USDA United States Department of Agriculture

ARS

# FOUR DECADES WITH BLUE ORCHARD BEES

BOB

## LOGAN BEE LAB

Measuring yields


Logan Bee lab

Watching bobs in cages

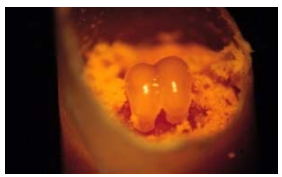
Nesting observation

bob pupa

Greenhouse management

Monitoring development

Testing shelter types



Feeding larvae

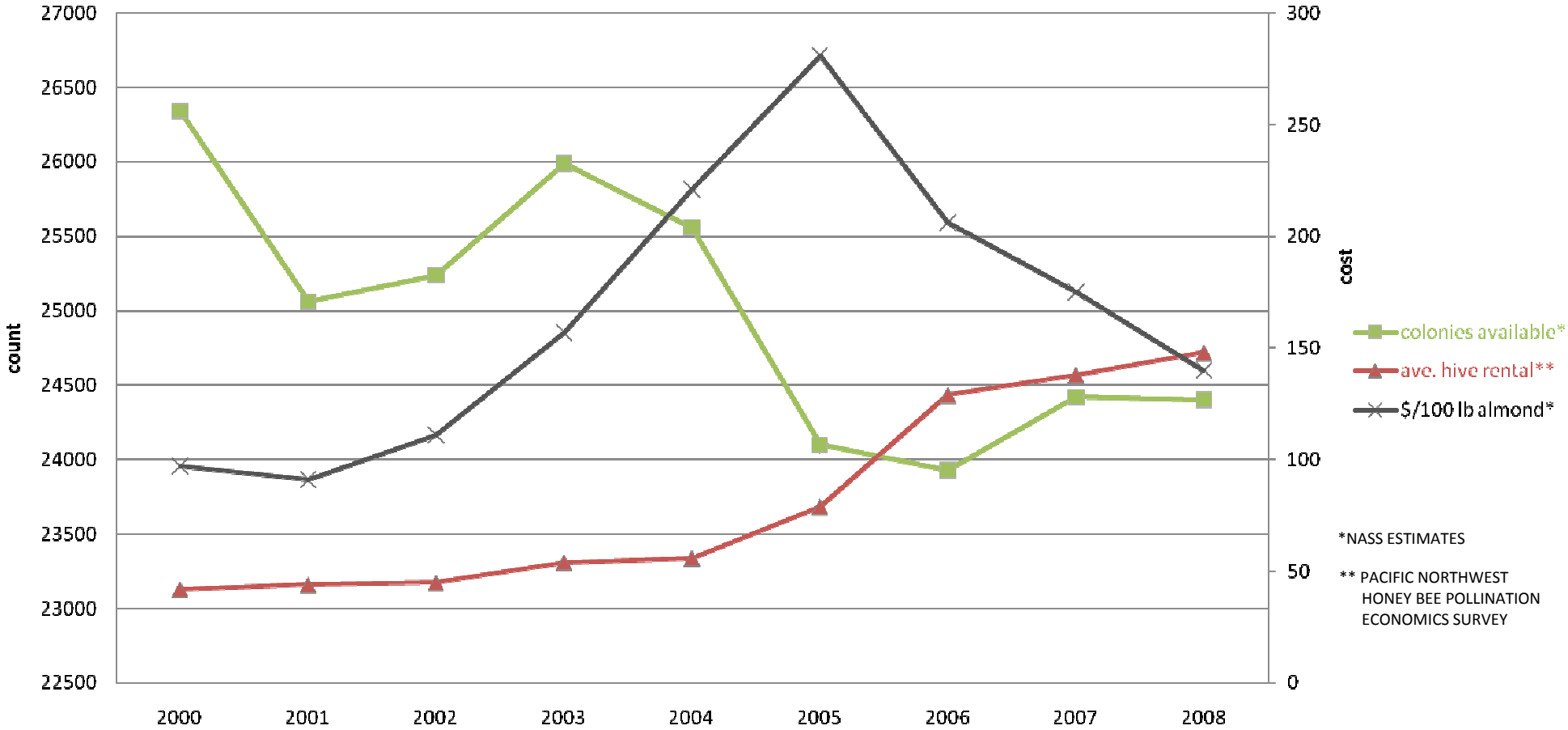
Field management

Recording nest contents

Mites on bob

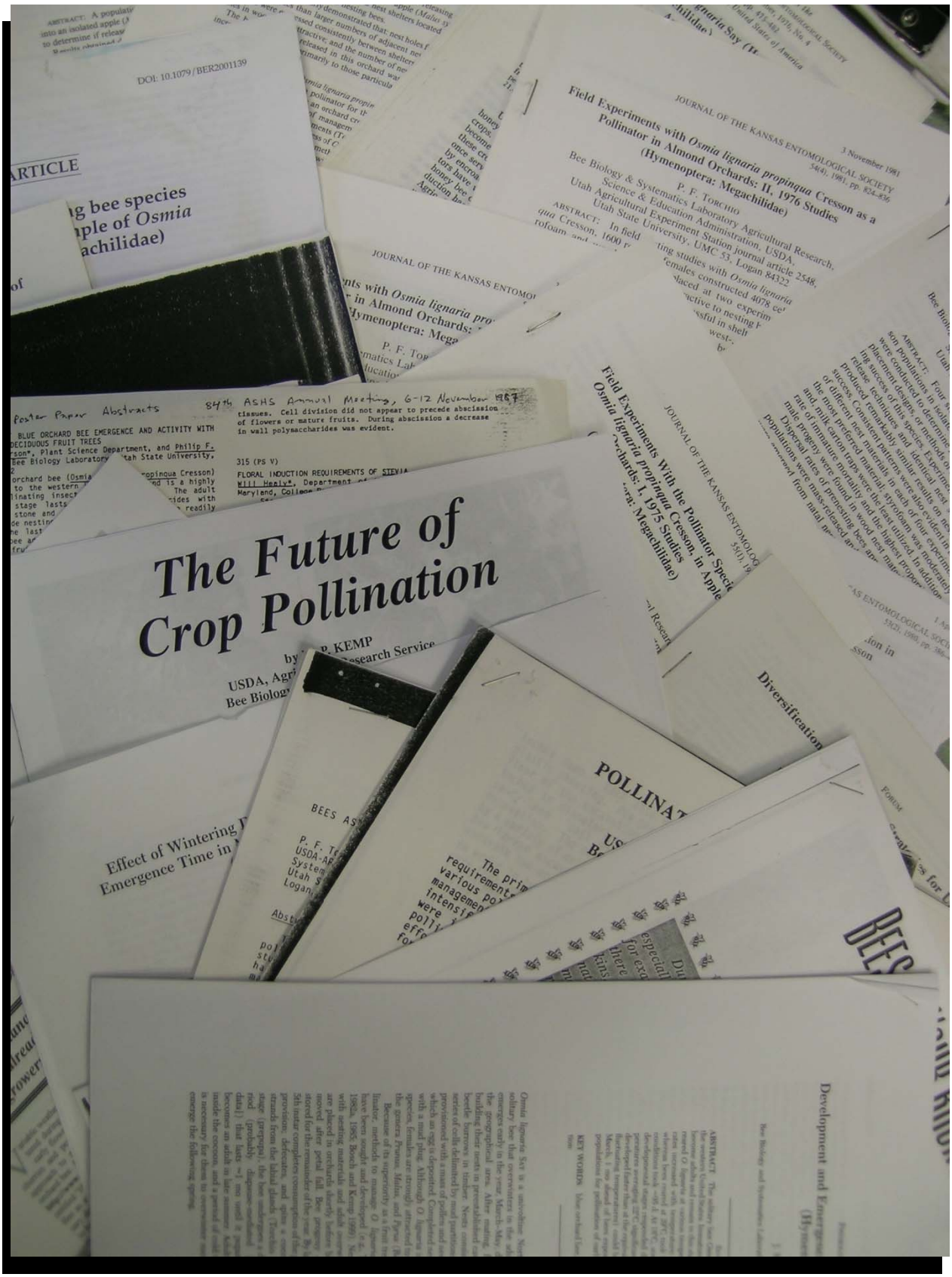
Flower counts

# ECONOMICS OF LACK OF DIVERSITY



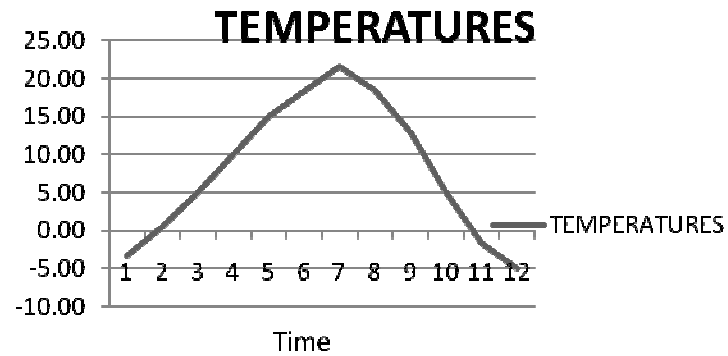

The average hive maintenance cost was $178/colony (in 2008).
Annual pollination income was $154/colony.
A net hive rental loss of $24. - Michael Burgett (Oregon State U.)

Total standing acreage 2008 – 665,576


DOI: 10.1079/BER2001139
ARTICLE
Field Experiments with Osmia lignaria propinqua Cresson as a Pollinator in Almond Orchards: II, 1976 Studies (Hymenoptera: Megachilidae)
P. F. TORCHIO
Poster Paper Abstracts
84th ASHS Annual Meeting, 6-12 November 1987
The Future of Crop Pollination
Diversification
POLLINAT
BEES AS
Development and Emergence

