years. This increase is largely due to the very dramatic increase in the almond pollination rental fee for the 2005 pollinating season. In 2005 almond growers responded to a potential shortage of colonies by dramatically increasing the price they paid for pollination. Many commercial beekeepers in the PNW and elsewhere, observed serious autumn & early winter colony losses in 2004. This created a situation where a potential colony shortage was perceived by both beekeepers & almond growers for a crop with more than 550,000 bearing acres. The average almond pollination fee for 2005 was \$79<sup>40</sup>! This is a 63% increase from the 2004 average (\$48<sup>70</sup>).

For 2005 the average pollination rental fee, computed from commercial colony rentals on all crops reported (including almonds), was \$51<sup>30</sup>. This is an increase of almost 33% above the average pollination fee of 2004 (\$38<sup>65</sup>) (see Tables 1 and 2). This dramatic escalation is due to the large increase in the average almond pollination rental fee but most crops pollinated within the PNW also experienced rental fee increases.

With the exception of cucumbers, all reported crops saw significant increases in the average pollination fee received in 2005 compared to 2004 rental prices (see Table 2). Excluding almonds, the average rental increase for PNW crops in 2005 was 23.7%. The average increase for PNW tree fruit pollination was 21.7%. Was this a "shirt-tail" effect from the dramatic almond increase? At this time it is difficult to say, but should these prices remain stable or even increase in future pollination seasons, it would be safe to say that almond pollination fees have indeed influenced a price increase for the majority of PNW crops.

For a commercial beekeeper the gross amount of income generated from pollination rental leveled off in 1997 and 1998, but increased in 1999 (\$183,780). For 2005 this figure was calculated to be \$231,865. The increase results from a trend of increasing the size of individual operations and an increase in per colony pollination income.

During the past ten years the average rental fee has increased from \$29<sup>60</sup> (1995) to \$51<sup>30</sup> (2005). It needs to be stressed that honey bee colony rental has for many decades been an underpaid service to the agricultural industry. It is really only within the past ten years that rental fees have begun to more accurately reflect the enormous value-added service of managed pollination. This is shown by the 180% increase in the average pollination fee during the last sixteen years; 1990 = \$18<sup>40</sup> to 2005 = \$51<sup>30</sup>.

Within the PNW, tree fruits are the dominant crops for pollination income (see Table 2). In 2005 the combination of pears, sweet cherries and apples accounted for 58% of all reported rentals & 42% 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 33% of all rentals & 51% of all rental income in the 2005 survey. Almonds consistently have produced a high average pollination fee; for 2005 the average was \$79<sup>40</sup>. Based on beekeeper reports for contracted pollination for 2006, almond rental prices are expected to remain at a level greatly elevated from the average prices of the previous decade.

In 2005 the combination of California almonds and PNW tree fruit accounted for 91% of all rentals and 93% of pollination income, which illustrates the dominance and importance of these crops for a commercial PNW beekeeper. All other PNW cropping systems that utilize honey bee pollination contributed only 7% of a beekeeper's gross pollination income in 2005.

In 2005, for crops pollinated in the PNW, squash & pumpkin seed provided the highest average fee at \$47<sup>10</sup> per colony rental. In terms of acreage, apples are the largest crop grown in the PNW and this is reflected by the large number of reported rentals (58% of all rentals and 42% of the total reported rental income.)

Berry crops (blackberries, raspberries and blueberries), are late spring to early summer bloomers and copious nectar producers (blackberries and raspberries). The 2005 average pollination fee for all combined berry crops was \$30<sup>20</sup>, a lower price than the average fee because beekeepers have an expectation that a honey crop will also be produced.

The average PNW commercial honey bee colony was rented 2.2 times in 2005 and this includes California almonds. This is a slight increase from the past several years. This statistic had been dropping since 1999 when the average number of rentals per colony was 2.8. Does this actually reflect the real world situation? Are commercial beekeepers concentrating on almonds and PNW tree fruit (which historically provide the major sources of pollination income) and reducing the number of colonies involved in minor crop pollination? At this time our data are not able to provide a reasonable answer to this question.

For the 2005 pollination season an average rental fee of \$51<sup>30</sup>, combined with an average of 2.2 pollination sets per colony, results in an annual per colony pollination income of \$112<sup>85</sup>, which is up significantly from that of the past few years. With the "average" commercial operation running 2,055 colonies, a hypothetical 2005 gross pollination income for the "average" commercial beekeeper was \$231,906.

The combined colony numbers from those commercial beekeepers who responded to the 2005 survey, (23,285 hives), represent about 20% of the USDA's estimate of colony numbers in Oregon and Washington. Therefore, if we multiply the total reported pollination income (\$2,684,713) by a factor of 5, we have a ball park estimate of the pollination income generated by commercial beekeeping in the PNW, *i.e.*, a regional pollination income of approximately \$13,000,000. This is far more than the normal "estimates" assigned to the bee industry by agricultural economists, who, for reasons unexplained, usually do not even include pollination rental income in their estimates of the beekeeping industry economic status. Pollination income in the PNW far exceeds the value of honey and wax sales for our regional beekeeping industry. Pollination rental income is frequently three to four times greater than honey and wax sales in any given year.

The 2005 survey asked commercial beekeepers to report the total number of full-time or part-time employees working for their operations. The figure for the "average" commercial beekeeping operation in 2004 was 2.9 full-time employees; for 2005 it is 3.4 employees. Another interesting way to look at this is to ask the question "what is the 'colony equivalent'", meaning what is the number of colonies necessary to hire one full-time employee? That figure is very close to 1,500 colonies/employee in both the years 2004 and 2005.

