Organic Strawberry Transitions in a Changing Regulatory Climate for Soil Fumigants

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Abstract

In recent years, California's strawberry industry has seen enhanced restrictions on the use of soil fumigants, used to control weeds, nematodes and pathogens. These restrictions pose great challenges to the strawberry industry as it is currently structured. The goal of this research was thus to learn what strawberry growers were doing in this context for fumigant and to reveal some of the obstacles to non-chemical transitions, especially those that might be addressed through policy mechanisms. I found that growers were taking one or both of two paths: 1) increasing the use of chloropicrin and other still available chemicals in relation to methyl bromide; and 2) experimenting with or transitioning to organics. However, those experimenting with organics were primarily doing so for market reasons, rather than in response to regulations. Land issues have played a huge role in these transitions to organics, as growers are often guided by the availability of land suitable for organic production. These newly transitioned growers employ a range of practices to address soil pathogens, yet because of land costs and tight land markets, very few are able to significantly reduce their rotations of strawberries. Therefore, it is not clear that these transitions will be sustainable without policy interventions that address land markets.

Introduction and objectives

In recent years, California's strawberry industry has seen enhanced restrictions on the use of soil fumigants, used to control weeds, nematodes and pathogens. Methyl bromide is finally seeing phase-out under the Montreal Protocol on Ozone-Depleting Substances; methyl iodide was withdrawn from the market after meeting fierce public resistance for its high toxicity; chloropicrin was designated a toxic air contaminant and now must be used with augmented mitigation measures in California, 1,3-dichloropropene (Telone) is already mitigated by township caps, with further restrictions on the way, for its carcinogenic qualities. Presently, no "drop in replacements" are available. Moreover, in 2013, California's Department of Pesticide Regulation (DPR) published a "non-fumigant production plan," arguing for the need to curtail and eventually phase out fumigants altogether in order to protect the health of farmworkers, bystanders and nearby communities.

These restrictions pose great challenges to the strawberry industry as it is currently structured. Fumigants allow growers to plant on the same blocks year after year, or rotate with vegetable growers who also get the benefits of fumigation, and strawberry land values are based on the expectation of yearly plantings. The goal of this research was thus to learn what strawberry growers were doing in this changing regulatory context for fumigant use and to reveal some of the obstacles to non-chemical transitions, especially those that might be addressed through policy mechanisms.

Methods

Methods included tracking fumigant use through California's pesticide surveillance program from 2004 to 2013 (the last year for which data were available); semi-structured qualitative interviews with 74 strawberry growers in four California counties (Monterey, Santa Barbara, Santa Cruz, Ventura); and over fifty interviews with other interested parties, including industry representatives, research and extension

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agents, and independent pest control advisors. Of the growers interviewed, 36 were conventional, 31 were mixed or transitioning to organic, 6 were solely organic growers and, 1was unknown.

Results and discussion

Broadly, I found that growers were taking one or both of two paths: 1) increasing the use of chloropicrin and other still available chemicals in relation to methyl bromide; and 2) experimenting with or transitioning to organics. Figure 1 shows the number of pounds applied of the key fumigants to strawberry fields in nine key counties (including where nurseries are located), from 2004 to 2013, demonstrating an increase in chloropicrin use and decrease in methyl bromide use. Figure 2 shows the increase in statewide organic strawberry acreage from 2005 to 2012. For this paper, I focused on the latter path, discussing transitions to organics in the context of these regulatory changes.

However, I found that not all of these growers were moving to organics because of these regulatory changes. Of the 29 responses of the 34 growers we interviewed that were mixed, transitioning or recently-transitioned growers, 21 said that market considerations were primary in driving their transitions. By this, they meant that organic strawberries are more profitable because of higher prices or that consumers and intermediaries were asking for more organic berries. Regarding the former point, sample costs for organic production are fairly comparable on a per acre basis to conventional but revenues are strikingly higher – so that profits can differ by over $12,000 per acre (Bolda et al 2010; Bolda et al 2014). Four stated that their primary reason for transitioning was because of existing or future restrictions on fumigants, and another four expressed concern with their own safety or those with whom they work. Several growers provided multiple reasons. These reasons for transitions to organics are nearly identical to those I found in my earlier study of organics (Guthman 2004).

Land issues have played a huge role in these transitions to organics, as growers are often guided by the availability of land suitable for organic production. Many seek land that is immediately certifiable and pathogen free. In that vein, about a third of those interviews began organic production on land had not been in crop production. This was a particularly popular option in relatively rural Santa Maria where the foothills contain land that was recently pasture. Another third began on already certified organic land (after testing it for pathogens). For some of these growers, the availability of certified land was the reasons they entered into organic production in the first place. Only about a third are going through the process of transitioning land over a three-year period. Several stated that they see the three-year transition requirement as a big obstacle. Interestingly, I learned of growers experimenting with organic production in the buffer zones for fumigant applications.

Newly transitioned growers are trying a range of practices to control soil pathogens on their organic fields. These include: rotating with vegetable growers who plant brassicas, planting brassicas or mustard as bio-fumigants, cover cropping and composting, anaerobic soil disinfestation (primarily on small blocks), and doing very little and hoping for the best. Those with more experience and success in organic strawberry production tend to plant strawberries on any given block less frequently (3-5 years) than less experienced growers. Indeed, for some successful growers, strawberries are a minor crop. Time will tell whether frequent plantings will (re)introduce soil pathogens.

