



Pollination Economics

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NATIONAL RESEARCH COUNCIL
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- Economics is about satisfying human needs and wants with limited resources.
- Flowering plants that rely upon animal pollinators give us:
 - Food
 - Genetic diversity
 - Beauty



Pollination economics divides between commercial and natural

Pollinators

		Commercial	Natural
Plants	Commercial	Agriculture & rented bees	Agriculture & wild pollinators
	Natural	Wild plants & rented bees	Wild plants & wild pollinators

Many foods rely on pollinators



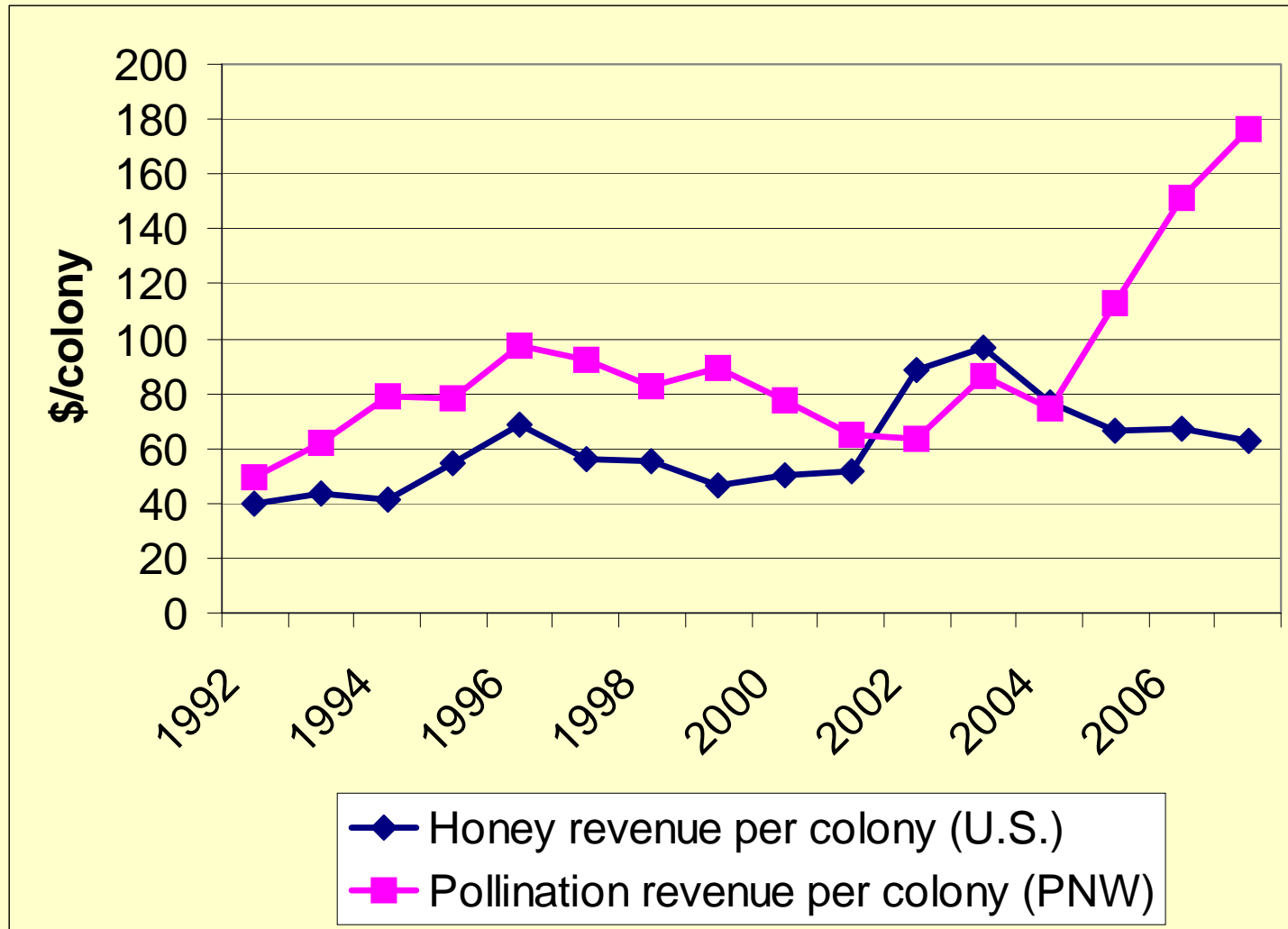
- Apple
- Blueberry
- Cherry
- Cucumber
- Melon
- Nuts (almond)
- Peach
- Pear
- Squash
- Seed of alfalfa, hybrid canola

