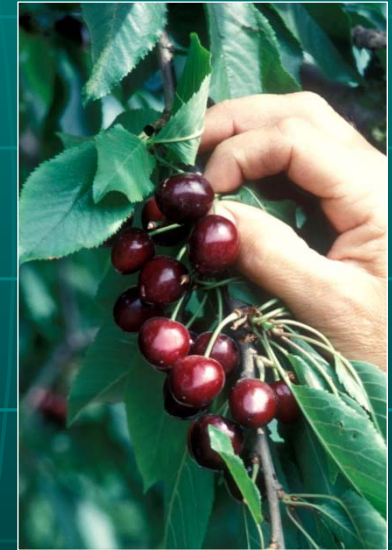


Sweet Cherry Production and Marketing



Joe Grant
Farm Advisor
UC Cooperative Extension
San Joaquin County



22nd California Small Farm Conference
Sacramento

March 1, 2009

Growing Sweet Cherries

- California Cherry Industry
- The FOUR "S"s
 - Site
 - Scion
 - Stock
 - System
- Pests, Diseases & Abiotic Disorders



Trends in California Cherry Production

- Diversification of varieties and growing areas
- Consolidation in packing and marketing sectors
- Consumer packaging
- “The era of acceptability of 11 row and smaller cherries is at its end”
- Emphasis on quality, grade standards

