Left-Out: An Investigation of Fruit and Vegetable Losses on the Farm

OVERVIEW

As detailed in a previous Natural Resources Defense Council (NRDC) Issue Paper, approximately 40 percent of the U.S. food supply is never eaten. This is a missed opportunity to provide more food to those who need it as well as a massive waste of the resources required to produce that food. Data around how much food is lost on farms is particularly scarce. While the Food and Agriculture Organization of the United States (FAO) estimates that 20 percent of the fruit and vegetable supply is lost during production, little information beyond that estimate is publicly available. As follow up to the initial Issue Paper, NRDC commissioned a survey in July 2012 to gain a better sense of the volumes of fruits and vegetables lost and the drivers behind those losses. This Issue Brief summarizes the results of that survey. Because of the small sample size, the findings should not be considered conclusive. However, they do offer an anecdotal snapshot of farm losses and indicate it is an issue that merits further investigation. The full survey report can be found at http://docs.nrdc.org/health/hea_12121201.asp.

DRIVERS OF FRUIT AND VEGETABLE LOSS AT PRODUCTION

Many different aspects of the current food system prevent fruit and vegetables from getting to market. The following are some of the most prominent drivers cited by survey participants:

- **Overplanting –** Growers run a riskier-than-average business balancing weather, pests, and complex biological systems. Yet, they are required to provide dependable volumes to their buyers. As a form of insurance that they will have enough produce to meet their demand, growers often plant more than their expected sale volumes. The real or perceived cost of being short on an order is greater than the cost growing additional crop that may not get sold. A main concern is that they will lose a customer.
- **Variable market prices –** Produce is often sold on the "spot market," where products are traded for immediate delivery and prices vary significantly. Low spot prices can mean that the costs of harvesting a crop and getting it to market outweigh the revenue from its sale. When this is the case, a grower may decide to leave entire fields of harvest-ready product unharvested. These fields are known as "walk-bys" in the industry, and are particularly prevalent in years of high supply.
- **Labor shortages –** Crops can be left unharvested when skilled labor for harvest cannot be found. Growers report that this challenge has increased in recent years.
- **Imperfect product –** Cosmetic and quality considerations such as size, shape, color, blemishes, and ripeness also factor into whether product is sold, and at what price. For some products, workers are trained to skip over small, misshapen, or otherwise unmarketable pieces and leave them in the field. Sometimes, an entire field will be considered unmarketable and won't be harvested. For products which go to packing facilities, another quality check occurs there, resulting in further "culling," or removal of product. Most of this product is perfectly edible.
- **Anticipatory packing –** Processing and packing facilities often must anticipate their daily volumes in advance of receiving actual orders. When order volumes are not as large as forecast, extra packed product is left at the end of the day and must be gone before closing in preparation for the following day. Often the easiest option is to send it to the dumpster.
- **Shelf-life and spoilage –** More broadly, the costs and logistics of ensuring that products remain refrigerated (which extends a product's life) make donating or finding other markets for produce more difficult, time-sensitive, and costly than, for instance, surplus clothing.

"IF WE PICKED OUR FRIENDS THE WAY WE SELECTIVELY PICKED AND CULLED OUR PRODUCE, WE'D BE VERY LONELY." DAVID MASUMOTO, CALIFORNIA FARMER AND AUTHOR

Source: http://www.sacbee.com/2012/06/24/4583217/not-pretty-but-still-perfect.html#storylink=misearch.

SURVEY METHODOLOGY

The survey was conducted by Milepost Consulting through a small set of in-person interviews with growers and produce packers in Central California in July 2012. A total of 16 large commercial vegetable and fruit growers and packers were interviewed. Where verifiable quantitative data was not available, participants were asked to provide estimates, averages, or ranges based on their experience in the industry. Given the low sample size and unverified nature of the survey, the data in this brief are considered preliminary and anecdotal rather than conclusive. It is NRDC's hope that this preliminary survey will inspire a more comprehensive and robust study in the near future.

Because there is "shrink," or losses, at several points in the farming and packing process, the following framework was established to delineate among different types of losses:

- **Crop Shrink –** The difference between the volume of edible crop available for harvest and the volume sold or donated for human consumption.

  Which is further divided into:

- **Field Not Harvested –** Edible crop that remains in the field or orchard where an entire area is not subjected to any harvesting, also known as walk-bys.
- **Product left in field after harvesting –** Edible crop that remains after a field or orchard has been harvested due to cosmetic, size, or quality characteristics.
- **Product removed during packing –** Edible crop that leaves the field or orchard but is not sold or donated for human consumption.

Furthermore, for this survey, food is considered edible if it is safe to eat and does not contain any known pathogens or toxins, and whose appearance is such that it would likely be eaten by a gardener if grown in his/her home garden.

SURVEY RESULTS

Provided by a small sample size, the following estimates only represent case studies of what actual industry-wide losses might look like. Nevertheless, it is important to note that in some instances, the scale can be quite significant. Interviewees included growers and shippers of the following crops: head lettuce, broccoli, pears, cherries, plums, and nectarines. These crops have different characteristics, and the estimated range of losses was much lower for some than others. It should be noted that the estimates of fields left unharvested were significantly greater than estimates that can be deduced from USDA data on planted and harvested acreage.

