

From Adam and Eve to Adams County, Pennsylvania:

a history of the American apple

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December 17th, 2011

Mexican Migration Mosaic, Fall 2011

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Table of Contents

Introduction.....	2
Methodology.....	2
The Early History of the Apple.....	3
Apples in American Culture.....	6
Current production and consumption of apples in the United States.....	8
Figure 1. Percentages of different apples uses in the United States.....	9
Apple production in Pennsylvania.....	10
The Fruitbelt: Adams County, Pennsylvania.....	11
Conclusions.....	34
Works Cited.....	36
Appendix.....	38

Introduction

This research focuses on the history of the apple in America through a case study of the apple industry in Adams County, Pennsylvania. The Dickinson College Mexican Migration Mosaic class of fall 2011 focused on this region as a continuation of research begun by previous Migration Mosaic courses in 1998 and 2003. A strong emphasis will be placed on how images of the apple in American culture have come to be associated with patriotism and the typical white, middle class family, and how these images marginalize and obscure the integral role of migrant farmworkers in the apple industry. In an increasingly globalized world, it is imperative that societies and individuals understand the complexity of systems and their role within them. A case study of the apple industry in Adams County unveils the inextricable dependence of the industry on migrant labor despite increasing nativist and anti-immigrant sentiment that has surfaced in recent decades, calling into question common perceptions about not only the United States' tolerance as an immigrant nation, but also the apple and the US food system as a whole.

Methodology

History about the apple was gathered from a multitude of secondary sources, most notably Michael Pollan's *The Botany of Desire*. In order to understand the historical context of the Adams County apple industry, secondary sources and historical accounts of orchardists and growers in Adams County were examined. I garnered an understanding of the current apple industry primarily through interviews with two apple growers, Jim Lott of Bonnie Brae Orchards in York Springs and Ben Wenk of Three Springs Fruit Farm in Aspers. I chose to examine one conventional, commercial wholesale grower and one farmer who helps manage a diversified fruit and vegetable farm with Food Alliance certification in order to establish a broader view of the industry and its development over time. I also relied on previously conducted interviews from

the 2003 Mosaic and Joe Benz's recent interview with Jim Lott. I participated in interviews with Rico, the farm labor contractor at Bonnie Brae, and a female picker at Bonnie Brae, to help understand the viewpoint of the migrant workers. A tour of the Knouse Foods Peach Glen Plant and personal communication with the current Director of Human Resources Scott Briggs there provided valuable information about the processing of apples in Adams County and more generally throughout the industry. I also looked at primary sources provided by the U.S. Apple Association, including letters and testimonies of growers and apple industry representatives, to gain an understanding of the industry's current stance on issues such as pesticide use, immigration reform, food safety regulations, and more.

The Early History of the Apple

The first bite of a crisp, juicy apple may not always invoke thoughts about the complex nature and history of the fruit. Likewise, the average apple eater knows little about the steps it takes to transform an apple from seed to the shining, perfectly shaped fruit nestled deep in towering supermarket displays. Yet as with most commodities in today's increasingly globalized food system, there is more to the apple than meets the eye.

The apple is a pome fruit, a botanical classification meaning "fleshy fruit." Alongside pears, apples are set apart from stone fruits like peaches, plums, and cherries, which have characteristic hard, stone-like pits (Knouse Foods Inc. 2010). However, all these fruits have one thing in common: they have been modified by humankind to meet anthropogenic needs since even the earliest civilizations.

Thus the modern day apple is a product of years of cultivation and science deeply rooted in human history. Long before apples were cultivated by humans, they are said to have grown wild in Central Asia and China. During the Stone Age, inhabitants of what is now Europe

cultivated apple trees, as did the ancient Lake Dwellers of northern Italy and Switzerland in 3000 B.C. The Greeks and Romans cultivated apples and brought apple cultivation techniques to England in the first century B.C. through conquest. In later years, the Spaniards are believed to have brought apples to Mexico and South America. In 1629, the Pilgrims of the Massachusetts Bay Colony planted apple seeds. In the spirit of manifest destiny, pioneers moving westward brought apple seeds with them, spreading the fruit across the continental United States (Knouse Foods Inc. 2010).