42°

40°

38°

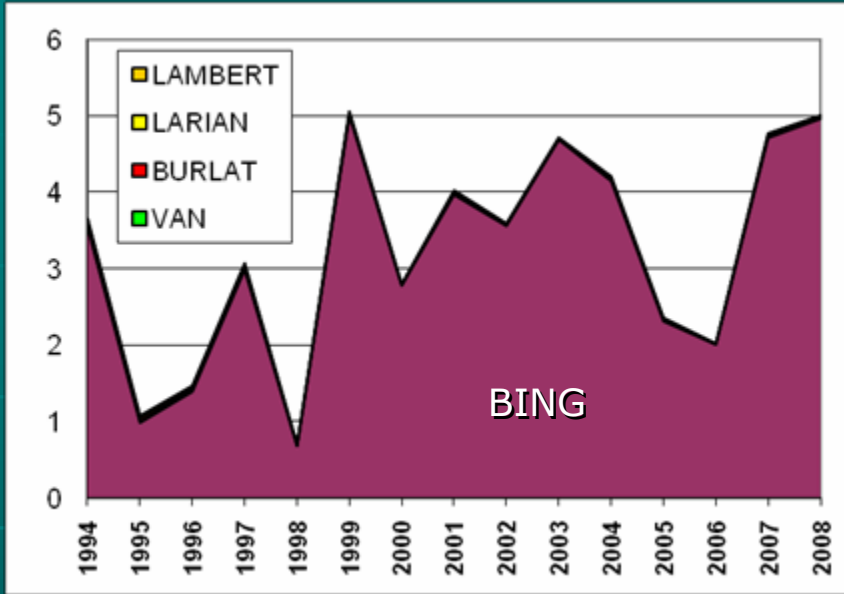
36°

34°

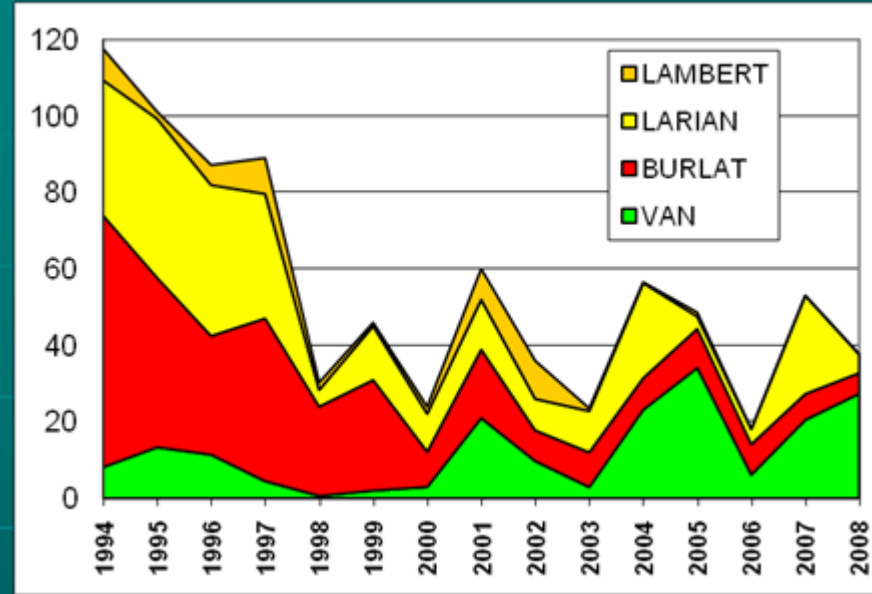


"Standard" varieties

Million boxes

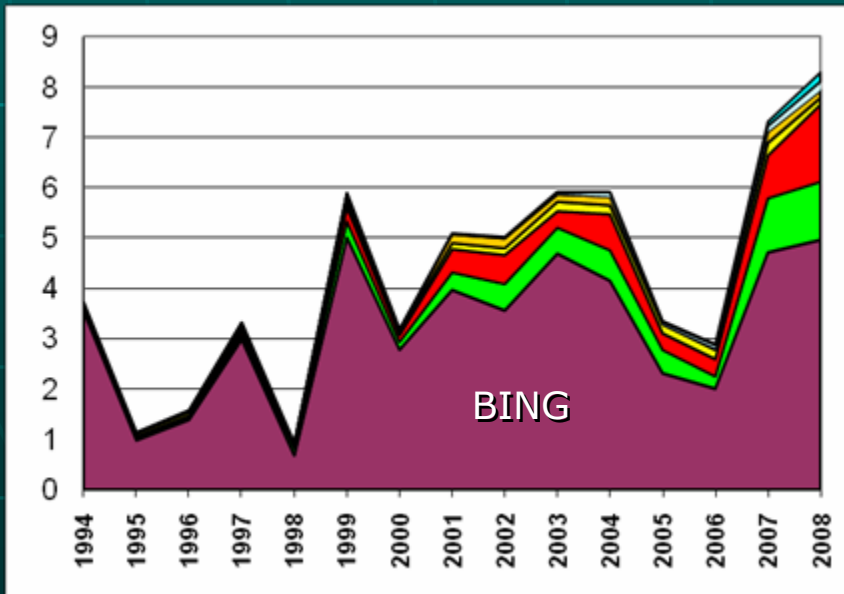


Thousand boxes

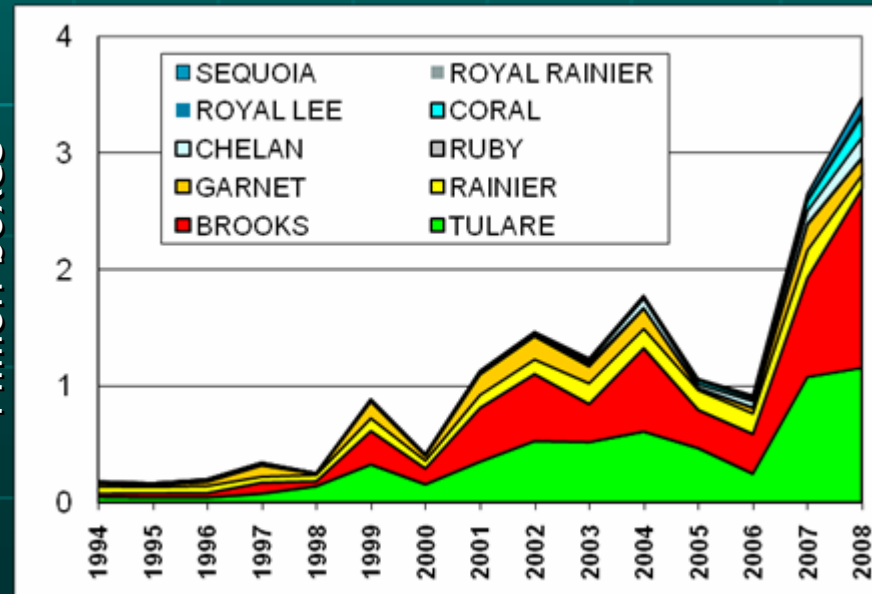


"Growth" varieties

Million boxes

