



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Consumers Choose Lower Pesticide Use Over Picture-Perfect Produce

Lori Lynch
(202) 219-0689

When offered a choice between picture-perfect produce and blemished produce, California consumers preferred the picture perfect. Yet when told that the scarred produce had been grown with half the pesticide sprays, these consumers overwhelmingly chose the scarred oranges.

How important is a product's appearance? It depends on who is asked. The produce industry believes consumers insist upon blemish-free fruits and vegetables. Consumer advocates and environmentalists maintain that people are willing to trade some degree of physical perfection for the lower use of pesticides.

The produce industry often uses chemicals to protect a product's appearance. As a tomato wholesaler declared, "the important thing for us, in a tomato, is to get it to the consumer looking good. No blemishes, no black spots, no softness." John McClung, spokesman for the United Fresh Fruit and Vegetable Association, acknowledges that chemicals are used to "some degree" for cosmetic purposes.

The link between high standards and chemical use is not a new idea. In 1978, Robert Van den Bosch, an Environmental Protection Agency researcher, reported that a significant percentage of pesticide use is for reducing blemishes or the number of insect parts on fruit and

vegetables and not for improving nutrition and wholesomeness.

In 1979, the Office of Technology Assessment (OTA) reported similar findings that 25 to 50 percent of pesticide use in apple production was to maintain appearance. In 1989, the National Academy of Science's Board of Agriculture reinforced the findings, stating that most fruit and vegetable marketing standards were for cosmetic purposes that rarely affected safety or nutritional value.

Yet the high appearance standards have not guaranteed customer satisfaction. For example, consumers express dissatisfaction with the taste and ripeness of market tomatoes. And responding to a University of California-Davis survey about food purchasing decisions, consum-

ers said their most important concerns were food safety, nutrition, and flavor.

Why does industry place such a heavy emphasis on how products look? Because people choose produce by appearance and price. Consumers look for "purchase clues" before deciding what to buy. In most stores, the only clues are appearance and price. Retailers don't offer taste samples, so consumers don't know the flavor of the available fruits and vegetables. To determine if a product is ripe, a person must squeeze it to feel the softness or firmness. However, even a squeeze is not a perfect clue. Consumers do not have exact information about a particular product's nutritional value. If they see blemishes or insect holes, they



Consumers are more willing to accept cosmetic imperfection on fresh produce if they could be assured that it was grown with reduced pesticides.

The author is an agricultural economist with the U.S. Agricultural Policy Branch, Agriculture and Trade Analysis Division.

may wonder about the product's wholesomeness.

Most consumers do not know the agricultural practices used to grow a product and get it to a market in good condition. The kind and quantity of chemicals used and residue levels are not identifiable at the time of purchase. Therefore, it is not surprising that the message to retailers, wholesalers, and farmers is that appearance and low price, the two clues that can be determined at the store, are the primary characteristics that customers seek.

Consumers' concerns about pesticides for environmental and food safety reasons are on the rise. In 1965, Robert Bealer and Fern Willets surveyed over a thousand Pennsylvania households, finding 52 percent were bothered by pesticide use. In another survey, 19 years later, Carolyn Sachs, Dorothy Blair, and Carolyn Richter, of Pennsylvania State University, found the concern level had climbed to 81 percent. Consumers' concern for farmers' safety in applying pesticides increased dramatically from 15 to 79 percent. In 1989, a Food Marketing Institute survey showed that 82 percent of consumers perceived pesticide residues as a serious hazard, with an additional 13 percent, something of a hazard.

People are changing their behavior in response to pesticide and health concerns. Fewer consumers are using chemical sprays in their own home gardens. The Food and Drug Administration and the National Institutes of Health interviewed 4,000 individuals in 1986 and found that 62 percent had made major changes in their diets to reduce the risk of heart disease and cancer.

In 1988, the University of Florida and USDA's Economic Research Service surveyed consumers in four different locations across the country. Over half of the

respondents said they were eating less of some foods because of safety concerns. Yet, *The Packer*, a trade publication for the fresh fruit and vegetable industry, found that while 86 percent of consumers expressed concern about chemical residues, only 26 percent responded that they had altered their fresh produce buying habits.

Changing purchasing habits may require consumers to make tradeoffs. One possible trade-off involving fresh produce is sacrificing some cosmetic perfection for lower pesticide use. *The Packer*, in another study, found that "looks appealing" was an important characteristic in selecting fresh produce. However, "taste/flavor" and "freshness/ripeness" were even more important. Thus, are consumers willing to trade picture perfection for lower pesticide use if taste and freshness are not affected?

To answer this question, the California Public Interest Group and researchers at the University of California-Davis chose to investigate consumer willingness to purchase oranges scarred by citrus thrips, a very small insect.

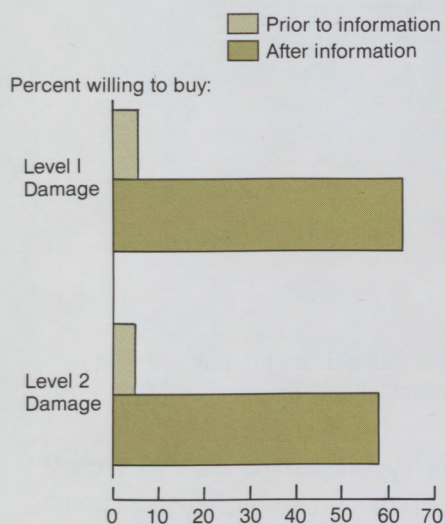
Thrips do not affect taste, nutrition, or storability of oranges, nor yield and health of the grove. Nor do the insects reduce future yields of mature trees. But thrips' scars do affect oranges' marketability and farmers apply many pesticide sprays to prevent such scarring. In fact, researchers Jong-Ying Lee and Max Langham found that farmers were applying more sprays than needed to maximize profits.