These first apple seeds planted in America were varieties cultivated for centuries across oceans and in highly varied climates. When the colonists first arrived in North America, the only apple variety native to the continent was the Sour Crab apple, a far cry from the sweeter varieties Americans now enjoy. Rather than cultivate this variety, apples were shipped from Europe during the 17th and 18th centuries to satisfy colonist demand (Pennsylvania Apple Marketing Program, 2010). The fact that it was easily stored and kept during long ship voyages made the apple a stable commodity, and as such its travels continued. In the colonies and eventually in a newly formed America, apple production grew and became a popular addition to many families' small farms: "apple production on small 19th century farms was only one of the many home industries that made the families nearly self-sufficient. Farmers cooperated by exchanging scions of favorite trees and even by sharing storage space for excess apples or cider" (Hamwey, 1999, p, 12). The exchange of scions, also known as grafts, was the primary way of promoting certain successful varieties and trees. This technique is still used today:

...Once a desirable variety is bred or discovered, branches from the tree are "budded" to a size-controlling rootstock. "Bud-wood," or branches with several "buds," are collected from the desirable tree. Buds are areas that sprout in the spring to form new branches and blossoms. The buds are carefully cut from the branches and inserted into a rootstock, which has already been planted in a nursery field. The bud heals into the rootstock and eventually sprouts a branch, which will become the young tree (Knouse Foods Inc., 2010).

Once a common agricultural technique practiced by individual small farmers, the budding of fruit trees is now considered somewhat of a science and is often done on a large scale by nurseries: “the budding of fruit trees requires very precise and technical skills. Nurseries must grow the rootstocks and also maintain blocks of trees to be used for bud-wood” (Knouse Foods Inc., 2010). This method is the most common for introducing new varieties and cultivars of apple trees. On the opposite end of the spectrum is the “chance seedling,” which is nothing more than a product of unintentional breeding and natural pollination processes. While a chance seedling may be genetically unique with characteristics later determined to be valuable for pointed cultivation, a chance seedling is simply a young tree produced entirely by the forces of nature. Both the Red Delicious and the Granny Smith apple, two of the best-known apple varieties in the US, are the product of chance seedlings (Knouse Foods Inc., 2010).

While both methods of apple cultivation have been used for centuries, “anyone who wants edible apples plants grafted trees, for the fruit of seedling apples is almost always inedible” (Pollan, 2001, p. 9). Grafting has been a necessary technology for the cultivation and commercialization of the apple due to its very nature. In botany, the term heterozygosity signals that each of the seeds in an individual apple contains the genetic material for an entirely new, unique apple tree that once full grown would bear little resemblance to its parent trees. While heterozygosity is not unique to the apple, “in the apple the tendency is extreme.” Without grafting, every apple would constitute a new variety, ephemeral and transient in its inability to be replicated beyond the life of the original tree (Pollan, 2001, p. 10). In this way, the grafting process and scientific breeding have become primary vectors leading to the current 2,500 varieties of apple presently being grown in the United States (Knouse Foods Inc., 2010). Unfortunately, “modern supermarket varieties of apples are a poor representation of the hundreds

of varieties available in the past, which were selected to suit the special needs or tastes of the early farmers” (Hamwey, 1999, p.8). They represent a mere fraction of the 7,500 varieties grown throughout the world, and yet even fewer of the 2,500 are widely available to consumers. The number of apple varieties available to consumers has decreased despite their heightened popularity.

Apples in American Culture

The apple is more than just another supermarket item in America. The apple has become ingrained in American culture and now occupies an interesting and ever-evolving role in public discourse. Arguably the earliest popular images of the apple come from the Bible. The apple is believed to be the forbidden fruit from the Garden of Eden: Eve’s inability to resist the temptation of the illustrious apple catapulted humanity out of innocence and into the complexities of the modern world, or so the story goes. While the Bible never specifically names the apple as the forbidden fruit, popular thought has effectively done so.

Images of discovery and innovation are also represented by the apple. It was an apple that fell from its branch and hit Sir Isaac Newton in the head, spurring his discovery of gravity. Henry David Thoreau, arguably one of the best thinkers and writers of nineteenth century America, wrote an essay on the “Wild Apple.” In the essay, Thoreau likens the history of the apple tree to the history of man through its evolution and travels westward. He implies worry that eventually, cultivation and its link to man will lead to the loss of the original, wild apple:

...It is “the most civilized of all trees...It has been longer cultivated than any other, and so is more humanized; and who knows but, like the dog, it will at length be no longer traceable to its wild original? It migrates with man, like the dog and the horse and cow: first, perchance, from Greece to Italy, thence to England, thence to America; and our Western emigrant is still marching steadily towards the setting sun with the seeds in his pocket, or perhaps a few young trees strapped to his load (Fink, 1986, p. 216).

In the end, Thoreau's fear about the loss of the apple's wild heritage is linked to the images of Johnny Appleseed and manifest destiny. Johnny Appleseed and his adventures are inextricably linked to the history of the American frontier and a young pioneer traversing the continental United States with a bag of apple seeds. The true history of Johnny Appleseed, born John Chapman in 1774, has been chronicled many times (Knouse Foods Inc., 2010).

