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Fresh Product Quality, Food Safety and Environmental Concerns

by

Walter J. Armbruster
Farm Foundation
Oak Brook, Illinois

Introduction

The fresh produce industry has a well established marketing system that includes a grading system long used to assure product quality and facilitate trade. It allows year-round access to a variety of fresh domestic and imported produce and provides information that facilitates marketing efficiency.

"U.S. grade standards are developed by USDA's Agricultural Marketing Service and cover approximately 158 different products from up to 80 commodities" (Moulton, p. 19-11). While the use of grades in trading produce is generally voluntary and paid for by user fees, marketing orders for a number of commodities marketed in fresh form require that they conform to specified maximum grade, size or maturity standards. In some cases, Section 8e provisions included in the marketing orders require imports to meet the same standards.

Do current grade standards meet market needs for the foreseeable future? Are changes needed in fruit and vegetable grade standards in light of evolving concerns about pesticide residues in foods and ground water contamination from agricultural chemicals? Do current grade standards, which rely heavily on such criteria as color, uniformity of color, shape, and lack of blemishes, create incentives to use greater amounts of agricultural chemicals than is consistent with evolving consumer and public policy concerns? Are such criteria just "cosmetic," adopted for trade convenience or readily observable manifestations of intrinsic qualities demanded by consumers?

Evidence of Concerns

Increasingly, environmental and health concerns are getting public attention and generating public policy or private actions that affect the fruit and vegetable industry.

A recent survey of Iowa farm operators revealed grave concerns about the safety of agricultural chemicals (Lasley and Kettner).

Research on consumer perceptions have documented consumer concern about food safety as a major issue (Bruhn, Lane, and Walton). Pesticide residues and the use of chemicals in food have been identified as major consumer concerns in polls (Food Marketing Institute) and by university researchers. Certainly fears among consumers regarding safety of fresh produce were heightened by the 1989 cyanide poisoning of Chilean grapes and the Alar incident in the apple industry (Buxton).

Indeed, EPA has classified, and is reviewing, 53 registered pesticides as oncogenic. They "account for 90 percent of all fungicide use, 38 percent of herbicide use, and 40 percent of insecticide use" (Roberts and van Ravenswaay, p. 6). If they are banned, producers would probably face higher production costs at least in the near term.

Testing for pesticide residues has generally found only about one percent of samples containing residues exceeding established tolerances and some residues of compounds not registered for a particular use (Cohen; Greene and Zepp). FDA's analysis of dietary intake in the 1987 "Total Diet Study" also indicates a small exposure to

pesticides (Greene and Zepp, p. 15). While residues greater than tolerances appear minimal, the public remains concerned about the adequacy of tolerances and monitoring (Greene and Zepp, p. 16).

The food industry is responding to those concerns. Some retail grocery chains hire private firms to test samples and certify the lack of pesticide residues on fresh produce, then market their produce as "pesticide free." Increasing amounts of organically grown produce are being sold and more states are establishing standards for defining organic produce.

Public policy proposals or actions and private industry decisions will likely reduce the number of agricultural chemicals available for use by fruit and vegetable producers. The Waxman bill ". . . would amend the Federal Food, Drug, and Cosmetic Act to regulate pesticide residues in food" (Pollack, p. 43). A proposed Environmental Protection Act of 1990 will likely be on the November 1990 California ballot as a referendum item (Fleming, pp. 40-45). Three chemical makers decided to withdraw ethylene bisdithiocarbamates (EBDCs)--the most widely used class of fungicide in the United States--"for use on 60 crops including apples, pears, carrots, celery, cucumbers, squash and tobacco. Use of EBDC fungicides would continue on such important crops as tomatoes, potatoes, wheat, corn, grapes and onions" (Carnevale, p. B1).

Concern about ground water contamination from agricultural chemicals heightens the likelihood that some chemicals will be withdrawn from use in the fruit and vegetable industry. In 1984, 23 states listed pesticides (herbicides, fungicides, insecticides and rodenticides) as a high priority agricultural pollution problem. By 1986, 60 percent of the states listed pesticides as major ground water contaminants in an EPA report (Gould, p. 37-4).

Issues Related to Fruit and Vegetable Production and Marketing

Do current grade standards for fruits and vegetables, which rely heavily on uniformity of size, shape, color, firmness and lack of blemishes reflect intrinsic consumer-desired qualities or only trade convenience? Color may indicate ripeness in many commodities. Other grade standards may indicate marketability and reflect consumer-desired quality characteristics. They were developed to serve the trading needs of distant buyers and sellers and presumably reflect consumer preferences.

But recent "research shows . . . that many quality attributes in fresh fruit are viewed differently by sellers than by buyers. Consequently there is not a clear price signal about what producers should be shipping." This raises a ". . . question of the adequacy of existing grades to foster competition and to meet consumer needs. Industry and government may need to be flexible in changing quality standards to meet consumer requirements" (Moulton, p. 19-11).