Self-Reported Estimates of Crop Shrink by Interviewees (% by weight of total available harvest)		
Field not harvested	**Product left in field after harvesting**	**Product removed during packing**
1-30%	1-4%	2-30%

How much food is this?

If just 5 percent of U.S. broccoli production is not harvested, over 90 million pounds of broccoli are going uneaten.[1] This would be enough to feed every child that participates in the National School Lunch Program more than 11 4-ounce servings of broccoli.[2] In fact, the Farm to Family program of the California Association of Food Banks collected over 5.7 million pounds of broccoli, cauliflower, and celery in the first eighteen months of the program working with just two farming companies.

What are the resource implications?

The resource implications of unused produce are significant. Monterey County, California produces about 40 percent of U.S. broccoli. If 5 percent of broccoli fields in Monterey County were not harvested, that would represent the unnecessary use of approximately 1.6 billion gallons of water and 450,000 pounds of nitrogen fertilizer (a contributor to global warming and water pollution).[3] Considerable amounts of energy, pesticides, and land are also dedicated to product that will not get eaten.

"OF THE PRODUCTS I CULL, FOR EIGHT OUT OF TEN OF THEM, YOU WOULDN'T BE ABLE TO TELL ME WHAT'S WRONG."
- CALIFORNIA GROWER

TOWARD SOLUTIONS

There is a sad irony in this situation. On one hand, the United States is facing a nutrition crisis with record-high obesity levels and hundreds of urban and rural "food deserts" where fresh, nutritious food is difficult to obtain affordably. At the same time, mountains of produce never leave the farm. This is not a problem farmers themselves are causing, nor can they fix it alone. Rather, businesses and citizens have an opportunity to come together and collectively provide new and innovative ways to get more of this healthy food to people, and perhaps more income to farmers as well. Here are recommendations for a few potential solutions to explore:

Further Research

A more comprehensive, detailed study of losses on farms and in packing is warranted. It will be most illustrative to study this issue at the individual crop level to understand the specific drivers and determine which crops have the most opportunity for recovery. It would also be helpful to survey farms of different sizes and with different customer types, as those delineations might change the types of solutions that would work best.

Government

Government can play a lead role in expanding research of food loss on farms. Both federal and state agencies can start by including loss questions as part of existing surveys or conducting explicit studies to provide a better understanding of the crops which have the most excess volumes and the drivers behind that excess.

California and several other states have passed legislation to provide tax credits to farmers who donate their excess produce. This is a new law in California, and effort should be made to ensure growers are aware of it. The federal government should follow suit with federal tax credits for food donations.

Public purchasing dollars could be used to expand secondary markets for excess produce, including through distribution in schools or other public facilities. Both public and private institutions might consider concurrent picking, where off-grade produce is harvested alongside market grade product (but packed separately).

In addition, the government can keep an eye towards helping growers and farm workers to address the challenge of labor shortages.

Business

Both large and small businesses purchasing food can help by experimenting with more flexibility in their procurement. For some, such as restaurants and hospitals, this might be placing an order of "plums or other best stone fruit," for example, instead of just "plums". For others, such as large food retailers, this could be establishing margins of error that allow for growers to occasionally come up short on volumes without penalty. This flexibility could ease the pressure to overplant as well as allow for sale of surplus in some cases.

Food donations already occur on a regular basis, and a national food recovery network successfully delivers food to those in need across the country. However, significant volumes could still be recovered. To address logistical challenges around distributing food donations, companies can donate space in their trucks as product is moved around the country. This could help to expand the geographical reach of fresh produce donations. Outreach and educational materials for businesses that outline the tax benefits, legal protections, and available resources around food donations could help increase this practice.

Collaboration and information-sharing across the supply chain could go a long way in reducing surplus produce. A good start would be to bring together representatives from across the supply chain to brainstorm solutions

Food businesses across the supply chain should also consider innovations in farm worker management that will help address labor shortages.

There is room for creativity too, and entrepreneurs will recognize there could be a real business opportunity to access surplus product and find new markets for it.

Consumer

Individuals can help by being more tolerant of how produce looks on the grocery store shelves. Buy "funny fruit"! That small orange or bent cucumber will taste just as good and buying them will send an important message up the supply chain that taste and nutrition of our fruits and vegetables are valued more than their perfect appearance.

1 USDA Economic Research Service, "US Broccoli Statistics" report 1.8 billion pounds of broccoli were produced in 2010.

2 About 31.8 million children participated in 2011. http://www.fns.usda.gov/cnd/lunch/AboutLunch/NSLPFactSheet.pdf.

3 Assumes 24 ac-in of water and 180 pounds of nitrogen per acre, according to averages for Central Coast production derived from "Broccoli Production in California," UC Vegetable Information and Research Center: http://anrcatalog.ucdavis.edu/pdf/7211.pdf. Acreage from 2011 Monterey County Crop Report: http://ag.co.monterey.ca.us/assets/resources/assets/252/cropreport_2011.pdf.