NESTING MATERIALS

TEMPERATURE REGIME




REDUCE NEST ASSOCIATES

Predators

Parasites

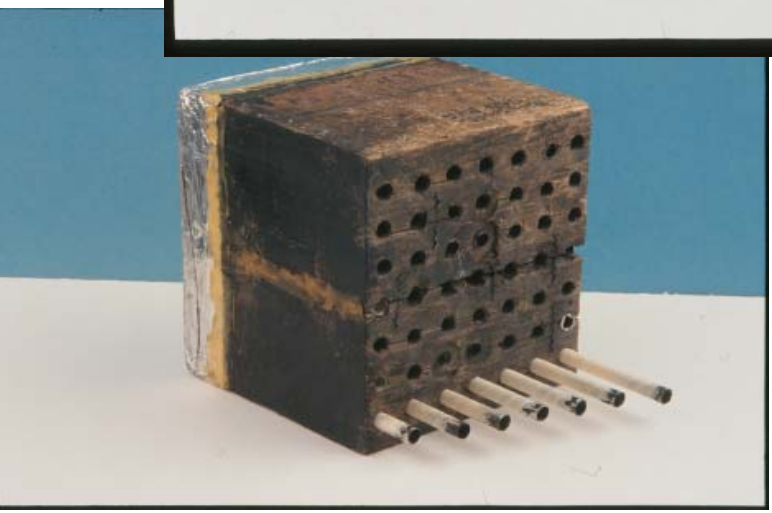
scavengers

# NEST MATERIALS

Thick tubes

Holes ¾” apart, $^{19}/_{64}$” diameter

6” deep holes



Sealed backs

Breathable material

Face Southeast

Partial afternoon shade

Protect from rain

3 holes per female released

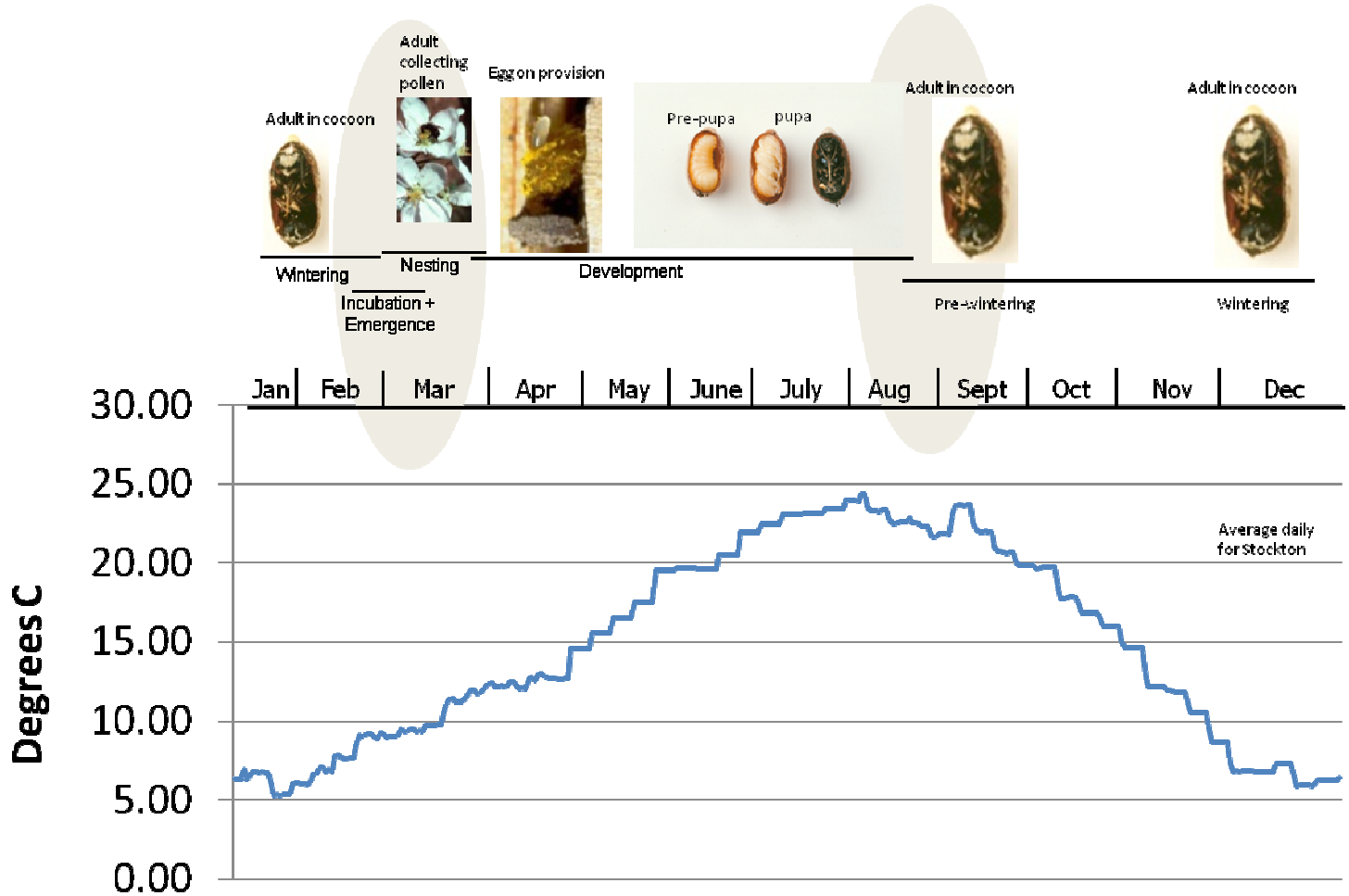
# TEMPERATURE REGIMES


Respirometer measuring $O_2$ and $CO_2$ of individual bees

Natural temperatures

Temperature cabinets

# TEMPERATURE AND DEVELOPMENT



# COMMON PREDATORS & PARASITES

## Parasitoids

Leucospis

Monodontomeris

Melittobia

## Pathogen

chalkbrood

