13.2 Cost of Biological Control of Invasive Arthropods

K.M. Jetter

University of California Agricultural Issues Center, Davis, California, USA,
jetter@primal.ucdavis.edu

California is the largest producer of perennial tree and vine crops in the U.S. In 2015 over 12.4 million utilized tons were produced on 2.5 million acres for a total value of over $16 billion (USDA-NASS, 2017). California agriculture has also seen the establishment of invasive arthropods that affect the costs to produce fruit. These pests can be treated with conventional or biological pest controls.

Between 2000 and 2015 acreage treated in both conventional and biopesticides for arthropods increased. However, while there was an increase in conventional insecticides, total acreage treated in biopesticides in 2000 was greater than the total acreage in 2015 (Figs. 13.2.1 and 13.2.2) (CDPR, 2017). Increased treatments are a result of increased acreage in production, and the entry and establishment of invasive arthropods during this time period such as the glassy-winged sharpshooter, *Homalodisca vitripennis* (Germar) (Hemiptera: Cicadellidae), European grapevine moth, *Lobesia botrana* (Denis & Schiffermüller) (Lepidoptera: Tortricidae), and olive fruit fly, *Bactrocera oleae* (Rossi) (Diptera: Tephritidae).

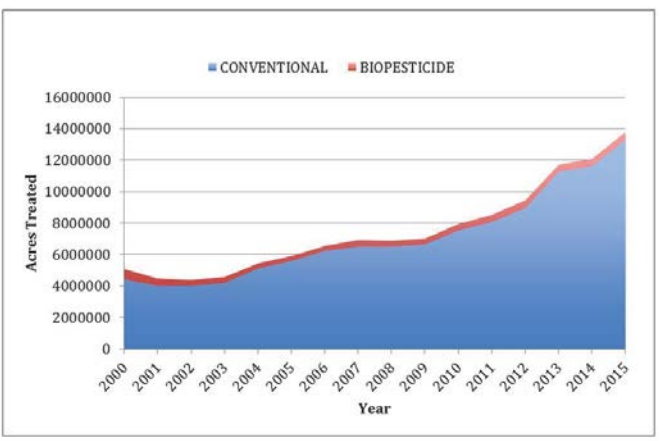

Fig. 13.2.1 Acreage treated in conventional and biopesticides.

©CAB International 2017. *Proceedings of the 5th International Symposium on Biological Control of Arthropods* (eds. P.G. Mason, D.R. Gillespie and C. Vincent)

While overall acreage treated in biopesticides was lower in 2015 than in 2000, the mix of biopesticides has changed and there has been an increase in the use of phermones and "other". Other biopesticides include insect growth regulators such as azadirachtin, and microbial insecticides such as Grandevo.

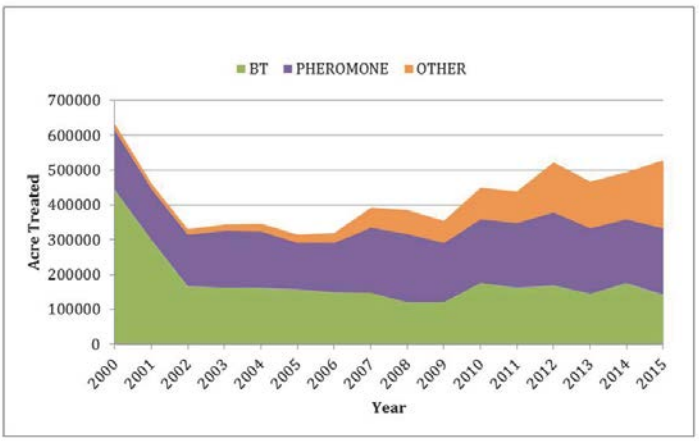

Fig. 13.2.2. Acreage treated in biopesticides by category.

In recent years acreage increasing in biopesticides has been increasing more rapidly than acreage in conventional pesticides, also causing costs to increase. For example, between the years 2011 and 2012 acreage treated with conventional insecticides increased by 9.0% while costs increased by 10%. During that same period acreage in biopesticides increased by 36% while costs increased by 39% (Table 13.2.1). However, the increase between 2012 and 2013 was even greater. Acreage in conventional insecticides increased by 26% while costs increased by 17%. Acreage in biopesticides increased by 155% while costs only went up by 135%.

Table 13.2.1. Acreage treated and cost of treatment for conventional and biopesticides.

	Acreage		Costs (US $)	
	Conventional	Biopesticides	Conventional	Biopesticides
2011	4,134,371	2,729	354,282,036	166,207
2012	4,579,277	3,808	386,195,689	226,368
2013	5,397,497	8,979	488,531,205	487,647

In addition to biopesticides, classical biological control programs have also been completed and agents released into the environment. These agents can cause significant cost savings depending on crop and pest type.

References

USDA (2017) National Agricultural Statistics Service survey data. Available at: https://quickstats.nass.usda.gov/ (accessed 31 May 2017).

California Department of Pesticide Regulation (2017) Pesticide Use Annual Summary Report data. Available at: ftp://transfer.cdpr.ca.gov/pub/outgoing/pur_archives/ (accessed May 2017).