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Review: Wilted: Pathogens, Chemicals, and the Fragile Future of the Strawberry Industry

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Guthman, Julie. *Wilted: Pathogens, Chemicals, and the Fragile Future of the Strawberry Industry.* Oakland, CA, USA: University of California Press, 2019, 328 pp. ISBN 978-0-520-30528-1, paperback. US$29.95.

Strawberries are big business in California, which produces 88 percent of strawberries in the United States. Julie Guthman´s well researched book, *Wilted: Pathogens, Chemicals, and the Fragile Future of the Strawberry Industry,* which is based on the interviews of 75 growers, 50 workers, and dozens of industry representatives, presents a dark side of the production of the nation's favorite berry with backbreaking labor conditions and dependence on highly toxic soil fumigants.

Guthman is convincing in showing that history matters. The conditions that now jeopardize the future of the industry can be traced back to the 1920s, when early strawberry growers first encountered wilted plants. Instead of abandoning the fields and their investments, they turned to the University of California, seeking repair to the situation. UC complied, first by identifying the problem and giving advice, then with establishing a plant breeding program, and finally with fumigation, a method of pest control that completely fills an area with gaseous pesticides. Fumigation allowed annual planting of strawberries on the same blocks of land, and rents and mortgages adjusted to yearly planting. Land values increased further as plant breeders were able to relinquish concerns with pathogen resistance and turn their attention to productivity and durability. This again allowed the shipment of strawberries to distant markets. The high costs of these up-front investments in plants, fumigation, and other ground preparation, made cheap and reliable labor an imperative for growers. New pathogens emerged as the fumigation unleashed new ecological conditions or aggravated old ones. Intensified mono-cropped strawberry production finally reached its tipping point, as years of drought and hotter-than-normal temperatures made the plants more vulnerable to opportunistic fungi. Simultaneously, plant traits possibly useful to contend with changing climatic conditions might have been lost in the breeding process.

Thus those in the business of repair were trying to fix something that was changing because of what they thought that they had fixed. This makes pesticide reduction more than a political-economic problem of growers being squeezed or an ecological problem of pathogen resistance to fumigation. It makes it a knowledge problem, too. The solution of fumigation was developed in institutions geared towards supporting farmers with their production problems. Narrowly disciplined and not integrated, the knowledge produced in these institutions was generally productive and instrumental, with research directed at knowing pathogens, plants, and chemicals, and then isolating solutions to specific problems. Scientists paid little attention to how pathogenicity arose in the first place or how pathogenic fungi coevolved with the berry.

Regardless of an exception to the rule, the Californian strawberry industry might have developed beyond repair. Nevertheless it can give a valuable lesson to the agricultural industry in general:

> What this story tells us is that we should worry about chemical-intensive agriculture… …not only for its toxicity to humans and others, and not even only for its capacity to unleash novel pathogens and other undesirable and often indeterminable environmental changes. We should worry about it because it gives rise to entire assemblages that are so entrenched that when toxicity becomes an issue or conditions of production are compromised, there is little room for maneuver (p. 203).

This book is no easy read, but the issue is also very complex. Nevertheless, everyone in the strawberry industry or food production in general should read this book. I would also recommend it to anyone eating strawberries, although it can give a sour taste to your strawberry daiquiri. Perhaps an organic one the next time.

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