

1996 Pacific Northwest Honey Bee Pollination Survey

by
Michael Burgett
Department of Entomology
Oregon State University
Corvallis, OR 97331

This is the eleventh 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 third 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 vital role played by beekeeping in 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 increasing geographical expansion of our honey bee's tropical "cousin" the Africanized honey bee.

The use of managed honey bee colonies for commercial crop pollination remains the most important function of our regional beekeeping industry. An enhanced knowledge of pollination economics is critical to every beekeeper who enters into the world of commercial crop pollination. It is also important for those growers who rent colonies to understand current economic conditions of the beekeeping industry.

This year's survey provides data that continue to show a number of trends, one of which is the ever increasing dependence of PNW commercial beekeepers on the income generated from colony rentals. For 1996 the average commercial beekeeper received nearly 60% of his or her annual operating gross from pollination rental. This is down from the 72% figure reported for 1995. This reduction is, at least in part, the result of the historically high prices beekeepers received for honey in 1996. Sideline beekeeping operations reported that pollination rental fees represent 30% of their annual gross revenue. For the past five years the average size of an individual commercial operation has been increasing; this was not so in 1996. This year the average commercial operation

reported 1,350 colonies compared to 1,348 for 1995; averages, which for statistical purposes, are identical.

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. Even in California, the state with the largest and most varied beekeeping industry, pollination rental income is just slightly over 50% of operational revenues.

As in past years, the 1996 year survey was sent to all Washington and Oregon beekeepers who registered more than 25 colonies with their respective state agriculture departments. A total of 38 beekeepers returned completed surveys. The 19 commercial beekeepers collectively owned 25,682 colonies and the 19 sideliners possessed 1,170 hives. A total of 81,843 colony rentals were reported for all respondents, which produced \$2,571,678 in rental income. The average pollination rental fee, computed from commercial beekeeper rentals on all crops reported, was \$31⁵⁵. This is a 7% increase from the average pollination fee charged in 1995 (\$29⁶⁰) (see Table 1). Commercial beekeepers were responsible for 97% of all reported pollination rentals and a corresponding 97% 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 amount of income generated from pollination rental is dramatically increasing. This is easily inferred from the parallel increases in the average rental income generated on a per colony basis (see Table 3). During the past five years the average per colony rental fee has grown from \$19²⁵ (1992) to \$31⁵⁵ (1996). Over the past five years the average annual revenue from pollination rental increased by a rather remarkable 246% (from \$37,993 in 1992 to \$131,625 in 1996). As economically wonderful as this appears, it needs to be remembered that colony maintenance costs and especially colony replacement costs are on a steep increase. Commercial pollinators require high colony numbers to survive, and replacement costs for the dramatic increase in colony losses, due in part to mite parasitism, is a heavy fiscal burden for all beekeepers. It needs also to be pointed out that honey bee colony rental has historically been an underpaid service for decades. It is

really only within the past five years that rental fees have begun to more accurately reflect the enormous value-added service of managed pollination.

For the PNW, tree fruits are the dominant crops for pollination income (see Table 2). In 1996 the combination of pears, sweet cherries and apples accounted for 40% of all reported rentals and 40% of all reported pollination income. Paradoxically, the most important pollination crop for PNW beekeepers is grown in California, *i.e.*, almonds. This single crop was responsible for 38% of all rentals and 44% of all rental income in this year's survey. Almonds also provided the highest average pollination fee of all crops reported (\$36²⁵). More than 95% of all commercial colonies in Oregon and Washington are taken to California for almond pollination.

For crops pollinated in the PNW, apples provided the highest average fee at \$32³⁰ per colony rental. In terms of acreage, apples are the largest crop grown in states of Washington and Oregon which is reflected in the large number of reported rentals (29% of all reported rentals and 30% of reported rental income). The combination of almonds and apples accounted for 68% of all rentals and 74% of pollination income for PNW beekeepers in 1996.

The crops with the lowest pollination fees are the legumes hairy vetch (\$4⁶⁰/colony) and crimson clover (\$7⁴⁰/colony), both of which are grown as seed crops and are also traditional honey producers, hence a historically low fee. The situation is similar for our berry crops, which as late spring to early summer bloomers and copious nectar producers, often result in honey crops as well as a pollination fee.

The average PNW commercial honey bee colony was rented 3.09 times in 1996 and this includes California almonds. With the average rental fee of \$31⁵⁵, this results in an average per colony pollination income of \$97⁵⁰, which represents a new record high. For sideliner beekeepers the corresponding figures are \$27⁶⁰ for the average rental fee, with the average sideliner colony being rented 2.17 times for an annual per colony pollination income of \$59⁹⁰. This lower colony pollination income reflects the reality that the majority of sideliner colonies are PNW residents and are not taken to California for almond pollination.

The combined colony numbers from those commercial beekeepers who responded to the survey (25,682 hives) represent a conservative one-fourth of the commercial hives in Oregon and Washington. Therefore if we multiply the pollination income (\$2,501,504) by a factor of 4, we have a ball park estimate of the pollination income generated by commercial beekeeping in the PNW, i.e., slightly more than \$10,000,000. This is less than 1% 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 and wax sales for our regional beekeeping industry. Pollination rental income is frequently two and a half times greater than honey and wax sales in any given year, a situation that is largely ignored by federal and state agricultural economists, who continue to rely almost solely on honey and wax sales as the yardstick for beekeeping economic activity.