The California researchers showed over 200 consumers outside of food stores three pictures of oranges of similar size, shape, and color, but with different levels of thrips scarring. The first picture



Thrips scars affect oranges' marketability but do not affect the edible quality of the fruit.

Figure 1. Consumers Change Willingness To Buy Thrips Damaged Oranges After Receiving Information About Reduced Chemical Sprays



Source: Bunn, Dave, Gail Feenstra, Lori Lynch, and Robert Sommer. "Consumers Acceptance of Cosmetically Imperfect Produce." *Journal of Consumer Affairs*. Vol. 24, No. 2, 1990, pp. 29-37.

was of a cosmetically perfect or standard orange. The other two pictures showed Level One scars (10 percent thrips scarring) and Level Two scars (20 percent thrips scarring).

Respondents expressed strong preferences for the cosmetically perfect orange. Only one-in-twenty were more willing to buy the Level One or Level Two oranges (figure 1). Without any other "purchase clues," appearance appeared to dictate preference.

The consumers were then told that the scarred oranges had received half as many sprays as the standard orange. If a respondent asked if the pesticide was dangerous or inside the fruit, interviewers responded, "I cannot give you additional information. Please make a choice based on what you already know." Consumer acceptance of the scarred oranges jumped to 63 percent for the Level One and 58 percent for Level Two.

Information about reduced pesticide use changed respondents' willingness to accept cosmetic imperfection. The sur-

vey showed that people of all ages, income and educational levels, gender, and ethnicities are equally likely to tradeoff cosmetic quality for lower pesticide use.

The Washington (State) Public Interest Research Group Foundation repeated the survey substantiating the California study. Once again, initial acceptance of the thrips-scarred oranges was very low. Only 6.5 percent of consumers surveyed stated that they would be more willing to buy scarred oranges. However, once told about the lower pesticide level, willingness to purchase rose to 74 percent for Level One and 59 percent for Level Two.

A marketing survey conducted by the New York State Integrated Pest Management (IPM) program found that over 75 percent of respondents would accept blemishes if the fresh produce were certified as pesticide residue-free. Eighty-two percent were willing to pay a premium price of 10 percent or more for pesticide-free produce that had the same appearance and quality as other produce.

Chemical use on produce could be curtailed if consumers would demonstrate less desire to buy overly attractive fruits and vegetables. J. Charles Headley, an agricultural economist with the University of Missouri, has said that consumers could alter the situation "by not insisting on unreasonably high standards."

Less importance placed on appearance has many potential benefits. Reduced chemical use could lower costs for growers, lessen exposure of farm workers, decrease destruction of beneficial insects, and minimize the chance of creating chemical resistance among problem insects. Additionally, the probability of pesticide residues and environmental damage is lessened. ■

References

Alternative Agriculture, National Academy Press, National Research Council, Washington, DC, 1989.

Bealer, Robert C. and Fern K. Willits. "Worries and Non-Worries Among Consumers About Farmers' Use of Pesticides." *Journal of Consumer Affairs*, Vol. 2, No. 2, 1968, pp. 189-204.

Bunn, Dave, Gail Feenstra, Lori Lynch, and Robert Sommer. "Consumer Acceptance of Cosmetically Imperfect Produce." *Journal of Consumer Affairs*, Vol. 24, No. 2, 1990, pp. 268-279.

Burgess, R., J. Kovach, C. Petzoldt, A. Shelton, and J. Tette. *Results of IPM Marketing Survey*, New York State IPM Program, Cornell University, Ithaca, NY, 1989.

Trends 1989: Consumer Attitudes and the Supermarket, Food Marketing Institute. Washington, DC, 1989.

Headley, J. Charles. "A Dilemma for Consumers: Pesticide Use vs. Food Costs." *Journal of Consumer Affairs*, Vol. 1, 1967, pp. 161-169.

King, Kathy, and Tom Zind. "A Profile of Fresh Produce Consumers." *The Packer Focus: Fresh Trends 1989*, Vance Publishing Co., Overland Park, KS, 1989.

Lee, Jong-Ying and Max Langham. "A Simultaneous Equation Model of the Economic-Ecologic System in Citrus Groves." *Southern Journal of Agricultural Economics*, Vol. 65, No. 4, 1973, pp. 175-180.

Miller, Dan and William McClelland. *Is Beauty Only Peel Deep?* Washington Public Interest Group, Seattle, WA, 1989.

Sachs, Carolyn., Dorothy Blair, and Carolyn Richter. "Consumer Pesticide Concerns: A 1965 and 1984 Comparison." *Journal of Consumer Affairs*, Vol. 21, 1987, pp. 96-107.

van den Bosch, Robert, et al. *Investigation of the Effects of Food Standards on Pesticide Use*. Prepared for the U.S. Environmental Protection Agency. NTIS #PB-278-976, 1978.

Zind, Tom. "The Year of Challenge." *The Packer Focus: Fresh Trends 1990*, Vance Publishing Co., Overland Park, KS, 1990.