The apple goes beyond history and crosses the boundary into American culture. From apple pie on Thanksgiving, a holiday associated with the birth of America, to apple picking in the fall, images of the apple are deeply ingrained in the concept of the idyllic American family and experience. A recent Internet article stated, "a 'Rockwellian' anything immediately communicates idealized family life to many Americans. As does 'apple pie' and the 'kitchen table'" (Glass, 2011). Apple pie has also become a symbol of patriotism and national pride. A newspaper article published in 1902 declared, "No pie-eating people can be permanently vanquished" (Wikipedia, 2010). During World War II, apple pie was glorified in the phrase "for Mom and apple pie," which allegedly was the stock answer of American soldiers when asked why they were going to war. The 1970s brought an advertising ploy evoking patriotism with the jingle, "baseball, hot dogs, apple pie and Chevrolet." Today, the phrase "as American as apple pie" has become popularized to the point that it is now widely used to describe anything that is typically American (Wikipedia, 2010). Apples and apple pies also evoke nostalgia, patriotism, and a desire for a wholesome American lifestyle. The perfect American housewife and mother might give her honor student a shiny, red apple to give to her teacher. That shining symbol of wholesome innocence may even sit at the front of the class on the teachers' desk.

Advertising and marketing have also pushed apples as a representation of health and nutrition, with phrases like "an apple a day keeps the doctor away." Many claim that this slogan

was dreamed up during Prohibition to redefine the apple as an important food item rather than the primary ingredient in the then incredibly popular hard cider. “In 1900, the horticulturist Liberty Hyde Baily wrote that ‘the eating of the apple (rather than the drinking of it) has come to be paramount,’” while the previous two centuries were marked by praise for the apple in the name of alcohol (Pollan, 2001, p. 22). Ultimately, this slogan and others have been successful in framing the apple as a key aspect of a healthy lifestyle. The apple industry and scientists have published hundreds of studies on the health benefits of eating apples and promoted them as fat, cholesterol and sodium free while still being rich in fiber and low in calories (Knouse Foods Inc., 2010). These images have been widely successful in promoting apple products as wide ranging as apple juice for children to pre-packaged apple slices in McDonald’s Happy Meals.

The apple is no longer just another piece of fruit on the food pyramid: the apple has become a cultural symbol valorized as patriotic, wholesome, and necessary for a healthy lifestyle. An apple is the symbol of Apple Computers, a beacon of innovation and progress in America. Lovers refer to one another as “the apple of my eye,” and thousands of Americans both young and old have listened to Don McLean say goodbye to the life of the 1950s and white, middle-class suburbia in “Bye, Bye Miss American Pie.” Countless children and parents have cringed watching Snow White emulate Eve in her foolish inability to resist the poison apple in a favorite Walt Disney classic. Through its widespread ability to represent the idealized “American experience” in a delicious and nutritious edible form, the apple has become irresistible.

Current production and consumption of apples in the United States

The typical American consumer eats about nineteen pounds of fresh apples each year, which represents an average of only about an apple a week (Knouse Foods Inc., 2010). However, fresh apples account for roughly sixty-five percent of the total US apple crop. An additional 34.5

percent is processed and one percent is never marketed to consumers. Of the 34.5 percent that undergoes processing, 15.7 percent is used in juice and cider; 2.1 percent is dried; 2.1 percent is frozen; 12.2 percent is canned and 1.1 percent is consumed as fresh slices. Apples are also commonly used to produce baby food, apple butter, apple jelly, and apple vinegar (Knouse Foods Inc., 2010).

In 2008, the average U.S. consumer ate an estimated 16.4 pounds of fresh-market apples and 33.3 pounds of processed apples, for a total of 49.8 pounds of apples (US Apple, 2010). However, about 6 percent of this fresh apple consumption is imported, primarily from Chile, New Zealand, Canada, Argentina and Brazil (US Apple, 2010).

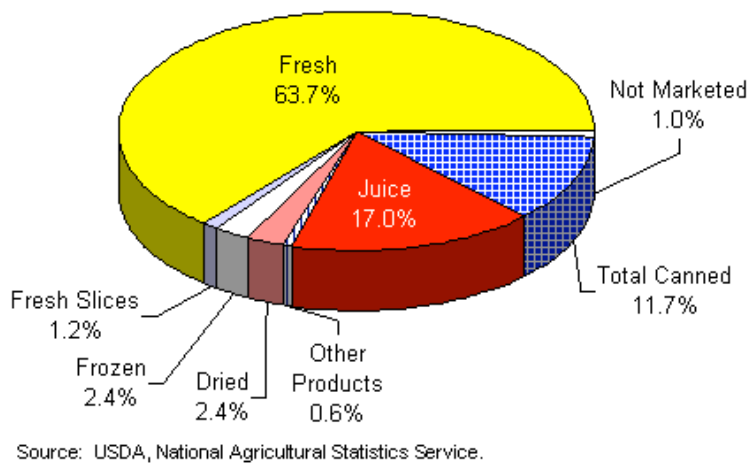


Figure 1. Percentages of different apple uses in the United States.