It needs to be remembered that the data presented here represent the pollination rental situation of the "average" commercial and sideliners beekeeper. For individual beekeepers the data are most useful as a benchmark against which they should compare their individual operations.

Over the past few years honey bees have received a great deal of attention from the national media. Many stories have been and continue to be generated about the dire plight of the honey bee, our most valued and widely recognized beneficial insect. And there is no denying the serious losses of honey bees and beekeepers due to a combination of causes, most especially the heavy colony mortalities caused by parasitic mites. However, it is instructive to view the honey bee in the U.S. from three perspectives. The first is the wild honey bee population, which, in the presence of mites and without benefit of human caretakers, has indeed been dramatically reduced in population. Few accurate assessments exist for the current situation of wild honey bee colonies, but most experts will agree that the wild honey bee population has been reduced by as much as 80 to 95%. The second population of honey bees that has suffered greatly in the past decade has been the hives owned by hobby beekeepers. Beekeeping management skills vary widely among this largest of beekeeper groups. Those with insufficient knowledge, or the unwillingness to improve their management practices, have lost their bees. Again we have no accurate assessments for the reduction in hobbyist bees, but a figure of 50% would not be

unrealistic. The third, and final honey bee population found in America, is that which is controlled by commercial and sideliner beekeepers. This critically essential population of honey bees is larger, economically healthier, and more vital than ever before. The losses of colonies from the wild honey bee population and from within the hobbyist ranks has increased the potential value of every living honey bee hive. Commercial beekeepers have taken advantage of this opportunity.

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

Table 1. Average Pollination Fees 1986-1995

| <u>1986</u> | <u>1987</u> | <u>1988</u> | <u>1989</u> | <u>1990</u> | <u>1991</u> | <u>1992</u> | <u>1993</u> | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 14.75 | 16.15 | 17.50 | 16.05 | 18.40 | 19.45 | 19.25 | 22.50 | 28.10 | 29.60 | 31.55 |

Table 2. Commercial Pollination Review

| <u>Crop</u> | <u>No. Rentals</u> | <u>Avg. Fee</u> | <u>Income</u> |
|--------------------------|--------------------|--------------------------|---------------|
| Pears | 4,642 | \$30 ⁰⁰ | \$139,356 |
| Cherries | 3,555 | 30 ⁶⁰ | 108,660 |
| Apples | 23,269 | 32 ³⁰ | 751,864 |
| Berries ¹ | 4,538 | 19 ⁷⁰ | 89,350 |
| Blueberries | 1,787 | 23 ⁷⁰ | 42,360 |
| Cranberries | 1,450 | 30 ⁵⁰ | 44,200 |
| Vegetable seed | 3,417 | 31 ¹⁵ | 106,421 |
| Clover seed ² | 1,633 | 14 ³⁰ | 23,326 |
| Crimson clover seed | 666 | 7 ⁴⁰ | 4,932 |
| Vetch seed | 460 | 5 ⁶⁵ | 2,600 |
| Radish seed | 1,043 | 20 ⁸⁰ | 21,713 |
| Sq. & Pump. seed | 788 | 28 ²⁰ | 22,208 |
| Misc. ³ | 1,778 | 26 ⁹⁰ | 47,860 |
| Almonds | 30,273 | 36 ²⁵ | 1,096,654 |
| SUM | 79,299 | | \$2,501,504 |
| Average Pollination Fee | | \$31⁵⁵ | |

¹Includes blackberries, raspberries, marionberries, & loganberries.
²Includes red & white clover as grown for seed.
³Includes arrow-leaf clover seed, birds-foot trefoil seed, turnip seed, meadowfoam, & holly.

Table 3. Average colony numbers, average rental fee per hive, and average annual rental rental income per hive for a commercial beekeeping operation in the Pacific Northwest 1992-1996.

| <u>Year</u> | <u>Average No. Colonies</u> | <u>Average Rental Fee</u> | <u>Average annual Rental Income/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 |

Summary Information - 1996

A total of 38 beekeepers returned survey forms:

19 Commercial (> 300 hives) owning 25,682 colonies.

19 Side-liner (< 300 hives) owning 1,170 colonies.

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

\$31⁴⁰

The average commercial colony was placed in **3.09** pollination sets in 1996, with an average rental fee of **\$31⁵⁵**, for an average per hive rental income of **\$97⁵⁰**.

The average sideliner colony was placed in **2.17** pollination sets in 1996, with an average rental fee of **\$27⁶⁰**, for an average per hive rental income of **\$59⁶⁰**.

For 1996, **97%** of all pollination rentals were done by commercial beekeepers, who also accounted for **97%** of all reported pollination income.

The average commercial bee operation maintained **1,350** colonies and grossed **\$131,625** in pollination rental income for 1996.

The average sideliner bee operation maintained **90** colonies and grossed **\$5,391** in pollination rental income for 1996.