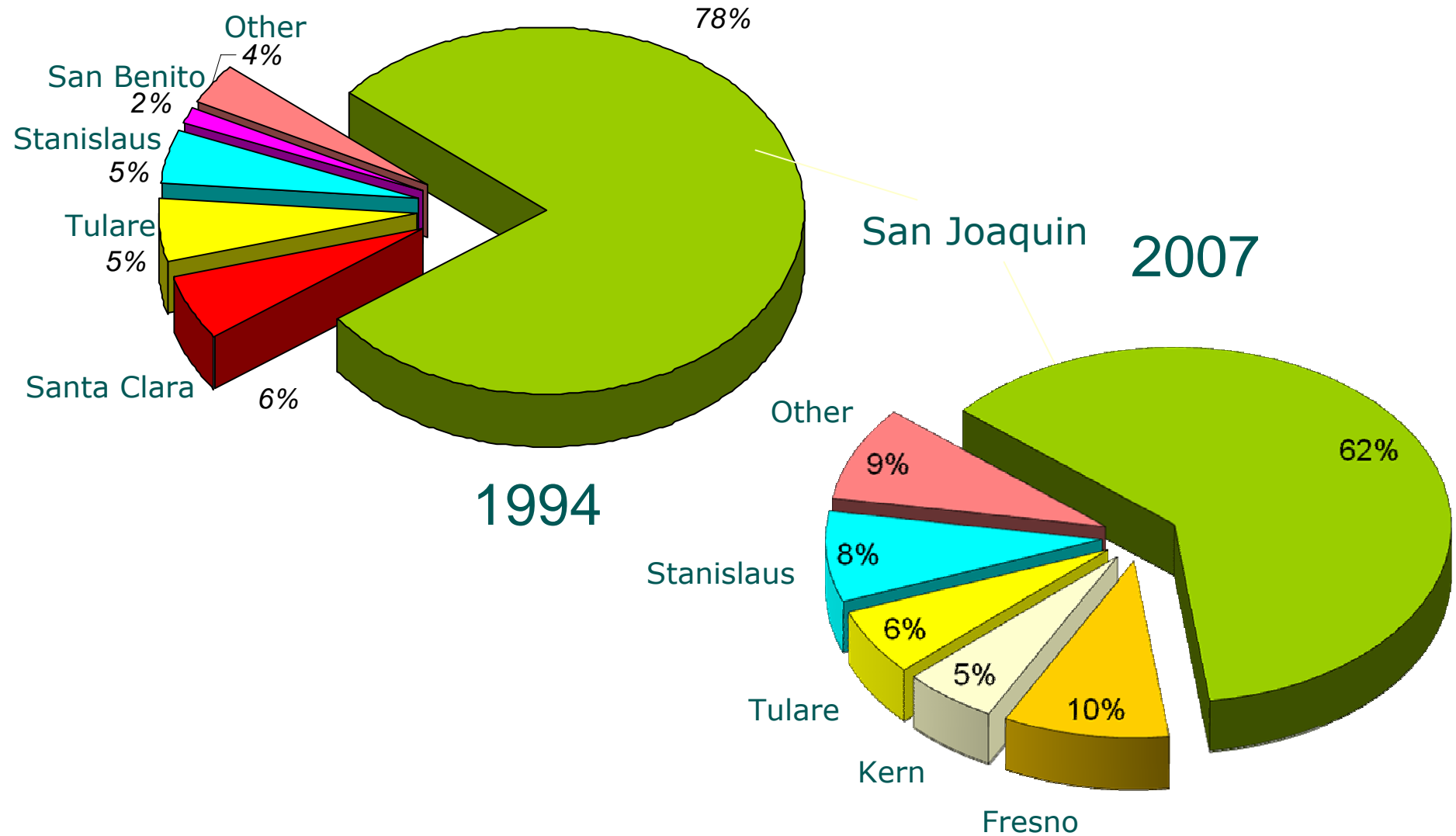


Million boxes

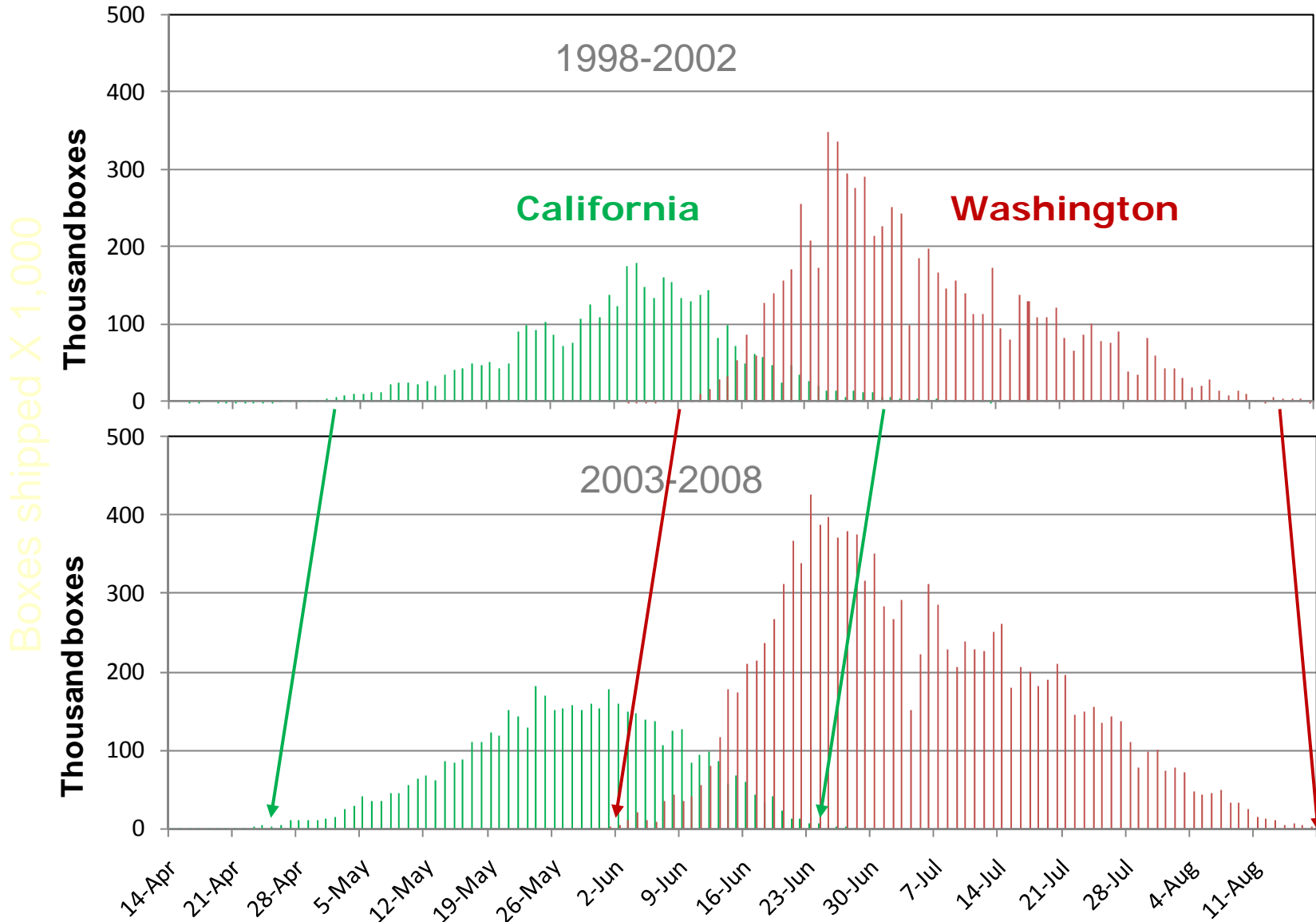


Leading Cherry Counties

Gross Sales Value



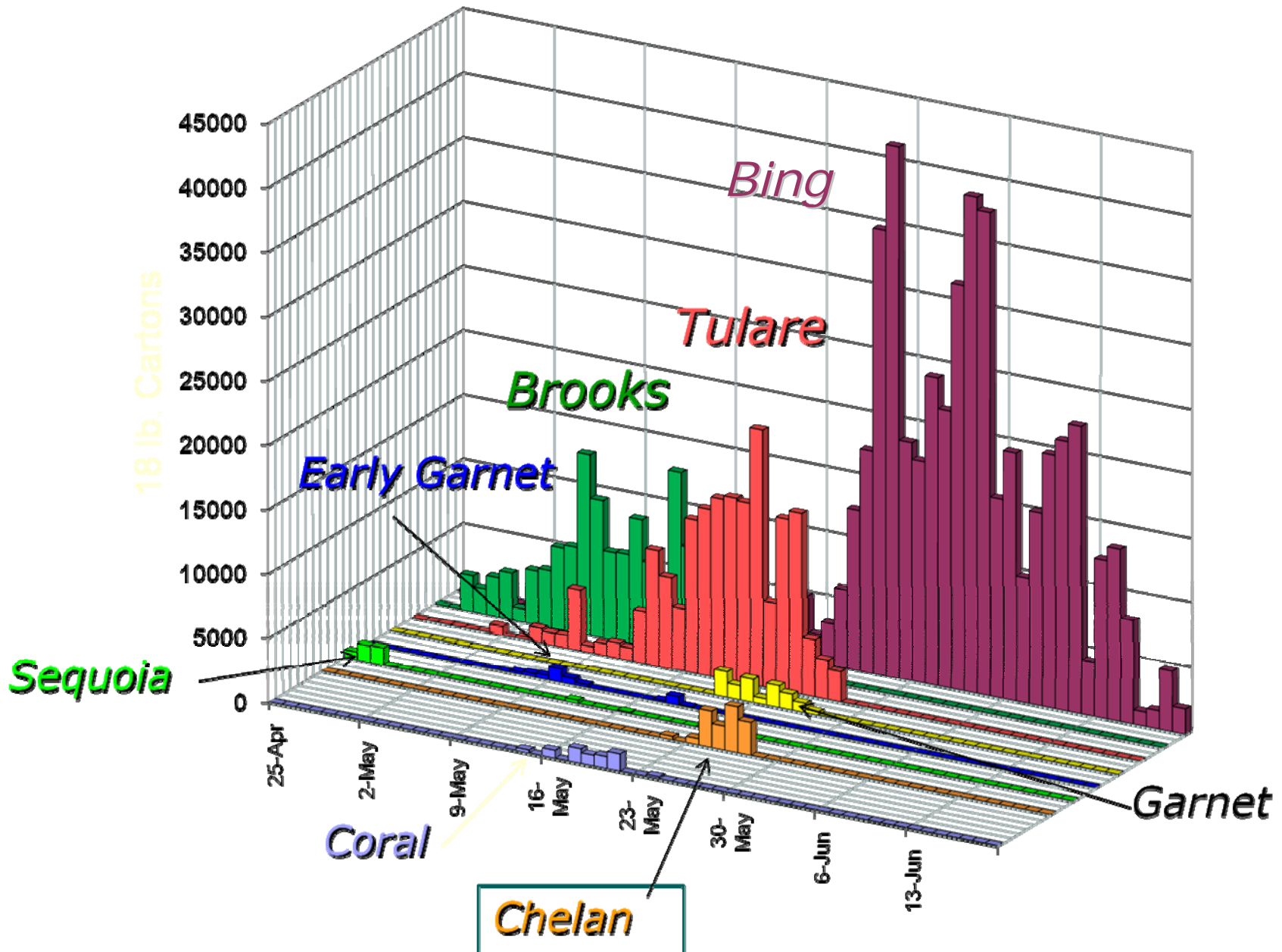
Daily Shipments, 5-year avg.



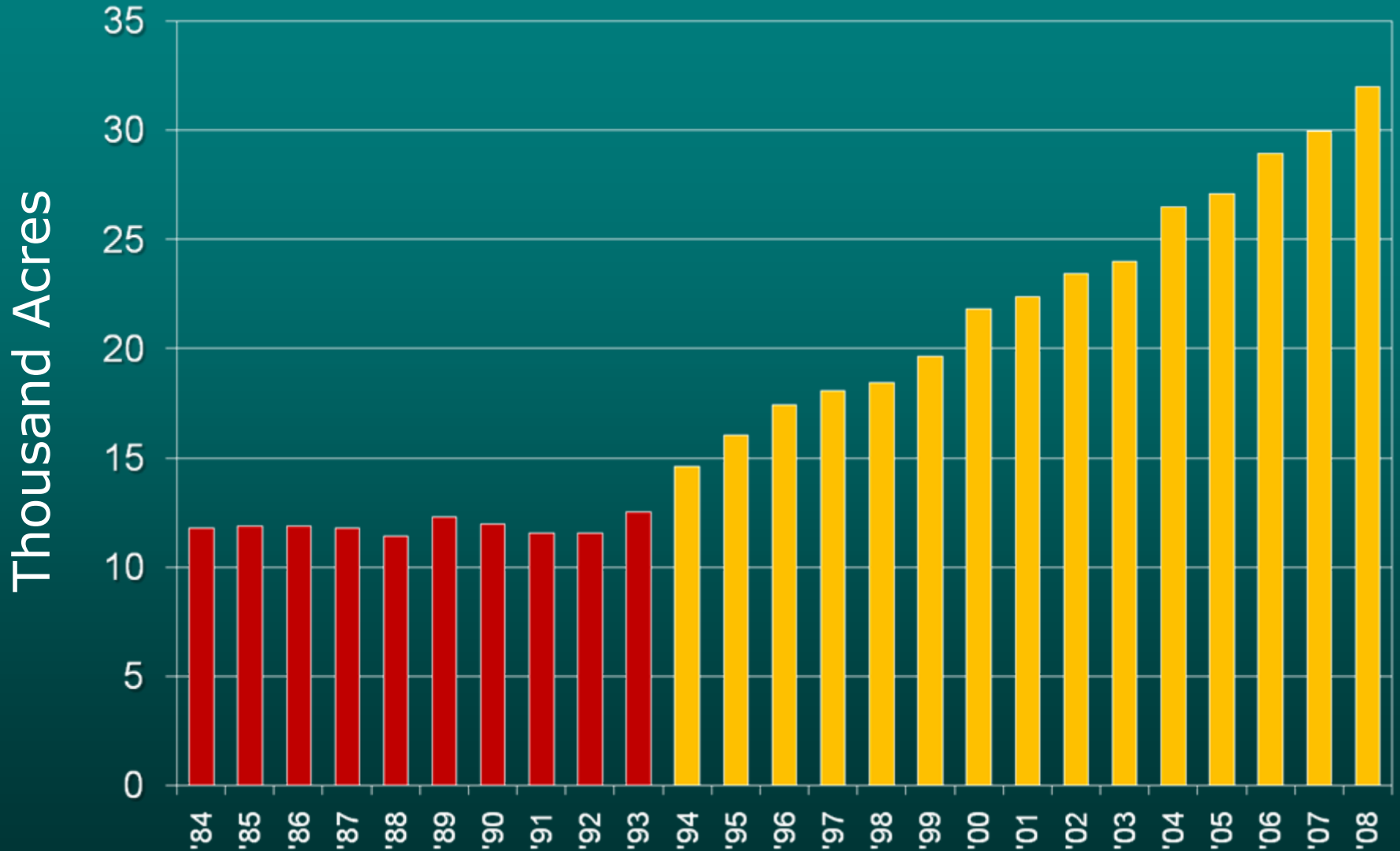
CA in 18 lb. equivalents, WA in 20 lb. equivalents