The majority of U.S. apples consumed domestically are also grown domestically. The United States is the second largest global producer of apples after China. Within in the United States, the top four apple growing states in order of decreasing production are Washington State, New York, Michigan and Pennsylvania. However, every state in the continental US grows apples to some extent (US Apple, 2010). In 2009, preliminary numbers showed that 9,953.6 million

pounds of apples were produced, of which 9,739.1 million were utilized. Today, the annual apple crop grown in thirty-five states averages over 200 million bushels (Knouse Foods Inc. 2010). A bushel is the standard measure for apples, with one bushel equal to 42 pounds of apples (Mac Lott, personal communication, 2011).

In 2007, there were 25,591 farms with apples in the country, down from 41,187 in 1982. The number of acres under apple production also decreased from 590,541 acres to 398,770 during the same time period (US Economic Research Service, 2010). The yield per apple bearing area in acres also increased dramatically between 1980 and 2009, jumping from 19,400 to 28,600 pounds per acre (US Economic Research Service, 2010). These figures demonstrate the growing trend that has characterized United States agriculture for the past century, a decline in the number of farms coupled with an increase in both acreage and yield. The increases in large farms and productivity in terms of yield per acre have had a drastic effect on the economics associated with apple production in the United States.

Apple Production in Pennsylvania

A similar trend can be seen on a smaller scale in Pennsylvania, the fourth largest producer of apples in the US. The diverse climate and soil conditions of Pennsylvania allow for production of hundreds of different varieties of apples. The state annually produces roughly 11 million bushels, or 440 million pounds of apples. Of these 11 million bushels, about 3.8 million bushels are destined for the fresh market and 6.4 million bushels are processed. In 2010, there were 21,000 acres of Pennsylvania land bearing apples, contributing more than \$700 million to the state's economy. Approximately \$3 million of the total \$700 million was coming from exports to countries in Central America as well as Israel and India. The bulk of this production occurs in the top apple-producing counties, namely Adams, Franklin, Bedford, York, Berks,

Lehigh, Lancaster, Snyder, Schuylkill, Cumberland, Erie, Lycoming, Centre, Columbia, and Chester (Pennsylvania Apple Marketing Program, 2010).

Between the 1982 and 2007, the number of farms with apples in Pennsylvania dropped from 2,580 to 1,886, accompanied by a simultaneous decrease in number of acres from 39,150 to 23,552 during the same time period (US Economic Research Service, 2010). Between 1982 and 2009, the average yield in pounds per acre of apples for Pennsylvania grew from 19,400 to 23,100 (US Economic Research Service, 2010).

The Fruitbelt: Adams County, Pennsylvania

Adams County has long been known for its fruit belt, a four to six mile wide swath of land extending along the east slope of South Mountain in south-central Pennsylvania characterized by sloping land, a “critical feature ...because it allows for air drainage; that is, heavier cold air drains down into the valleys, sparing sensitive fruit trees from frost damage” (Adams County Fruitbelt, 2009, p. 944). Despite knowledge that the area had special attributes favorable for growing tree fruits in the early nineteenth century, the Adams County Fruitbelt began in the context of diversified farming and became more specialized over time. “No matter where it was located, a typical Pennsylvania farm in about 1850 had an orchard, and apples were its mainstay” (p. 946). On most farms, there would be anywhere from several dozen up to fifty trees. “Apples might be sold, bartered, or used on the farm. Besides raising apples to eat fresh (and storing them for winter use), farm families made cider, dried apples, and apple butter. Fallen fruit was often fed to hogs” (p. 946). It wasn’t until the latter half of the nineteenth century when access to transportation increased and a harmful plague of pests provided opportunities for new growers. These conditions spurred rapid growth between 1905 and 1925, during which Adams County became the first-ranked county in Pennsylvania for apple

production.

In 1927, the Lott family started Bonnie Brae Orchards in what is now York Springs, Adams County. The farm started small and has been growing through the generations. Jim Lott is a third generation apple grower. Born and raised in the orchards, Jim grew up working alongside his father Mac, who had taken over the farm from his father in the 60s and incorporated it in 1962. After going to college at Michigan State, Jim returned home in the early 1990s and took over management of the farm. He is still in the process of purchasing the farm from his father. Jim lives on the orchard with his wife and three children. His oldest child, Sarah, is currently studying agribusiness at Michigan State and is considering working on the farm after graduation.