European honeybee: Star agricultural pollinator for 3 reasons

- Lives in colonies of 15,000 – 30,000
- Transported easily
- Honey is a joint product

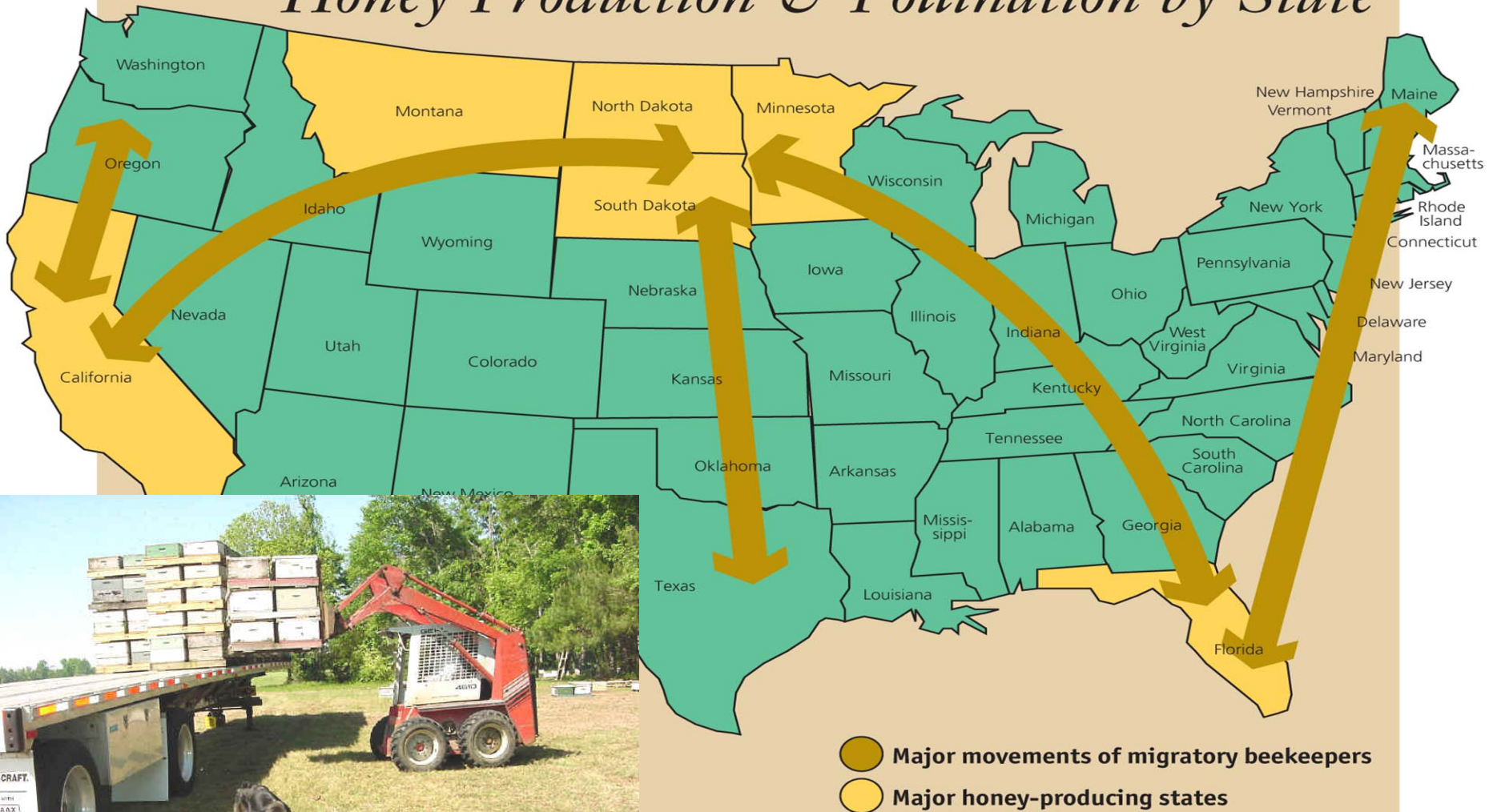


Beekeeper revenue from pollination surpassed honey in 2005