Source: CCAB

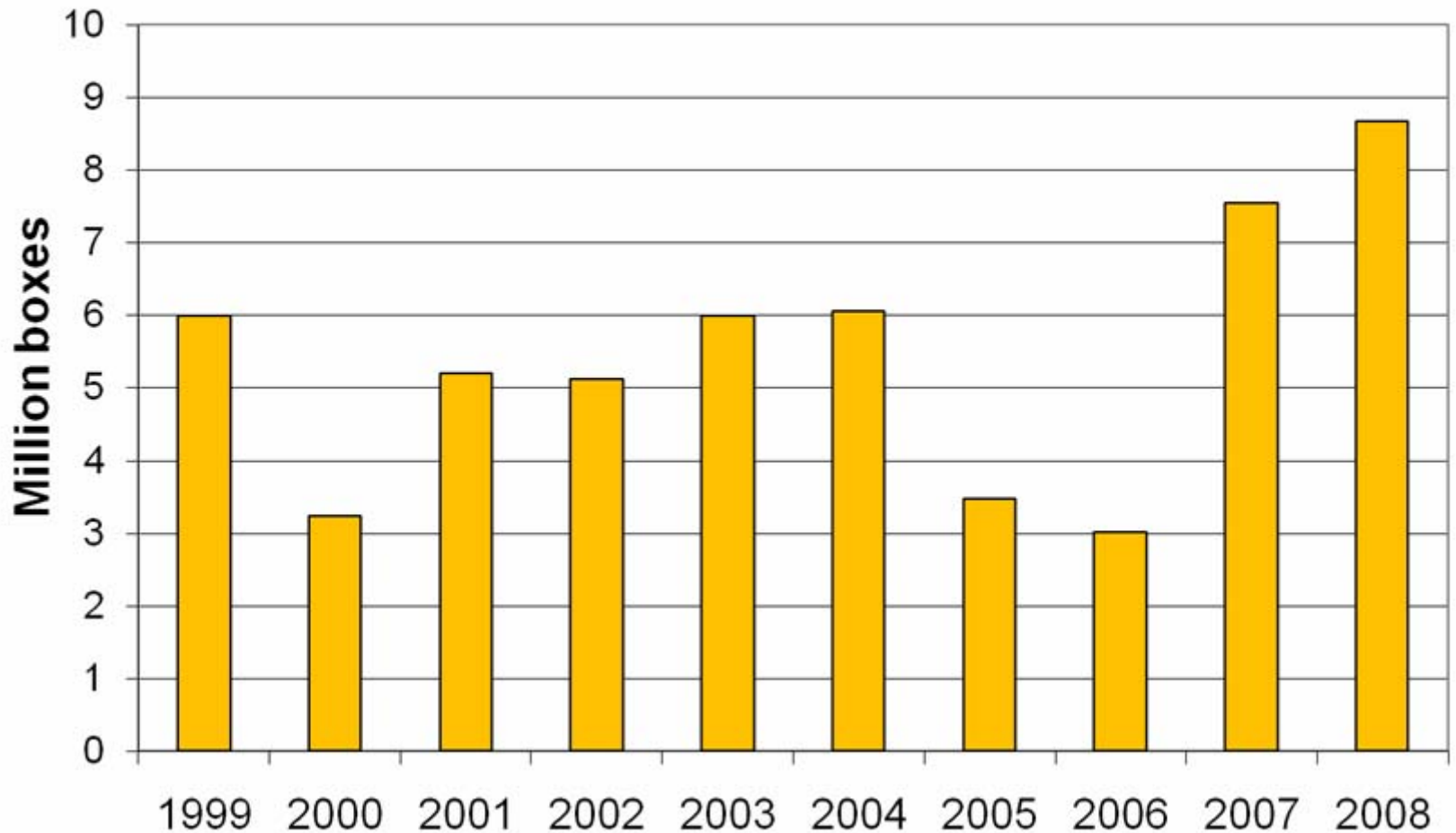
“FOR JAPAN” Shipments, 2008



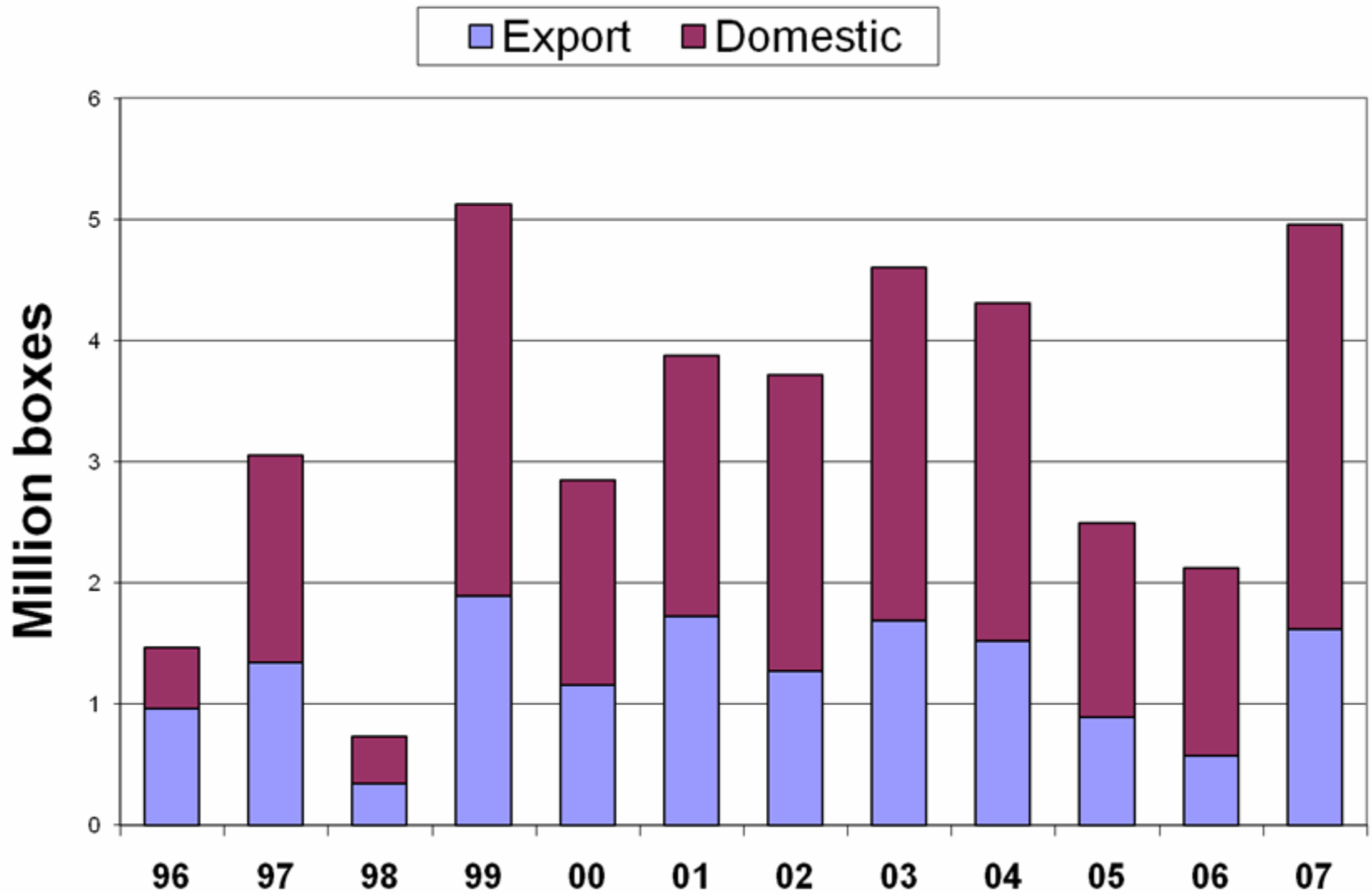
Sweet Cherry Acreage in California



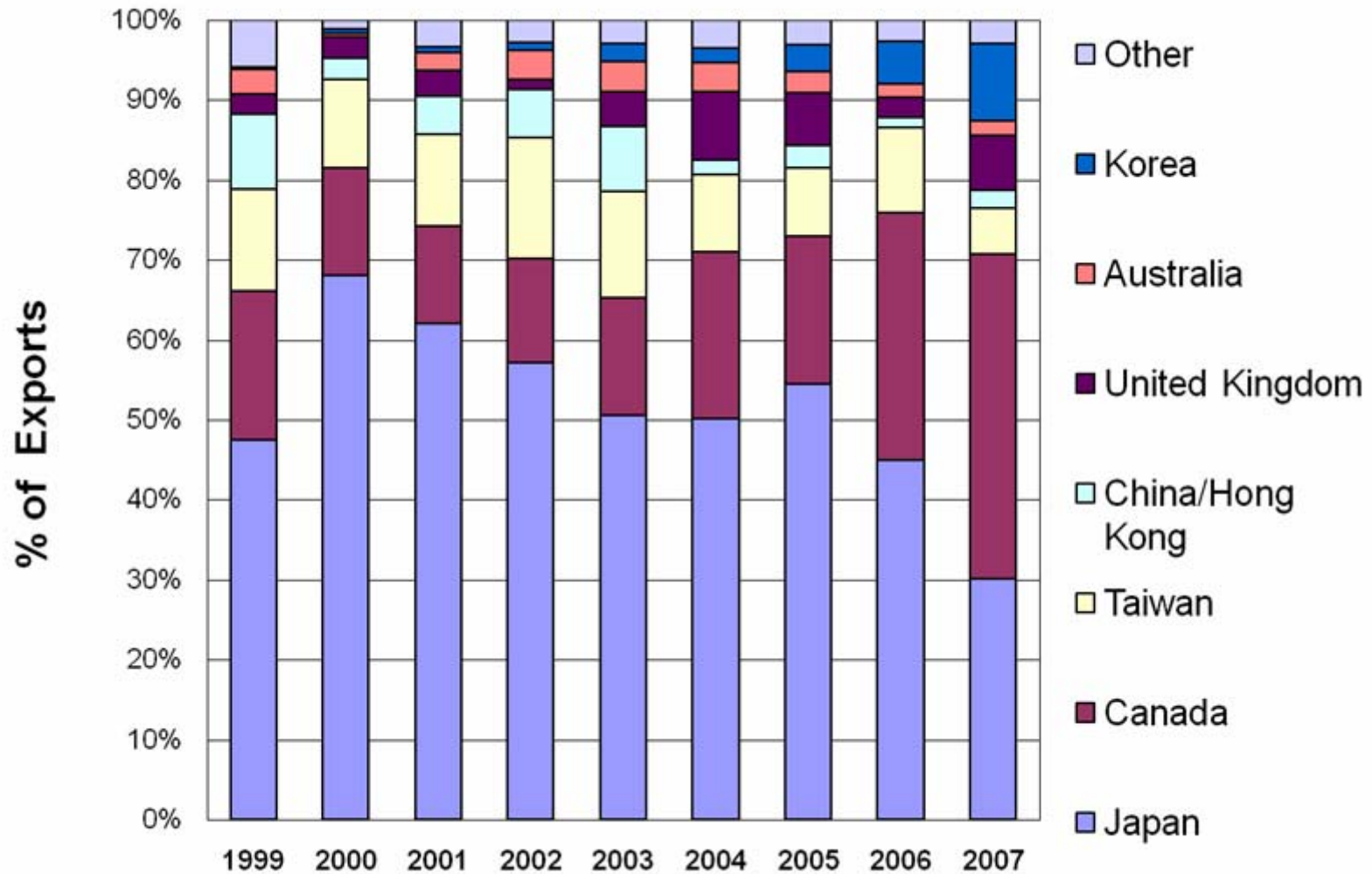
California Cherry Shipments Domestic & Export



Total vs. Export Shipments



Major Export Destinations



Cherry Orchard Site Selection

Cherries DO NOT LIKE:

- “Wet feet”
- Very low or high pH
- Salts
- Ring, Root Knot, or Root Lesion nematode
- Lack of chilling
- Frost
- Rain at bloom or harvest



Sweet Cherry Varieties and Rootstocks



Sweet Cherry Varieties

packed by California shippers

AARON G

ANDY G'S SON

ANGELO

BLACK REPUBLICAN

BING

BROOKS

BURLAT

CASHMIRE

CHELAN

CHINOOK

CORAL CHAMPAGNE

EARLY BING

EARLY SWEET

FIESTA

FLAVOR GIANT

GARNET

GIANT RUBY

HANFORD

INDEX

JUBILEE

KING

LAMBERT

LAPIN

LARIAN

LODI

LONG STEM

MINNIE ROYAL

MONA

MOREAU

PRETTY BABY

PRETTY BOY

RAINIER

ROYAL ANNE

ROYAL LEE

ROYAL RAINIER

ROYAL SWEET

RUBY

RUBY BING

SCARLET

SOUTH

SUNBURST

SWANSON

SWEET HEART

TART

TIETON

TULARE

UTAH GIANT

VAN

VISTA

Sweet Cherry Varieties

packed by California shippers

60-70%

AARON G

ANDY G'S SON

ANGELO

BLACK REPUBLICAN

BING

BROOKS

BURLAT

CASHMIRE

CHELAN

CHINOOK

CORAL CHAMPAGNE

EARLY BING

EARLY SWEET

FIESTA

FLAVOR GIANT

GARNET