The orchard now has 800 acres of fruit in production, 663 of which are apples. They also produce pears and peaches. Jim says this is a fairly big orchard in relation to other fruit farms in the area, but he has no plans of expanding in the near future.

...I think the majority of farms will get larger because there will be fewer people farming. I think the majority of it will stay in fruit around here. We have a great location for it, one of the best in the country. And the industry is here. Knouse Foods, Rice Fruit Company right down the road, and nearly half the country's population is within two hours of trucking. We certainly have advantages here. I think it will stay (Lott, 2003, p. 8).

The middle of the twentieth century was characterized by the advent of the modern food system, which prompted significant changes nationwide. Large grocery store chains replaced smaller, specialized stores while agriculture became increasingly reliant on heavy machinery and petroleum-based inputs. Efficiency and mass production were upheld as ideals in the agricultural sector while the advertising and marketing sector appeared and flourished. Another major change

was the beginning of inexpensive year-round availability of exotic fruits such as oranges, bananas, and grapefruit. Fortunately for apple growers, overall fresh fruit and vegetable consumption was rising in the US and the apple industry was not drastically affected.

Apple growing regions were undergoing similar changes nationwide, although some notable differences existed between Eastern growers and those in the Pacific Northwest and the West Coast. While farms on the East Coast remained primarily family owned, large corporations began consolidating power in the West. Western growers also more focused on marketing and catering to the specific tastes and demands of consumers. Eventually, competition between the apple producers in the eastern and western states intensified as the Pacific Northwest gained prominence: “lower costs, innovative cultivation methods (such as dwarfing rootstock), shrewd assessment of consumer preferences, aggressive marketing, inexpensive labor, better weather, and cheap, essentially government-subsidized transportation” gave them an advantage over those in the east (Adams County Fruitbelt, 2009, p. 967). However, innovations eventually made their way to the east as well.

Jim’s father brought dwarf trees to Bonnie Brae orchards sometime in the 1950s. He had learned about it at Michigan State after the idea had been brought over from England’s East Mulling Research Station. Now “you get more trees per acre and you get into production a lot sooner” (Lott, 2011, p.7).

Dwarf trees are trees that have been bred to be much smaller than a typical apple tree. This is advantageous because dwarf trees can be planted at a much higher density, increasing the number of apples that can be produced per acre. They are also a more efficient tree as less of their energy is expended in establishing a trunk and branches: more energy can go to producing fruit. Dwarf trees bear fruit within two years of planting, in comparison with larger trees than

take between six and seven years.

Another major change of the mid-twentieth century at Bonnie Brae was a switch in the way the apples were picked and transported.

Jim's father made the switch from bushel crates moved by hand to 25-bushel bulk bins driven by forklifts in the 1950s. Between his father and his grandfather's generations, picking moved away from doing everything in bushel crates. "They would pick [the crates] up in the orchards in the carts and put them on metal sleds, and you're thinking of sled with runners on 'em, but these were just a wide piece of metal kept close the ground so that they could drag them out of the orchards then and put them on a truck and haul 'em to the plant." Then they would dump the apples on the ground and scoop them up a hoe or something similar to process them. "They moved from the bushel crates to 25 bushel bulk bins driven by forklifts" (Lott, 2011, p. 7).

The 25-bushel bins were originally scattered in the orchards by Jim or his father and one picker would be assigned a certain number of bins to fill by himself, depending on his skill. Workers were paid by the full bin and would pick as many as possible in a day. Now, a new system is used where roughly five bins are put on a wagon and driven to the orchard to be picked collectively by a crew of workers. When this system was first in place, crews collectively filled the bins and at the end of the day, the value of the total bins was split evenly among all the pickers. Today, pickers are given individual bushel bags to fill. When a picker fills his or her bag, it is emptied into the larger 25-bushel bins. Scanners are used and individual barcodes are assigned to each picker, so that whenever a picker empties a bushel bag, they scan their barcode. The data from the scanners is then transferred to computers and used to calculate payroll based on individual pickers.

Jim prefers this system because it saves him time early in the season, time he used to

spend scattering bins throughout the orchards. Rather than waste time driving through the orchards, Jim can drive a tractor full of bins to one orchard site to be picked that day. Time saved allows Jim to help with the picking. He also loves the system because it incentivizes workers to pick faster and be more careful with the fruit. It's much easier for him to tell if a worker is bruising the fruit or picking slowly with the 25-bushel bins and the scanning system. "It increased my output or production per day dramatically," he says: this simple change led to a 12 to 15 percent increase in daily output. It's also fairer for the workers, who are paid based on their individual ability rather than the productivity of the group. Jim says that productivity of the workers and the resulting pay increased for all except the least capable pickers (Jim Lott, personal communication, 2011).