Source: Stan Daberkow & Mike Burgett, pers. comm. 2008

Honey Production & Pollination by State

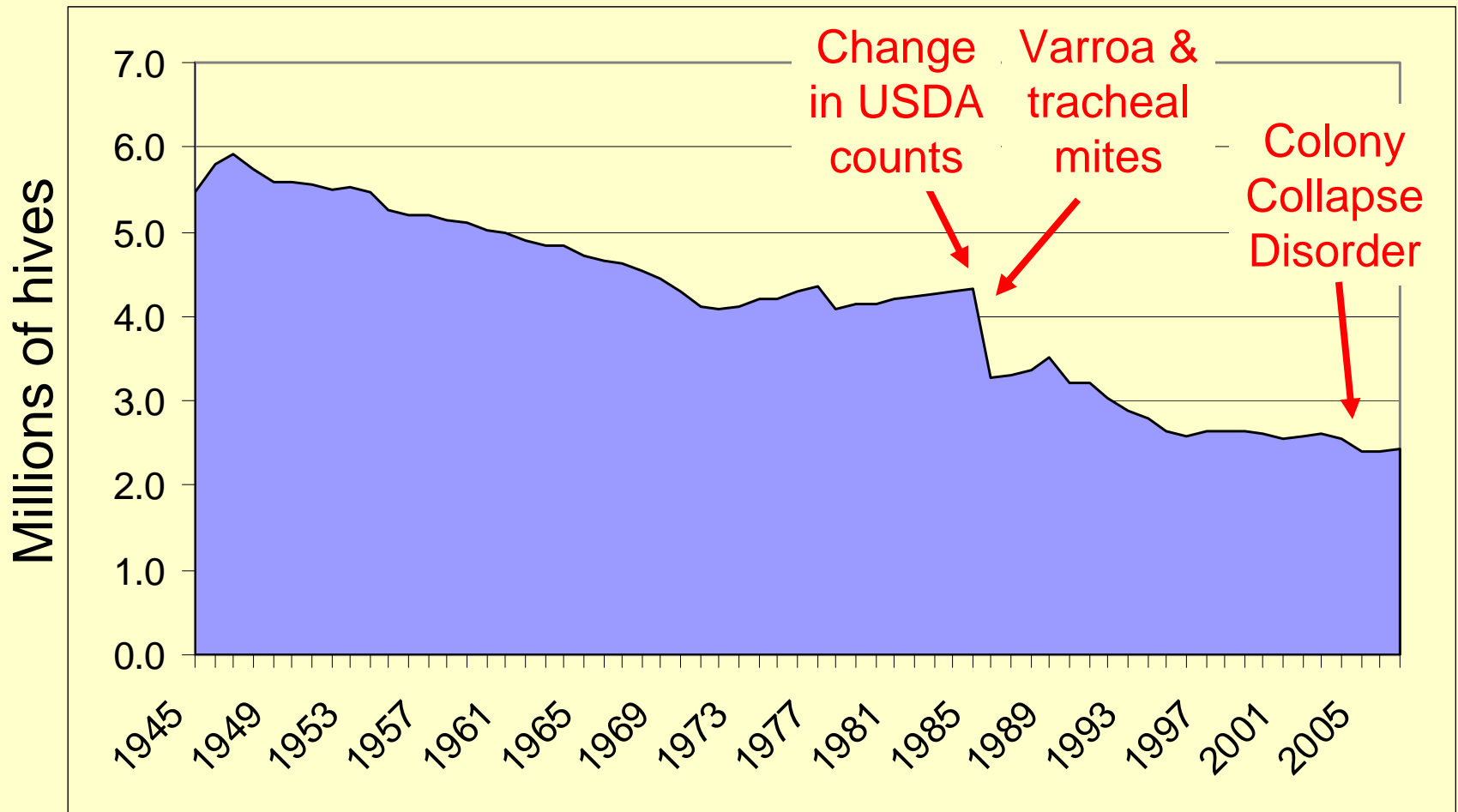


Source: National Honey Board

Major Crops that Depend on Honey Bees for Pollination