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RAINIER

ROYAL ANNE

ROYAL LEE

ROYAL RAINIER

ROYAL SWEET

RUBY

RUBY BING

SCARLET

SOUTH

SUNBURST

SWANSON

SWEET HEART

TART

TIETON

TULARE

UTAH GIANT

VAN

VISTA

Sweet Cherry Varieties

packed by California shippers

96-98%

AARON G
ANDY G'S SON
ANGELO
BLACK REPUBLICAN
BING
BROOKS
BURLAT
CASHMIRE
CHELAN
CHINOOK
CORAL CHAMPAGNE
EARLY BING
EARLY SWEET
FIESTA
FLAVOR GIANT
GARNET
GIANT RUBY
HANFORD

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JUBILEE
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LONG STEM
MINNIE ROYAL
MONA
MOREAU
PRETTY BABY
PRETTY BOY
RAINIER
ROYAL ANNE
ROYAL LEE
ROYAL RAINIER
ROYAL SWEET

RUBY
RUBY BING
SCARLET
SOUTH
SUNBURST
SWANSON
SWEET HEART
TART
TIETON
TULARE
UTAH GIANT
VAN
VISTA

Bing



- Industry standard
 - 60-70% of California shipments
- Large, firm & durable
- Many clones
- Spurs, Doubles and Sutures
- Rain Cracking
- High chilling requirement

Variety dependant
Pistil formation in July
> 90°F



“Particle Film Technology”



Rain Cracking

Variety

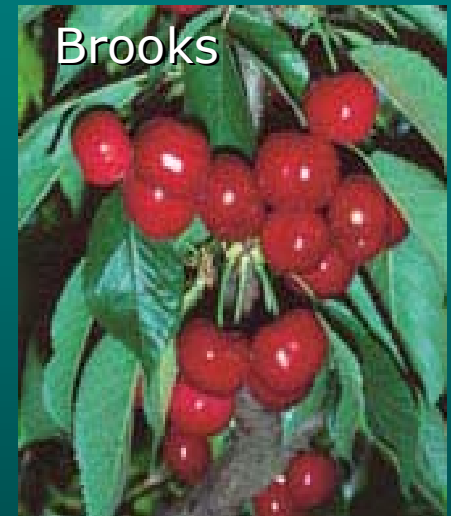
Maturity

Rain duration





“Standard” Varieties



Garnet

WSU Varieties



Tieton

Chelan

Index



Summerland, B.C. Varieties



- 6-10 Days after Bing
- Firmness can be an issue
- Good size
- Self-fertile: can overset
- Some crack resistance