The 25-bushel bins were originally large wooden crates that cost the growers roughly eighty to ninety dollars a bin. In recent years there has been a push to switch to plastic bins, which are cleaner, easier to use and more efficient for the packinghouses. Knouse Foods, a growers' cooperative in Adams County, has a plastic bin rental system for growers who can't afford to pay the 135 dollars up front for a new plastic bin (Scott Briggs, personal communication, 2011).

Computerized air-blast sprayers for spraying the apples with pesticides have also changed the way apples are grown. The air-blast sprayers have sonar eyes doing "smart sprays", which means that if the sprayer doesn't detect a tree or detects one that is shorter than the previous tree, the sprayer can adjust the level it sprays at or shut off all together. Not only does this reduce pesticide input by about 25 to 30 percent, it reduces pesticide drift.

Jim likes the air-blast sprayer because it reduces his pesticide input. This is increasingly important as prices of pesticides are constantly increasing. Jim talks about pesticides getting

“softer” and more specific: gone are the days of broad-spectrum pesticides like DDT. While the weight of the pesticides Jim sprays are decreasing, the cost increase keeps overall costs relatively high. “I would just hope not to spray at all, would be a great thing, but people won’t buy ugly fruit. I know that ‘cause I grew them this year and nobody would buy them” (Lott, 2011, p. 17).

Conventional apple growers are forced to use a variety of chemicals to control pests and other diseases that affect apple trees. One of these is endosulfan, a pesticide used to control aphids and other sucking insects that attack apple trees. In 2009, endosulfan was being assessed by the Environmental Protection Agency’s (EPA) Biologic and Economic Analysis Division (BEAD) and alternative methods of pest control were being considered. The U.S. Apple Association (USApple, 2010), the national trade association representing portions of the apple industry, lobbied the EPA in favor of the chemical, citing its superior ability to treat infestations of the Woolly Apple Aphid. Concerns about the availability and review status of other chemicals suggested as alternatives were also voiced. Conventional growers are often highly dependent on these chemical sprays to treat pest, fungus, and other disease problems. Apple scab fungus, for example, is another recurring and continuous problem for the growers of Adams County, and is generally solved by the use of a fungicide. USApple opposed restrictions on endosulfan and other chemicals, arguing,

...As the agency restricts the use of the remaining crop protection tools, growers are left with fewer options to control key apple pests. These restrictions are forcing growers to rely on fewer materials, setting the stage for increased insect resistance. Additionally, most of the newer alternatives are significantly more expensive. Pests which were once considered secondary concerns may now become more difficult to control as broad-spectrum uses are either canceled or restricted... (Seetin, 2009).

These challenges leave growers worried that they will be unable to afford the increasingly expensive chemicals and their apples will suffer as a result. However, improvements in

technology like the air-blast sprayer are ameliorating these issues for the time being by reducing the quantity of chemical necessary. Alternatives to chemical use, such as Integrated Pest Management (IPM), are also gaining popularity. “Advanced integrated pest management and more effective biocontrol methods have recently been successfully used in northeastern US orchards” (Peck et al., 2010). These methods reduce the need for expensive chemicals and in some cases have been proven to be less harmful to the environment. IPM is a major component of many organic and environmentally sound certification systems, such as Food Alliance certification. Many farmers and orchardists are aware of IPM practices and implement them, with or without recognition, as a way to decrease chemical inputs. But the lack of organic and third-party certified orchards in the Northeast is telling of the general reliance on chemicals.

A comparison study of integrated and organic fruit production in a high-density commercial orchard of disease-resistant Liberty apples in New York State sheds light as to why this might be so. Integrated fruit production is a “science-based system that uses biological and chemical pest controls based on monitoring to assess damage-action thresholds, selection of disease-resistant and locally adapted fruit and rootstock cultivars, strict limits on fertilizer applications determined by crop nutrient status and soil fertility tests, a short list of permissible and restricted pesticides, and on-farm inspection to certify that growers are following IFP regulations” (Peck et al., 2010). This contrasts with organic agriculture, which is regulated by the United States Department of Agriculture’s (USDA) National Organic Program (NOP), in that organic agriculture restricts inputs to those that are naturally derived and forbids synthetic pesticides and fertilizers.