## Cleptoparasites

Chrysura

Sapyga

Stelis

Tricrania

## Nest scavengers

Dermestid

Tribolium

Mites

Ptinis

## Predators

Trichodes

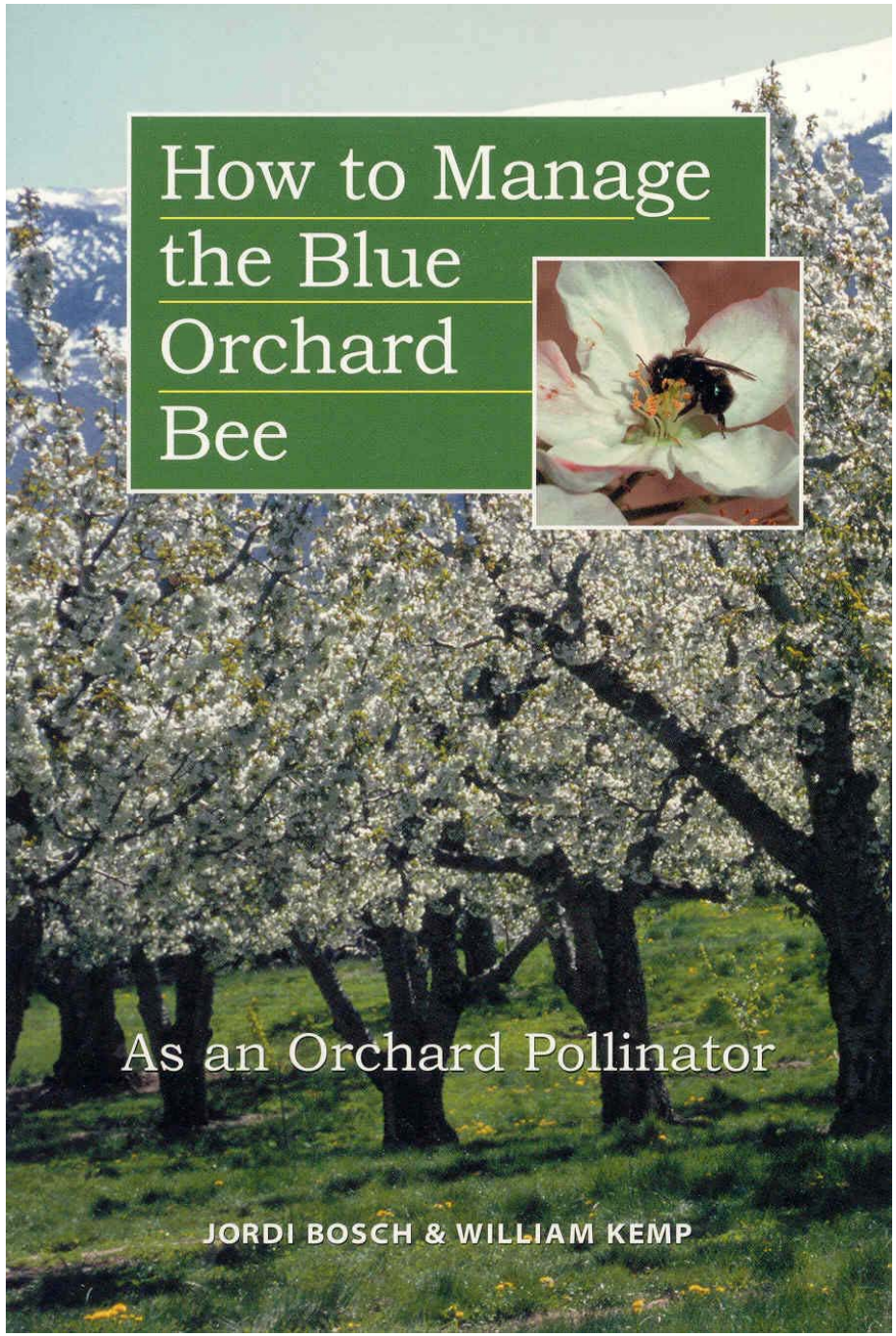
Fence lizard

robin

Field mouse

# CHERRY YIELDS OVER TIME

| Year | Pollinator | Cherry Yield (Kg.) | O. lignaria (Factor increase) | population compounded (6,000start) |
|---|---|---|---|---|
| 1992 | *A. mellifera* | - | - | |
| 1993 | *A. mellifera* | *3,040* | - | |
| 1994 | *A. mellifera* | *5,545* | - | |
| 1995 | *A. mellifera* | *4,820* | - | |
| 1996 | *A. mellifera* | *3,695* | - | |
| 1997 | *A. mellifera* | - | - | |
| **1998** | ***O. lignaria*** | ***14,875*** | ***5.44*** | ***32,400*** |
| **1999** | ***O. lignaria*** | ***4,150*** | ***2.17*** | ***70,308*** |
| **2000** | ***O. lignaria*** | ***16,935*** | ***4.21*** | ***295,997*** |
| **2001** | ***O. lignaria*** | ***4,415*** | ***1.03*** | ***304,877*** |
| **2002** | ***O. lignaria*** | ***-*** | ***2.45*** | ***746,948*** |
| **2003** | ***O. lignaria*** | ***6,680*** | ***0.73*** | ***545,272*** |




For more details on management – *How to Manage the Blue Orchard Bee* is available for free in PDF format at: http://www.sare.org/publications/bob.htm

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# Orchard management

3 acre apple orchard, 1984

200 acre almond orchard, 2009

## 2010 and beyond