Varieties gaining in popularity

Coral Champagne

- 9-10 days before Bing
- Very firm
- Good size if cropping is managed
- Crack resistance is between Bing and Chelan



Varieties gaining in popularity

Royal Rainier

- 5-7 days before Bing
- Very firm
- Productive
- Good size
- High color
- Very sweet flavor
- Rain cracking like Brooks



Varieties gaining in popularity

Sequoia™

- 4 Different Varieties
 - Glenred
 - Glenoia
 - Glenare
 - Glenrock
- Mainly planted in the southern valley
- Requires fruit to be sent to Warmerdam Packing in Hanford



New Selections and Experimental Varieties



Zaiger Genetics &
Dave Wilson Nursery,
Modesto, CA

Rosie Rainier

Pollenizer placement for cherries



- Evenly distributed
 - Every 3rd or 4th tree in every 3rd or 4th row
 - Multiple or single pollenizer variety
- In solid rows
 - Multiple or single varieties
 - Usually used for harvestable "pollenizers"

Sweet Cherry Roostocks

“Standard” stocks

- MAHALEB (*Prunus mahaleb*)
 - Mostly seedlings in US
 - Some clones (S.L. 64, UC)
- 👉 Less vigorous, less upright, and more precocious than Mazzard
- 👉 Tolerates drought & calcareous soils
- 👉 *Phytophthora* and gophers main problems limiting broader use



Low budded mahaleb



MAR 24 2003

High grafted mahaleb

Sweet Cherry Roostocks

“Standard” stocks

- MAZZARD (*P. avium*)

- Mostly seedlings in US
- Few clonal selections (F 12/1)



Large vigorous tree, slow to bear, not suitable to high density orchards







“Larger, firmer” but slightly later fruit



More resistant to *Phytophthora* and gophers than Mahaleb

Sweet Cherry Roostocks

“Standard” stocks

- COLT (*P. avium* x *P. pseudocerasus*)
 - Clonal selection from E. Malling
 -  Variable vigor & productivity, depending on site
 -  Sensitive to drought
 -  Resistant to cherry stem pitting
 -  Less *Phytophthora*, gopher problems than Mahaleb

Sweet Cherry Roostocks

“New” stocks

- Gisela[®] Series (Giessen, Germany)
 - Gisela 5, 6 and 12 available commercially
 - Gisela 6, 12 have potential in California
 - Gisela 5 too small
 - Care to maintain balance of production and growth

Sweet Cherry Roostocks

“New” stocks

■ Others

- Zee Stem[™] Interstem on Citation
 - 60-70% of Mazzard
 - Some varieties poorly compatible
 - Zaiger Genetics, Modesto
- Krymsk 5,7 (former USSR)
- MxM series (Oregon)
 - MxM 60
 - Maxma 14 (France) “50-70% of mazzard”
- Gembloux series (Belgium)
 - GM 9, 61/1, 79

4th leaf Bing

Gi 6

Mahaleb



7th leaf Bing on Gisela 6 and Mahaleb



4th leaf Bing on Zee Stem™



CHERRY "SYSTEMS"

Traditional "Open Vase"



MAR 22 2004



MAR 22 2004

“Steep leader”



MAR 22 2004



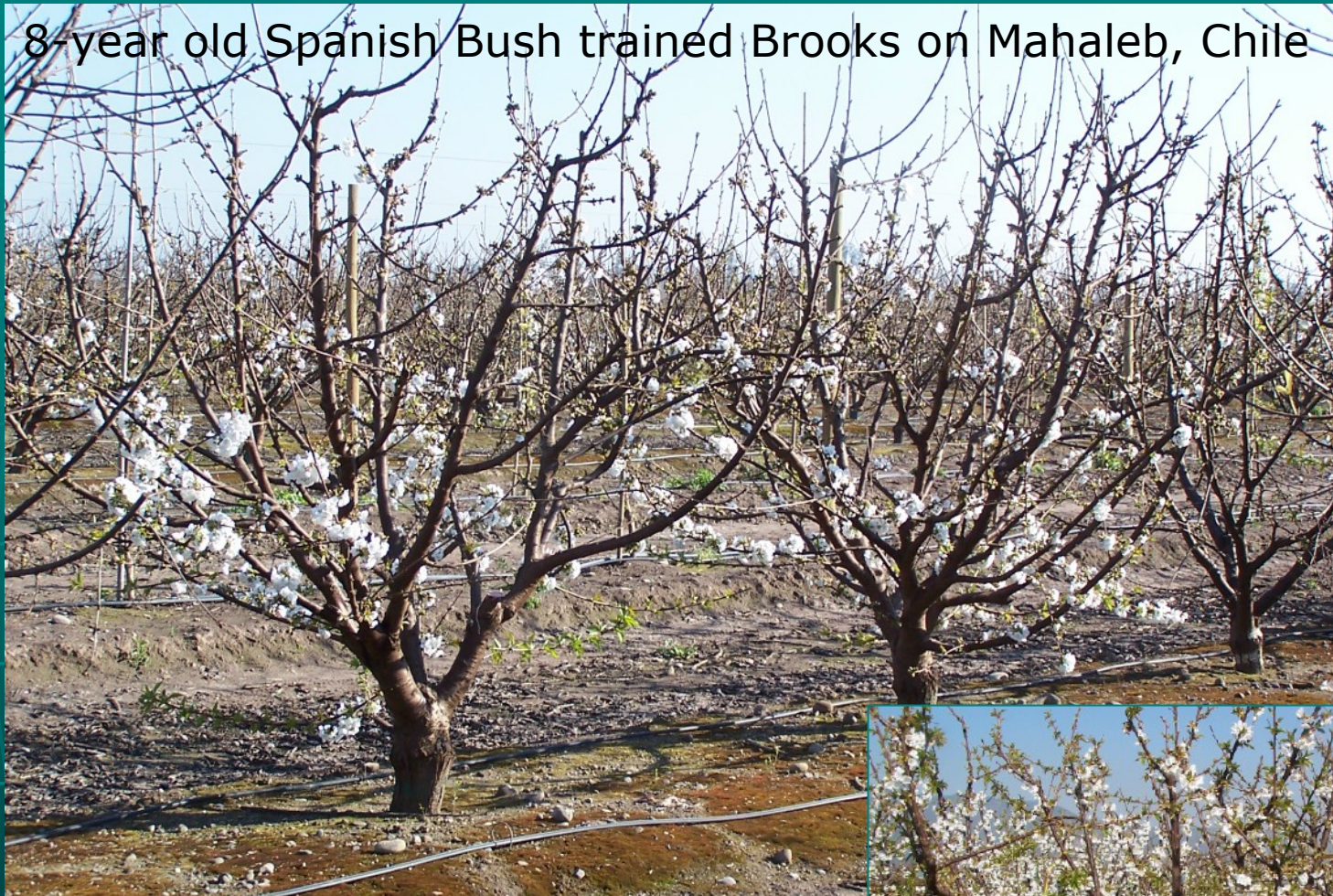


MAR 22 2004

10 year old Spanish Bush trained tree on Gisela 6



8-year old Spanish Bush trained Brooks on Mahaleb, Chile



Y Trellis

4th leaf Chelan
on Mazzard



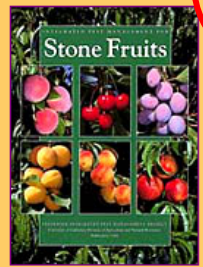


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How to Manage Pests Cherry

[More crops](#)