The study found that there was a significantly wider range of total damage, either internal or cosmetic, for apples grown organically. The same was true for insect damage. Furthermore,

organically produced fruit had a higher negative impact on the environment due to extensive use of alternative pest control methods, such as kaolin clay, lime sulfur, and fish oil. The study found that organic production costs were 9 percent higher while direct market prices were only 6 percent greater. Wholesale market prices were 11 percent higher for apples produced using integrated fruit production methods. The study concluded that integrated fruit production could be widely implemented in the northeastern United States if market incentives promote its adoption. While producing disease-resistant apples under an organic fruit production system demonstrated potential, the reduced profitability of the apples due to pests, small size, and poor finish would require a price premium (Peck et al., 2010).

Integrated fruit production has been successfully implemented by Ben Wenk, a seventh generation farmer and junior partner at Three Springs Fruit Farm in Aspers, Pennsylvania. Three Springs is a 450-acre diversified fruit farm where Ben's great-grandfather began growing apples commercially after the Great Depression. Since then, the Wenk family has been growing apples for profit on some scale. They now grow just about all tree fruits as well as some small fruits and berries. They've recently started growing specialty heirloom vegetables.

Three Springs Fruit Farm is also the only Food Alliance certified orchard in all of Pennsylvania, Maryland, Delaware, New Jersey, Virginia, Ohio and Michigan. Food Alliance certification is a comprehensive third-party certification for social and environmental responsibility. "We were doing a lot of these practices on our own, we just felt like it was the right thing to do whether or not we got credit for it. With the certification, we felt like we were getting ahead of the game... and finally getting credit."

Food Alliance certification uses integrated fruit production practices, notably encouraging advanced IPM while still allowing the limited use of chemicals. Ben and the other workers on the

farm spend extra hours monitoring and recording populations of insects like the Codling Moth and Oriental Fruit Moth that can lead to wormy fruit. Knowledge of these populations helps to determine when spraying is absolutely necessary: “this means less pesticides in the environment, less on the fruit, and more ...beneficial insects.” The Wenks also use growing practices borrowed from organic production, such as pheromone mating disruption. Artificial moth sex pheromone is spread throughout the orchards to confuse pests and prevent mating and thus proliferation (Ben Wenk, personal communication, 2011).

Whether orchardists and farmers in Adams County go the route of Jim Lott or Ben Wenk, there is a notable focus on reducing pesticide inputs to reduce production costs and protect the environment. Jim’s use of the air-blast sprayers “smart sprays” and Ben’s focus on advanced IPM have both been successful methods for controlling pests and improving the quality of the fruit they produce. While studies have shown organic apple production to be feasible and national trends suggest farms are converting at an ever-increasing rate (Peck et al., 2010), Jim says he doesn’t picture more farmers in Adams County switching to organic production in particular (Jim Lott, personal communication, 2011).

Despite differences in their growing practices, both Ben and Jim are subject to increasing food safety regulations. Many growers in Adams County feel increasingly frustrated by these laws and regulations that are increasingly broad and based on large-scale agribusiness operations where food safety is a more serious concern.

Inspections and regulations are getting worse all the time for Ben and his family. Food safety regulations in particular are becoming more and more absurd. “Nobody is more invested in having a safe product than the grower is...there has never been a food borne illness associated with fresh apples.” While this is different for processed products like applesauce or

cider, these regulations often fall outside the realm of the growers. “We would like to see food regulations that are specific to each crop rather than lumped with a large spinach operation in the Napa Valley in California. E.coli getting to an apple on a tree is different from a spinach plant, which is low to the ground and uses flood irrigation.”

Jim agrees. “We are getting a lot of pressure now for food safety, that’s new...but we go through food safety audits here and we’ve been going through them for several years now.” He reiterates that no one has been reported sick from the direct consumption tree fruits: “they aren’t on the ground like cantaloupes and tomatoes and lettuce and anything else that people get sick from are down on the ground where it’s a target. It’s hard to contaminate the fruit in the tree- you got to really try. But that’s becoming a bigger issue, farm safety” (Lott, 2011, p. 11).

USApple has taken a similar stance on food safety regulations and has issued a public position stating that “USApple believes food safety practices should be risk-based, commodity-specific, and reflect sound science to help ensure consumers are provided healthy and nutritious apples and other produce items” (USApple, 2011). In July, the Food Safety Enhancement Act of 2009 passed the House, followed in October 2009 by the Senate’s passage of the FDA Foods Safety Modernization Act. Both bills proposed increased authority for the FDA to impose food safety laws for growing, harvesting and packaging of “high-risk” fruits and vegetables. While neither bill has been passed into law, the apple industry voiced concerns that new or increased regulations would impose additional registration fees, paperwork and other burdens on growers and industry members. USApple promotes only those new regulations that “apply equally to small and large producers, organic and conventional, and domestic and imported apples and apple products” (USApple, 2011). While food safety regulations are a growing and important issue for the globalized food system, it is imperative that regulations be fair and reasonable so as

to protect consumers without impeding the success of an industry.