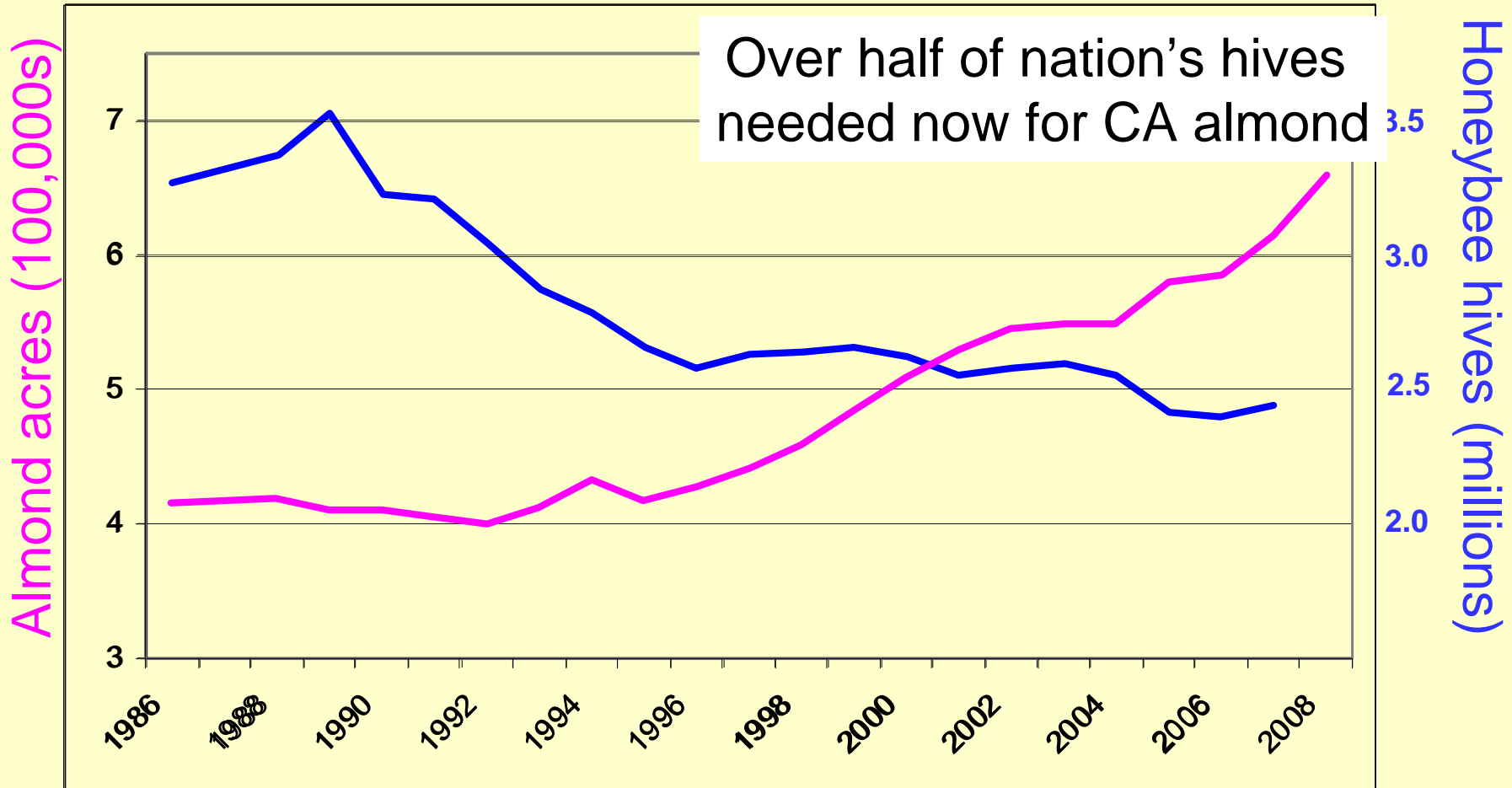
alfalfa seed, almond, apple, avocado, blueberry, cantaloupe, cherry, cranberry, cucumber, honeydew, kiwi fruit, pear, plum, sunflower, vegetable seed, watermelon