For more information, see this UC IPM book:



Integrated Pest Management for Stone Fruits

UC IPM Pest Management Guidelines—University of California's official guidelines for pest monitoring techniques, pesticides, and nonpesticide alternatives for managing pests in agriculture, floriculture, and commercial turf. [More](#)
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- [Major Monitoring Periods in an IPM Program](#) (4/06)
- [Relative Toxicities of Insecticides and Miticides Used in Cherries to Natural Enemies and Honey Bees](#) (4/06)
- [General Properties of Fungicides Used in Cherries](#) (4/06)
- [Most Effective Treatment Timings for Key Diseases](#) (2/08)

Diseases

- [Armillaria Root Rot \(Oak Root Fungus\)](#) (4/06)
- [Bacterial Canker](#) (4/06)
- [Brown Rot Blossom and Twig Blight](#) (4/06)
- [Cherry Buckskin](#) (4/06)
- [Crown Gall](#) (4/06)
- [Eutypa Dieback](#) (4/06)
- [Phytophthora Root and Crown Rot](#) (4/06)
- [Powdery Mildew](#) (4/06)
- [Ripe Fruit Rot](#) (4/06)

Nematodes

- [Nematodes](#) (4/06)

Insects and Mites

- [American Plum Borer](#) (4/06)
- [Black Cherry Aphid](#) (4/06)
- [Black Scale](#) (4/06)
- [Branch and Twig Borer](#) (4/06)
- [Brown Mite](#) (4/06)
- [Cherry Leafhopper](#) (4/06)
- [Cherry Slug](#) (4/06)
- [Cribrate Weevil](#) (4/06)
- [European Earwig](#) (4/06)
- [European Fruit Lecanium](#) (4/06)
- [Fruittree Leafroller](#) (4/06)
- [Green Fruitworms](#) (4/06)
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- [Orange Tortrix](#) (4/06)
- [Pacific Flatheaded Borer](#) (4/06)
- [Peachtree Borer](#) (9/06)
- [Peach Twig Borer](#) (4/06)
- [Redhumped Caterpillar](#) (4/06)
- [San Jose Scale](#) (4/06)
- [Shothole Borer](#) (4/06)
- [Webspinning Spider Mites](#) (4/06)
- [Western Tussock Moth](#) (4/06)

More information

- [2008 Efficacy and Timing of Fungicides, Bactericides, and Biologicals for Deciduous Tree Fruit, Nut, Strawberry, and Vine Crops](#) (932 KB, PDF)
- [Weed Photo Gallery](#)
- [Natural Enemies Gallery](#)

PDF: You need a PDF reader, such as Acrobat Reader version 8 or later, to view or print this PDF. If no reader is installed on your computer, you can [download](#) a free copy of Adobe Acrobat Reader.

- How to Manage Pests**
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 - Exotic & invasive
 - Weather data & products
 - Degree-days
 - Interactive tools & models
- Identification Galleries**
 - Natural enemies
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Cherry Year-Round IPM Program for Cherry

(Reviewed: 2/09, Updated 2/09)

These practices are recommended for a monitoring-based IPM program that reduces water and air quality problems related to pesticide use. Links take you to information on how to monitor, example forms to use, and management practices. Track your progress through the year with the annual checklist form.

Water quality becomes impaired when pesticides move off-site and into water. Air quality becomes impaired when volatile organic compounds move into the atmosphere. Each time a pesticide application is considered, review the [Pesticide Application Checklist](#) at the bottom of this page for information on how to minimize air and water quality problems.

This program covers the major pests of cherry. Information on additional pests is included in the [Cherry Pest Management Guideline](#). Example forms are available for record keeping.

[Print annual IPM checklist](#) (198 KB, PDF) | [Cherry Pest Management Guidelines](#) | [Example Forms and Photo ID pages](#) |

- [Dormant](#)
- [Preharvest through harvest](#)
- [Bloom](#)
- [Postharvest](#)
- [Fruit development](#)
- [Pesticide application checklist](#)

Dormant—leaf fall to bud swell (December–February)

 [Mitigate pesticide usage to minimize air and water contamination.](#)

What should you be doing at this time?

Look for:

- [San Jose scale](#) (mostly in southern San Joaquin Valley):
 - Prune samples from tree tops to determine if a dormant spray is needed.
 - Put out pheromone traps by the end of February to help time in-season sprays.
- [Black cherry aphid](#) eggs

[Survey weeds](#) and check for weeds that escaped fall herbicide treatments.

- [Record results](#) (62 KB, PDF).
- Adjust herbicides and/or timing accordingly for future treatments.

Apply a dormant spray according to the PMG if the orchard has a history of these problems, or if monitoring indicates a need:

- [San Jose scale](#)
- [Black cherry aphid](#)
- [European fruit lecanium](#)
- [Cherry leafhopper](#) (if X-disease/cherry buckskin is a problem)
- [Powdery mildew](#)

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UC IPM Pest Management Guidelines: CHERRY

September 2006

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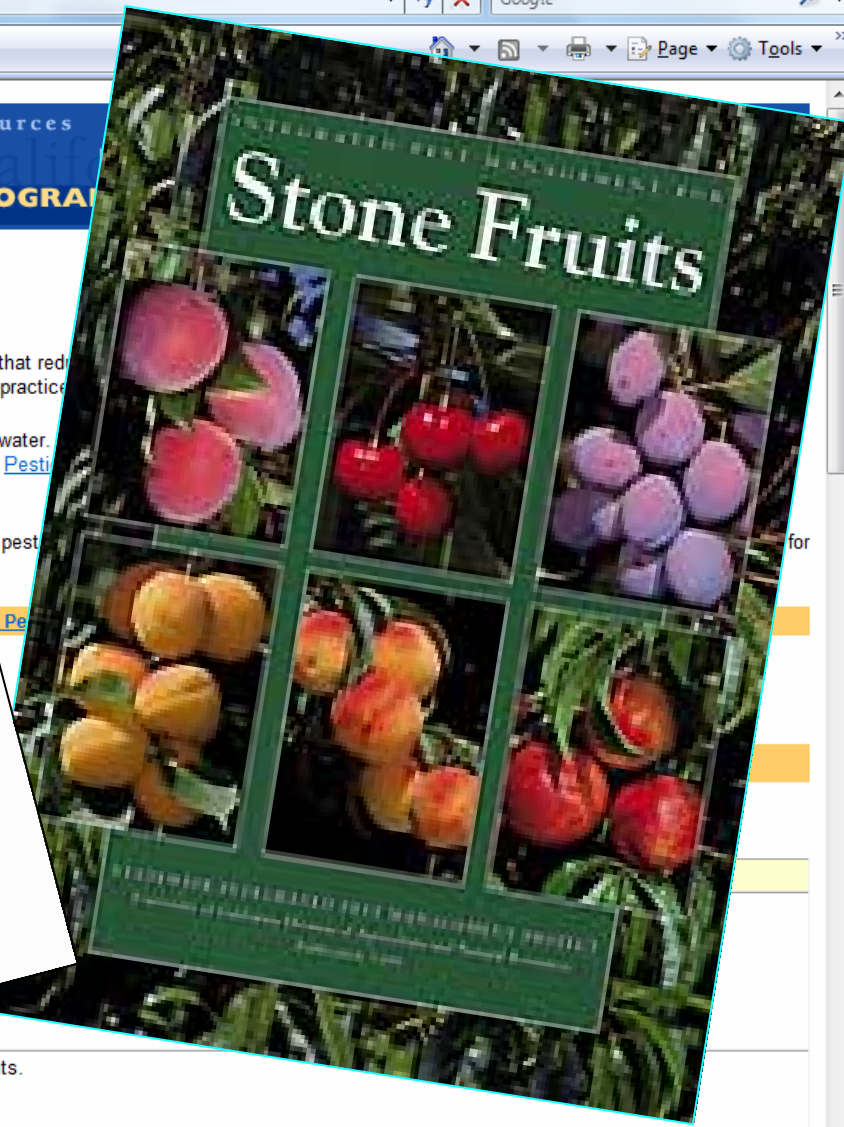
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Ripe Fruit Rot (04/06)	
Nematodes (04/06) (section reviewed 04/06)	
Precautions for Using Pesticides	

An illustrated version of this guideline is available online at <http://www.ipm.ucdavis.edu/PMG/selectnewpest.cherries.html>



Publication 3440
University of California Agriculture and Natural Resources
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... that escaped fall herbicide treatments.