Industry representatives are beginning to question the adequacy of existing grade standards. The President-Elect of the Florida Fruit and Vegetable Association thinks the USDA, which grades food on factors like appearance and wholesomeness, ". . . ought to grade on pesticides, if that's what it takes to make the food supply work. If there are concerns, maybe it's time to revise the grade standards" (Thompson).

An environmental coalition has urged Congress to ". . . adopt reforms that seek to: Reduce the emphasis on cosmetic appearance within federal grading standards" and then identify proposals for USDA to adopt grading standards more compatible with food safety concerns (Farm Bill 1990, p. 22).

Greene and Zepp note that as chemicals become unavailable, biotechnology products may substitute for some chemical pesticides. "Biopesticide and genetically engineered pest-resistant fruit and vegetable varieties are currently under development" (p. 16). Integrated pest management, based on monitoring pest damage, is being reemphasized. Increased organic production and/or lowered use of pesticides are very likely in the fruit and vegetable produce industry. But will the resulting produce still meet the standards for current grades? How will the economics of producing and marketing fresh produce that meets current grade standards be altered?

A major issue facing the produce industry is whether changes in current grade standards are necessary, desirable and feasible in order to reduce the incentives to use pesticides to the extent now used. Would consumers accept produce not meeting today's grade standards? What are the economics of production and marketing with fewer pesticides and presumably greater amounts of cosmetically imperfect produce? What technical problems exist in adopting other standards for grading?

Certainly there is some evidence from organic, roadside and farmers markets that at least some consumers find produce not graded according to existing standards quite acceptable,

possibly at a premium--or at least at a non-discounted--price.

There is also technological progress that may be indicative of increasing ability to adopt grade standards other than purely visual ones. For example, USDA Agricultural Research Service scientists can now measure sweetness of melons with infrared light using a small meter that also works for onions and papayas (NFR, p. 48). And progress is being made to use cameras and computer software to spot apple bruises before they are visually detectable. Thus, it may be much more feasible now than previously to develop operational grading systems based on intrinsic quality characteristics rather than on visible cosmetic characteristics.

Alternatives for Fruit and Vegetable Grade Standards

Are there alternatives that might be considered? What might their consequences be relative to today's standards?

Change Standards

One alternative would be to introduce new criteria for grade standards which would eliminate criteria that are related primarily to cosmetic concerns. To effectively adopt different standards would require adopting criteria that reflect intrinsic characteristics desired by consumers. Research is needed to relate various intrinsic characteristics to consumer product acceptance. Research is needed to identify the technical needs, capabilities for grading, and similar problems of implementing different grade standards. Development capital and incentives for creating technical capacity to apply different grade criteria would be needed. Research is needed to assess the economics of such potential for new grades standards criteria.

Amend Current Grades

This approach would allow more minor blemishes to be incorporated into existing grade descriptions. It would be a less drastic and costly alternative than totally revising the basis for grade standards. For example, perhaps a grade A product could allow some thrip damage or healed scars, etc., that would currently disqualify it from being grade A. Perhaps such modification could be tested under some marketing orders before modifying numerous grade standards to incorporate such characteristics.

Eliminate Factors

This approach would call for eliminating certain factors that carry the greatest chemical use incentive and the least certain consumer demand relationship or that have minimal effects on eating quality. For example, shape or color uniformity may be much less important than currently implied in certain grade standards.

Change

Of course, one alternative against which all the others need to be evaluated is continuation of the current grading system. Unless current pesticides are replaced by more acceptable pesticides leaving less residue, this approach could lead to more expensive produce because the yield of fruits and vegetables meeting existing standards could be decreased by new pesticide regulations. It is nearly certain that regional production shifts will occur if certain pesticides are banned without changes in existing grade standards. One would expect a greater concentration of production in the best suited areas. For example, pulling fungicides from the market could preclude production of some commodities in certain states or regions where molds and fungi are more prevalent.

The Challenge

The challenge for all of us interested in the marketing of fresh produce is to work together to explore alternatives. One approach would be to initiate multi-disciplinary research to evaluate the physical and economic factors, including price transmission, that need attention in revising grade standards. In addition, if reduced pesticide use is to be sought, programs to educate consumers about what constitutes quality in fruits and vegetables might be needed and would require cooperative efforts between industry and university personnel.

Some changes in emphasis in the marketing system and marketing institutions will be required by the evolving dynamic, globally competitive produce industry which we are interested in developing and maintaining. A static grading system is inconsistent with such a goal. With the increasing concern about both pesticide residues and chemical contamination of water supplies, the opportunity for innovative change in the grade standards for fruits and vegetables exists.

It is important that the U.S. produce industry carefully consider whether altering U.S. grade standards would hurt the quality image of

its product in the face of increased interest in exporting to Asian and European countries. Perhaps the grading system already allows enough flexibility in quality characteristics to deal with the cosmetically imperfect produce resulting from reduction in chemical use due to concerns about chemical residues and ground water contamination.

Let us work together to examine the range of alternatives and evaluate which will be the most productive for the long-term competitive position of the U.S. produce industry. The Food Distribution Research Society and its membership can lead this effort.

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