Conclusions

Should fumigant restrictions continue to tighten, and politically acceptable “drop-in replacements” fail to appear, growing strawberries will become increasingly challenging for California strawberry growers. That more growers are turning to organics is laudable, even if for market reasons. Yet, transitioning to organics may not be efficacious without fully incorporating a range of practices in which strawberries are rotated every 4-5 years. Such integrated practices require a great deal of land that is relatively pathogen free. With already existing land shortages (and ever increasing land values), “going organic” is not a

straightforward solution for California's highly entrenched strawberry industry. Therefore, to encourage more sustainable transitions to organics or even farming without fumigants, policy makers will need to address land market issues.

Acknowledgements

I wish to thank Madison Barbour, Sandy Brown, Yajaira Chavez, and Savannah Coker for invaluable research assistance. The project was supported by a research grant from the National Science Foundation, Grant #1262064

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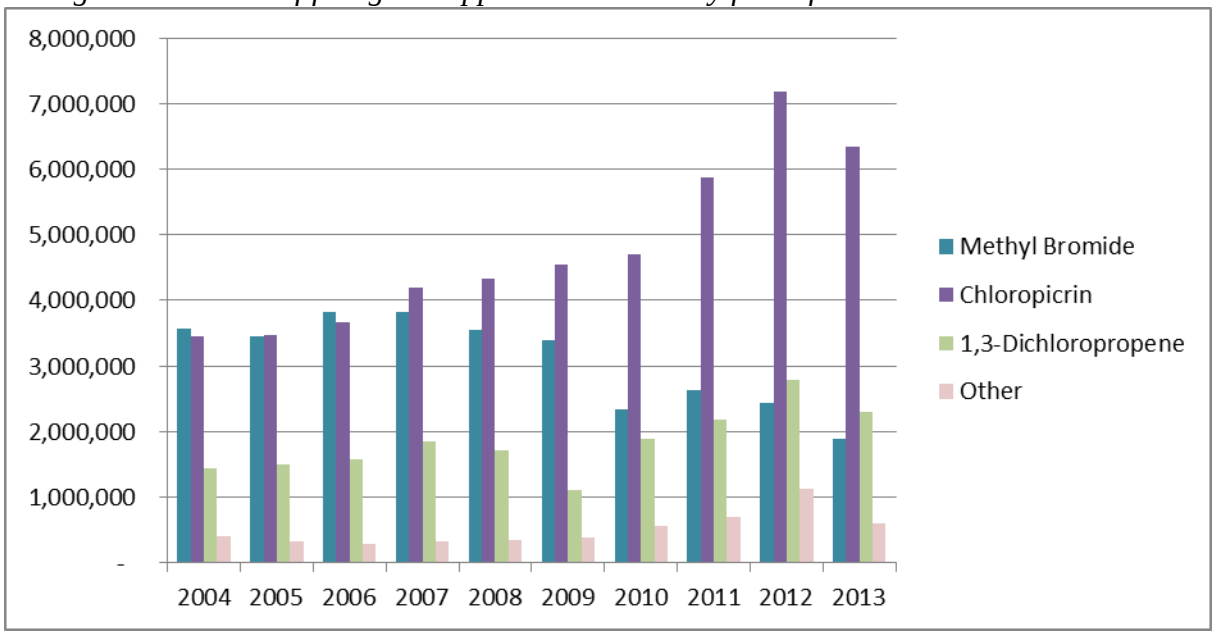
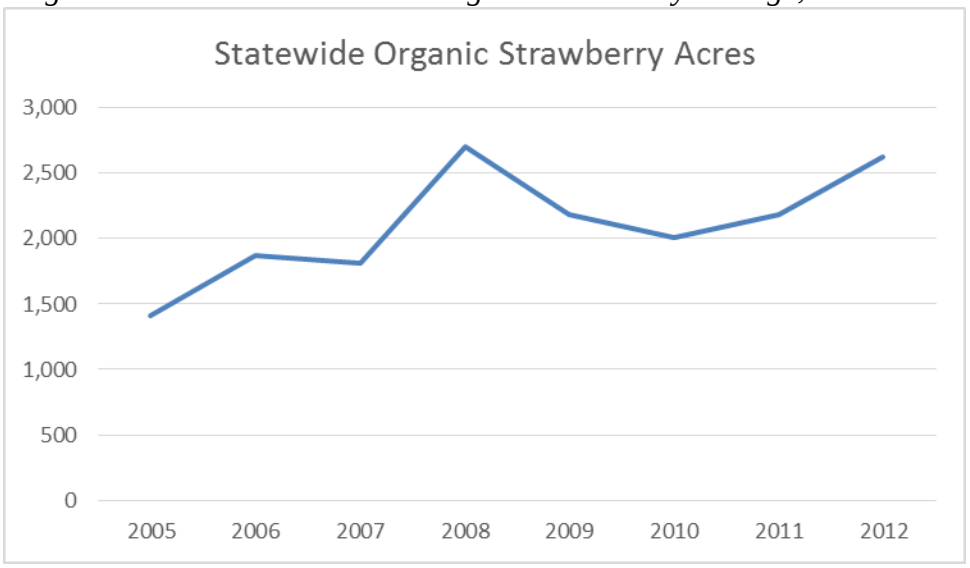
Appendix

Figure 1: Pounds of fumigants applied to strawberry fields for nine counties 2004-2013



Source: California Pesticide Use Reporting System

Figure 2: Increases in statewide organic strawberry acreage, 2005-2012



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