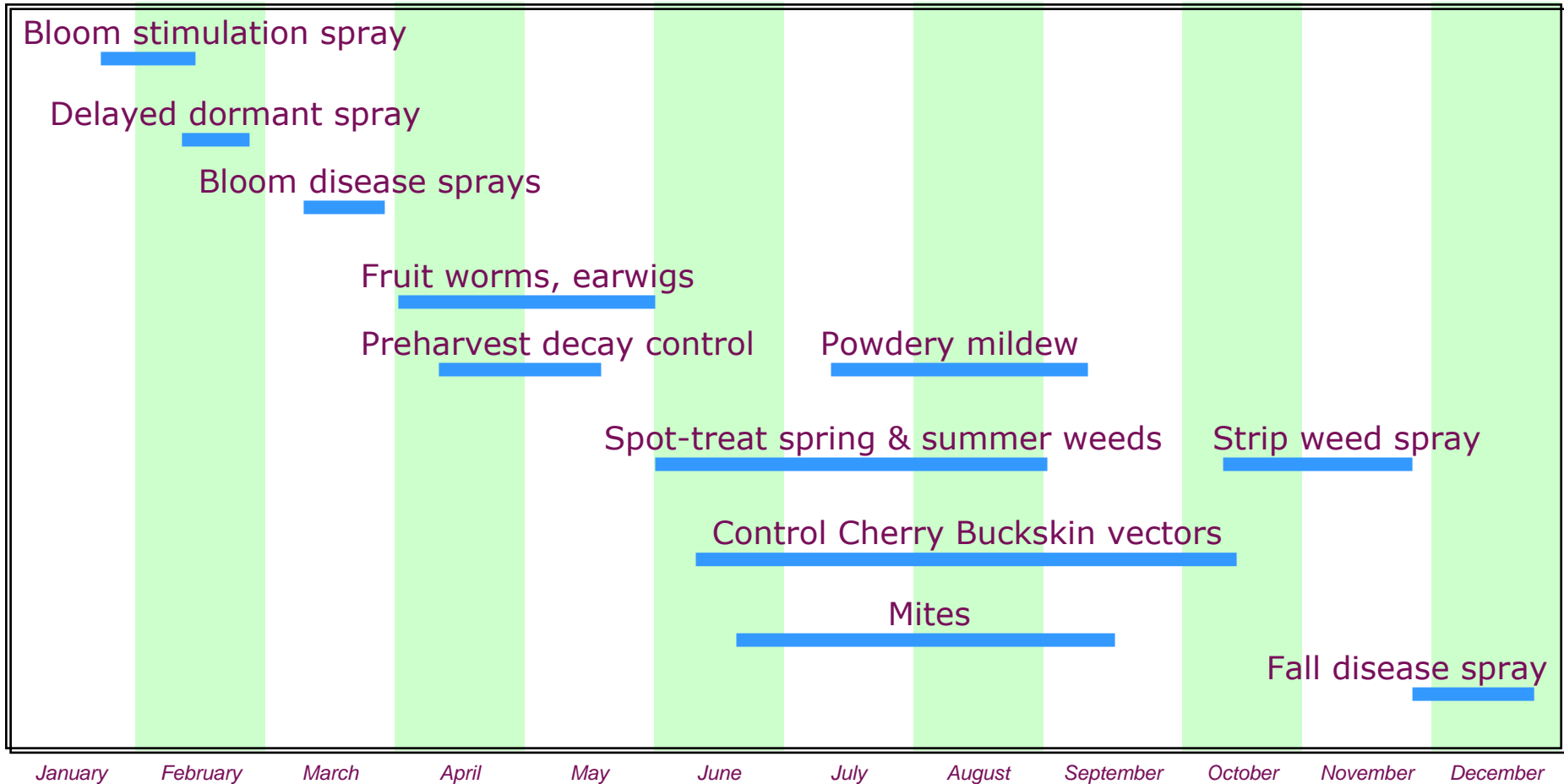
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- [Powdery mildew](#)

CHERRY PEST MANAGEMENT CALENDAR OF OPERATIONS

Joe Grant, UC Farm Advisor, San Joaquin County



This calendar lists typical timings of practices conducted in a sweet cherry orchard. Specific needs will determine if the practice is necessary.

Blossom & fruit rots

Brown rot blossom blight and fruit rot

Botrytis blossom blight

Rhizopus fruit rot



Powdery Mildew

Podosphaera clandestina





Green Fruitworms



Obliquebanded Leafroller



Fruittree Leafroller

Web-spinning mites



Other Pests



Black Cherry Aphid



UC Statewide IPM Project
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San Jose Scale and others



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Birds



Wood borers



Earwigs



Cherry Slug



Pocket gophers

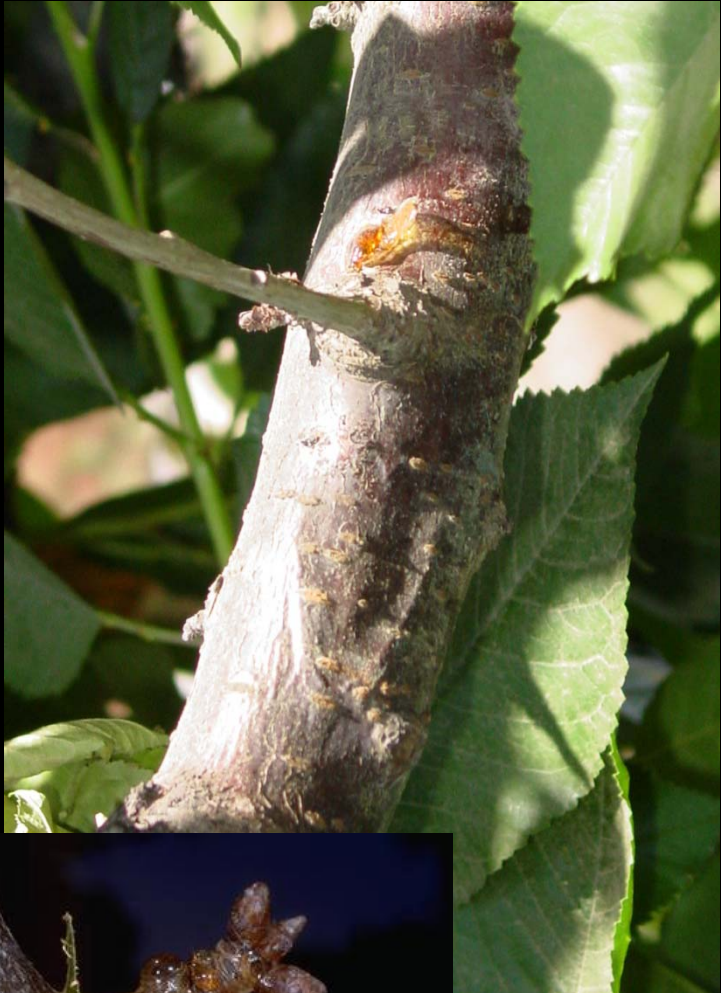


MAHALEB >> Mazzard = Colt

Phytophthora root & crown rot



Bacterial canker & blossom blast



Cherry X-Disease (Buckskin)
High-worked Mahaleb tree





X-Disease Vectors

Phloem feeders
June - October



Cherry Stem Pitting Disease





VIRUSES

Buy certified stock



Cherry crinkle

MAY 5 2004

Thank you

jagrant@ucdavis.edu