US honeybees have declined due to disease, mites and fewer beekeepers

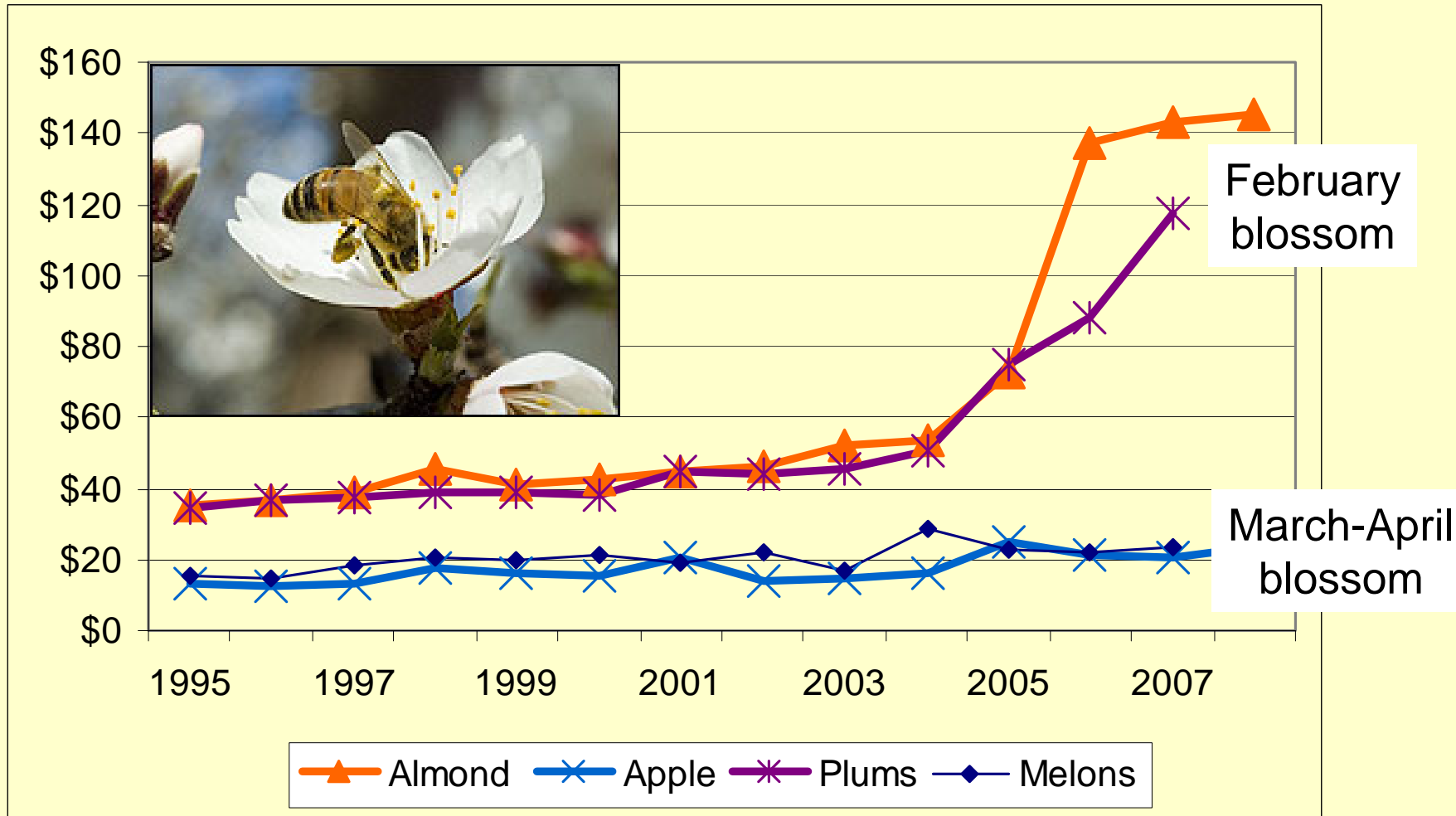


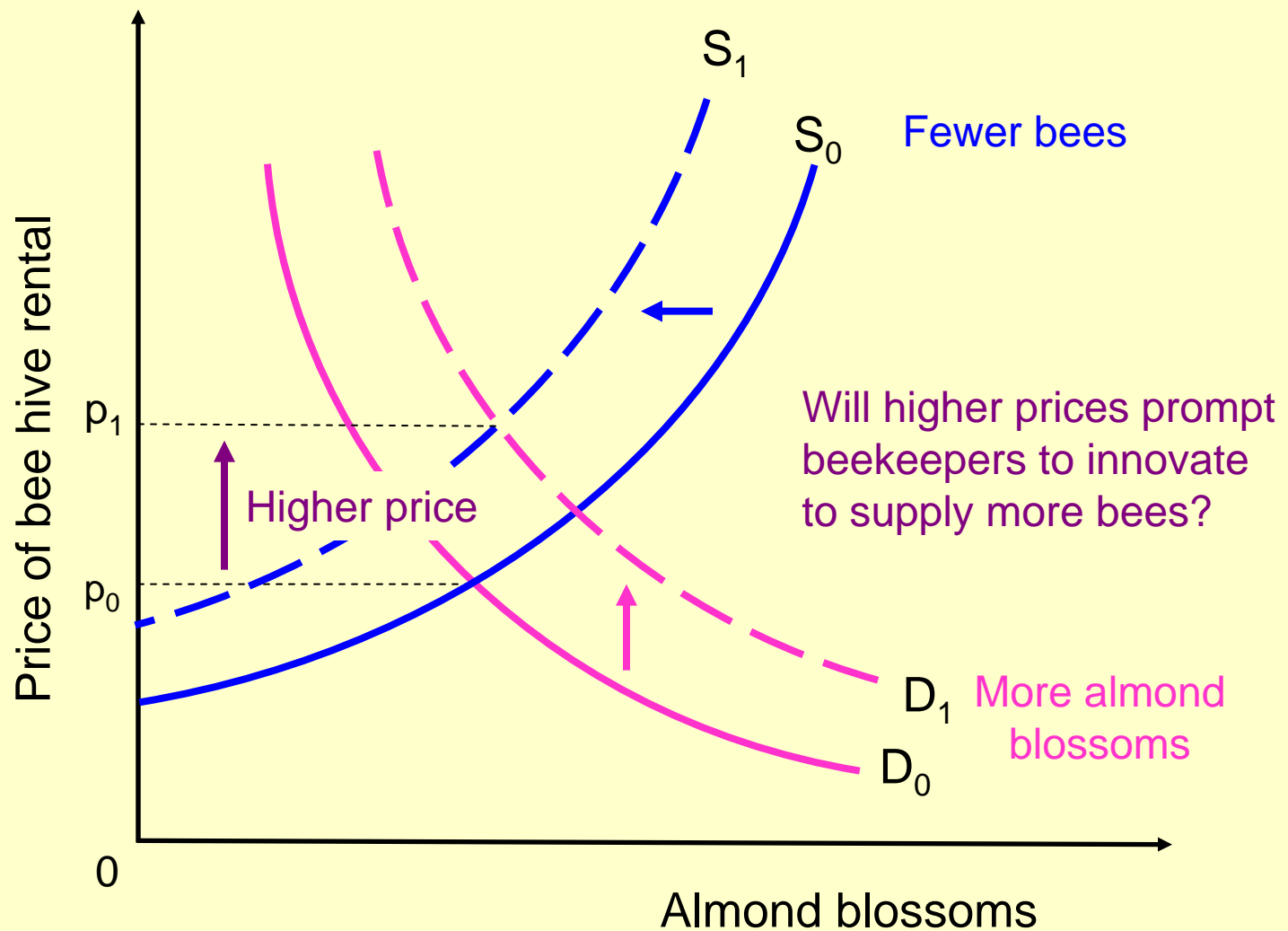
Fewer honeybees

for more almond acres → shortage



Pollination fees in California soar during almond blossom





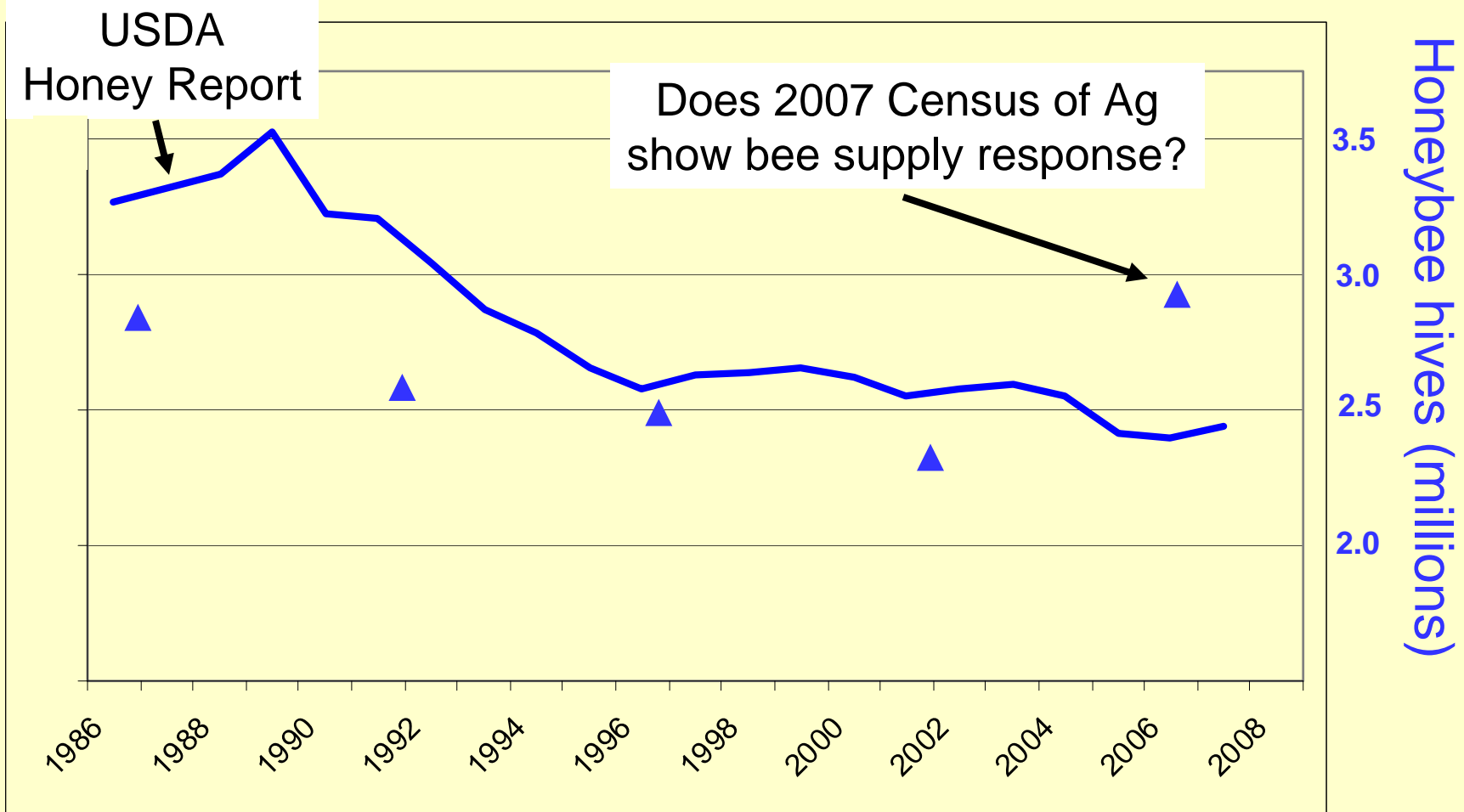
Adapted from: Fig. 4-1, NRC, *Status of Pollinators in North America*, 2006

Responses to shortage of commercial honeybees

- Imports of “package” honeybees
- Beekeepers invest more to keep bees healthy and to divide hives
- Research directions
 - Honeybee health
 - Other managed bees
 - Self-pollinating crops
 - Natural pollinators



Fewer hives for honey, but are pollination hives ticking up?



▲ Census of Agriculture, 1987 – 2007 (all colonies, not just for honey)

Native pollinators play economic roles too

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Native pollinator services

- In wild plants
 - Evolve genetic diversity
 - Enable reproduction of existing plant species
- In agriculture
 - Contribute to crop yield
 - Insure against shortages of commercial bees
- But economically, they ...
 - Lack markets for products
 - Lack owners to protect them
 - Need valuation research



Take-away messages

- Pollination markets can respond to shortage of commercial pollinators
 - But good info needed on bee inventories & markets
 - For supply response, need research on
 - Bee health
 - Crop response to pollination levels
- Wild pollinators need research
 - Contribution to agriculture
 - Natural evolution & its value
 - Risk of habitat loss
 - Incentives to preserve & manage

