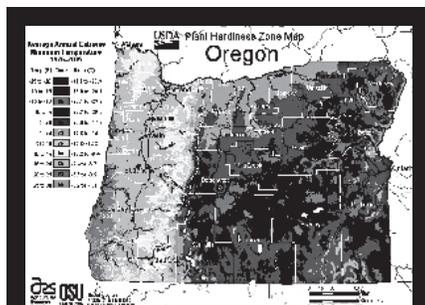


The Bee Line

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Image above: The newly released USDA Plant Hardiness Zone Map incorporates greater accuracy and detail as well as GIS-based interactive features. It now includes 13 zones and can be viewed at: <http://planthardiness.ars.usda.gov/PHZMWeb/>. A recent study indicates that both plants and bees have thus far adapted to changes in mean annual temperatures and the arrival of springtime.

OSBA WEBSITE: www.orsba.org
WEBKEEPER: Thom Trusewicz
cbees@gmail.com

OVERWINTERING LOSS SURVEYS OF OREGON BEEKEEPERS: WINTER 2010–2011

Dewey M. Caron and Ramesh Sagili

Note: This article is part of a larger study soon to be published in the *American Bee Journal*. It is provided here in two parts; the second will appear in the April 2012 issue.

The winter is a season of elevated risk in beekeeping, but recent seasonal losses have been unusually high. Significant regional colony losses with somewhat similar characteristics, labeled with a variety of names such as *spring dwindling*, *autumn collapse*, *May disease*, and other descriptive terms have occurred over at least 100 years of US beekeeping. One early documented loss, referred to as *disappearing disease*, occurred in 1915 in Portland, Oregon. Many of these reported instances, past and present, involve symptoms that included the sudden disappearance/ dwindling of large numbers of bee colonies with elevated seasonal losses.

As part of the Bee Informed Partnership (BIP), one of us (Caron) has been involved in documenting national losses over the last five years while Oregon State University (Sagili) has been analyzing beekeeper samples for overall health factors for the past two years. The initial national loss survey of spring 2007, conducted by the Apiary Inspectors of America in cooperation with the USDA, queried beekeepers in fifteen states and reported a loss rate of 31.8 percent. The 2007/2008 and 2008/2009 overwintering loss surveys included about 20 percent of the owners of US commercially managed colonies. Estimated colony loss rate was 35.8 percent in 2008 and 28.6 percent in 2009.

National electronic surveys were conducted by BIP during the first two weeks of April the past two years. The 2010 survey garnered responses from 4,027 beekeepers managing an estimated 17.7 percent of total managed bee colonies in the United States (survey included 49 Oregon beekeepers managing just slightly less than 31,000 colonies). Colony loss rate was 34.4 percent. The most recent survey (2011) tallied losses of 5,441 beekeepers managing an estimated 11.5 percent of total colony numbers (177 Oregon beekeepers, 168 of whom are small scale, are included in this national effort with slightly over 20,000 colonies). This past winter's national survey reported a 29.2 percent loss rate. Clearly such loss levels are of great concern and unsustainable in the long run.

To date, no single factor has been identified as the reason for the elevated losses documented since the winter of 2006/2007. Although pathogens are identified in killing of both brood and adult bees, the reasons why honey bees appear to be so susceptible to the pathogens is a source of considerable debate and study. Pesticide exposure, colony stressors, viruses, Nosema, and Varroa have all been implicated and are most likely interconnected in some yet-to-be understood negative way. Losses in one area or region in the world may not necessarily be due to the exact same set of conditions compared to other regions. Keeping Varroa levels below 5

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Overwinter Losses—Continued from page 1

percent infestation level seems to mean lower loss levels for individual beekeepers.

Prior to the appearance of the two honey bee mite parasites *Acarapis woodi* and *Varroa destructor* in the mid- to late-1980s, beekeepers typically had winter losses of 10–15 percent. The introduction of bee mites caused loss rates to increase substantially. A ten-year study (1989–1998) of Pacific Northwest (PNW) beekeepers by OSU’s Michael Burgett reported an average annual ten-year loss rate of 22.6 percent among commercial/semi-commercial beekeepers, with rates trending upward over the ten-year period.

Bee personnel at OSU, initially Burgett, followed by Caron, and now Caron and Sagili, began documenting, parallel with the national surveys, bee losses by PNW beekeepers. In the winter of 2007/2008, fourteen commercial and eleven semi-commercial beekeepers (owning an estimated 68 percent of the total colonies in Oregon and Washington) had a 30 percent loss rate. For the 2008/2009 winter, twelve commercial and twenty-two semi-commercial beekeepers had a lower loss rate of 21 percent. An additional survey form, distributed to attendees at 2009 local Oregon bee association meetings west of the Cascades, revealed a 25.8 percent spring loss rate from 100 small-scale beekeepers. The median beekeeping experience of this group was three years and

median number of colonies was two; the largest number of colonies owned by a single beekeeper in this small-scale group was forty-five.

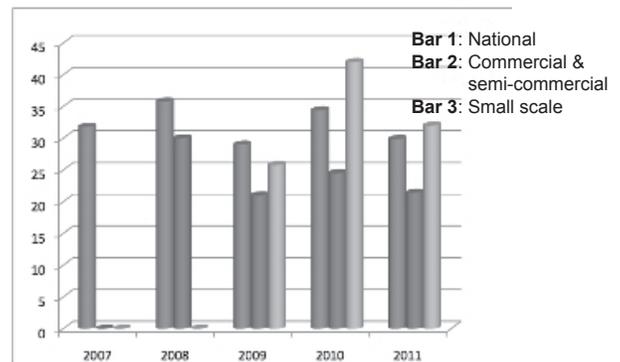


FIGURE 1. National bee losses: 2007 = 31.8%, 2008 = 35.8%, 2009 = 29%, 2010 = 34.4%, and 2011 = 29.9%. Four-year summary commercial and semi-commercial Oregon beekeepers: 2008 (n = 25, 62,100 colonies) lost 30%; 2009 (n = 34, 39,252 colonies) lost 21%; 2010 (n = 29, 37,138 colonies) lost 24.5%, and 2011 (n = 25, 57,022 colonies) lost 21.4%. Two-year summary small scale beekeepers: 2009 Oregon (n = 100) lost 25.8%, 2010 Oregon/Washington (n = 125) lost 42%, and 2011 Oregon (n = 102) lost 32%.

An oscillation of heavy losses one year followed by lighter losses the subsequent year has continued for Oregon commercial and semi-commercial beekeepers (see Figure 1). This same pattern of higher followed by lower loss levels has been found in Germany (German Bee Monitoring Program) and by Caron during ten-year sampling on the East Coast.

—To be continued—