While colony income from pollination rental is a critical statistic, so therefore is the annual cost to maintain a healthy hive of honey 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 good cost accounting records, have responded with numbers that are very reasonable relative to today's economy. The average annual hive maintenance cost was \$117 per colony for the year 2005 (highest reported per colony maintenance cost = \$155; lowest = \$75). This wide range suggests that beekeepers should try to be more precise in calculating their operational costs. If you can't answer the question of your operating cost on a *per colony basis* you should seriously re-evaluate your operational strategy.

It is important to recognize that the average colony maintenance cost is higher than the average per colony pollination income. From the 2005 survey pollination income was \$112<sup>85</sup>/colony and the colony maintenance cost was \$117; a difference of \$4<sup>15</sup> per colony. This illustrates that net operational profit is generated by sources of income outside of pollination rental, most importantly, honey production.

Remember that the data presented here represent the pollination rental situation of a hypothetical "average" commercial beekeeper in the Pacific Northwest. For individual beekeepers the survey results are most useful as benchmarks against which they should compare their individual operations. 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 Northwest. And as a further cautionary note for this 2005 report, total colony numbers (hence number of rentals) reported were only about half of those reported in recent years. Fewer larger scale beekeepers in Oregon and Washington participated in the 2005 survey. However, averages generated from a collective 52,000 rentals in 2005 are not insignificant.

I wish to again thank all those beekeepers in Oregon and Washington who took the time to participate in the survey, which over the past 19 years, has generated the most accurate assessment of commercial pollination known in the U.S.

**Table 1. Average Pollination Fee 1994-2005**

<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>
28.10	29.60	31.55	31.05	29.65	32.25	32.85	33.65	36.40	36.45	38.65	51.30

**Table 2. 2005 Average pollination fees by crop as reported by 14 PNW commercial beekeeping operations.**

<u>Crop</u>	<u>No. Rentals</u>	<u>Avg. Fee</u>	<u>Fee +/-<sup>1</sup></u>	<u>Income(\$)</u>
Pears	1,582	\$38 <sup>40</sup>	22.6%	56,912
Cherries	6,254	\$37 <sup>70</sup>	12.0%	235,912
Apples	22,658	\$36 <sup>90</sup>	30.6%	835,314
Berries <sup>2</sup>	634	\$30 <sup>20</sup>	31.8%	19,126
Blueberries	860	\$37 <sup>35</sup>	17.3%	32,128
Cranberries	56	\$30 <sup>00</sup>	25.0%	1,680
Vegetable seed	1,308	\$44 <sup>90</sup>	18.3%	58,712
Clover seed <sup>3</sup>	243	\$37 <sup>70</sup>	15.6%	9,160
Crimson clover seed	86	\$24 <sup>80</sup>	n/a	2,130
Radish seed	123	\$33 <sup>20</sup>	37.7%	4,081
Cucumbers	430	\$38 <sup>30</sup>	(21.9%)	16,470
Sq. & Pump. seed	383	\$47 <sup>10</sup>	48.1%	18,030
Watermelon	60	\$42 <sup>00</sup>	21.6%	2,520
Meadowfoam	330	\$36 <sup>55</sup>	n/a	12,060
Misc. <sup>4</sup>	88	\$37 <sup>45</sup>	n/a	3,296
Almonds	17,244	\$79 <sup>40</sup>	63.9%	1,377,182
<b>SUM = 52,399 rentals generating \$2,684,713</b>		<b>Average Pollination Fee = \$51.30</b>		
<sup>1</sup> 0% change from 2004 <sup>2</sup> Includes blackberries, raspberries, Marionberries & Loganberries.				
<sup>3</sup> Includes red & white clover as grown for seed. <sup>4</sup> Plums & sour cherries				

**Table 3. Average colony numbers, average rental fee per hive, and average annual rental income per hive for a commercial beekeeping operation in the Pacific Northwest 1992-2005.**

<u>Year</u>	<u>Average No. Colonies</u>	<u>Average Rental Fee</u>	<u>Average Annual Rental Income per Colony</u>
1992	765	\$19 <sup>25</sup>	\$49 <sup>70</sup>
1993	990	\$22 <sup>50</sup>	\$62 <sup>25</sup>
1994	1,225	\$28 <sup>10</sup>	\$78 <sup>70</sup>
1995	1,348	\$29 <sup>60</sup>	\$78 <sup>15</sup>
1996	1,350	\$31 <sup>55</sup>	\$97 <sup>50</sup>
1997	1,504	\$31 <sup>05</sup>	\$92 <sup>20</sup>
1998	1,153	\$29 <sup>65</sup>	\$83 <sup>00</sup>
1999	2,058	\$32 <sup>25</sup>	\$89 <sup>30</sup>
2000	2,055	\$32 <sup>85</sup>	\$77 <sup>40</sup>
2001	3,168	\$33 <sup>65</sup>	\$64 <sup>60</sup>
2002	4,255	\$36 <sup>40</sup>	\$63 <sup>75</sup>
2003	2,612	\$36 <sup>45</sup>	\$86 <sup>40</sup>
2004	3,555	\$38 <sup>65</sup>	\$74 <sup>60</sup>
2005	2,055	\$51 <sup>30</sup>	\$112 <sup>85</sup>

### Summary Information - 2005

Total number of participating commercial beekeepers = 14

Total number of colonies in the survey = 23,285

Total colony rentals = 52,339

The average per colony pollination rental fee (for all beekeepers, for all crops including California almonds) was: \$51<sup>30</sup>

The average commercial colony was placed in 2.2 pollination sets in 2005, for an average per hive rental income of \$112<sup>85</sup>

The average commercial bee operation maintained 2,055 colonies and grossed \$ 231,906 in pollination rental income for 2005.