Despite food safety regulations and numerous other challenges, the Adams County apple industry has flourished over the years with the help of innovations and changes in industry practices. As orchards have evolved, the processing and packing industry has flourished as well. Between 1954 and 1959, when orchards were getting larger and the processing industry began to develop, Adams County became a national leader in processing. Local companies like Musselman's, Motts, and Rice gained national prominence producing canned apples for pies, apple juice, vinegar, cider, and applesauce. Growers began producing fruit specifically for these large processors while simultaneously growing new, more visually appealing varieties of apple for the fresh market (Adams County Fruitbelt, 2009).

In Adams County, Knouse Foods Cooperative, Inc. and Rice Fruit Company are the two primary companies that growers produce for. Knouse Foods is a growers' cooperative that was founded in 1949 on the initiative of fruit growers in the area. Growers sell their apples directly to Knouse for processing. Knouse produces everything from applesauce to apple cider to pie filling, processing apples, peaches, and cherries primarily. Over the years, Knouse has acquired other brands and manufactures products under these labels, including Musselman's Lucky Leaf, Speas Farm, Lincoln, and Apple Time. Knouse is the biggest employer in Adams County, with roughly 1,300 employees at six plants, five of which are located in Pennsylvania. Most of these employees are full-time, year-round employees, although some additional part-time seasonal help is hired during harvest time. In terms of the worker demographics, 62 percent are male and 38 percent are female. Furthermore, 55.3 percent are classified as white, 3.6 percent black, 39.4 percent Hispanic, 0.5 percent Asian, 0.8 percent American Indian, and 0.4 percent are classified as mixed race but are not identified as Hispanic (Scott Briggs, personal communication, 2011).

Due to the large percentage of Hispanic employees, Knouse now has a Human Resources department that employs both English and Spanish-speaking staff members to provide services to Hispanic workers (Knouse Foods Co., 2010 and Scott Briggs, personal communication, 2011).

On the other end of the spectrum is Rice Fruit Company, a fresh apple packing facility begun in 1913. Rice Fruit is the largest facility of its kind east of the Mississippi and annually packs over a million bushels of apples and peaches. Much of the fruit packed by Rice today comes from R&L Orchard Company, which began in 1955 as a partnership between William Lott, Jim Lott's grandfather, and Arthur Rice Jr. However, Rice also packs fruit for roughly 75 other fruit growers, most of whom are located in Adams County (Rice Fruit Company, n.d.).

Rice Fruit Company and Knouse Foods are not competitors, but rather two distinct markets that manage apples in very different ways for the market. How and what a grower decides to produce determines which company he or she will primarily do business with. For example, different varieties are grown for the processing market and the fresh market, and as such fetch different prices as well. For example, Honeycrisp apples have a price four to five times higher than other apples in the fresh market because they are in high demand and few growers want to deal with the difficulties of growing them (Jim Lott, personal communication, 2011). On the other end of the spectrum is the York Imperial, a variety that is primarily used for processing because it lends well to cooking (Scott Briggs, personal communication, 2011).

Jim is a commercial wholesale grower, and as a 50/50 owner of Rice Foods and a member of the Board of Directors, he sells between sixty and seventy percent of his apples to Rice for the fresh market. While prices are generally higher in the fresh market than the processing market, prices tend to fluctuate more in the fresh market.

... We are in a commodity business...it's strictly supply and demand. It's not like I'm producing iPhones or iPads, everyone's got apples. It's like cotton, like corn, like

anything else. It's also unlike wheat, or milk or something; when it snows outside, people don't run to the store to buy apples, they run and buy milk and bread. It's not a staple- it's almost like a luxury item; you buy apples if you can (Lott, 2011, p. 18).

Apples sold on the fresh market are often referred to as dessert apples. Because they are going to be sold whole for direct consumption, dessert apples have to be aesthetically pleasing and of the highest quality: "it has to be a quality product to get into Rice's. They're known worldwide for top of the line fresh product.... The consumer is very demanding and discriminating now about the quality of product they want" (Oyler, 2003, p. 3). If a product doesn't make the cut at Rice's based on the quality, they can often be sold to Knouse for processing, which has lower aesthetic requirements.

When apples are sold to Knouse, they arrive in the 25-bushel bins that are used in the orchards. The apples are evaluated by a USDA inspector for size, pressure, and blemishes based on a representative sample of the bin. The bin as a whole is then assigned a grade that determines whether apples will be used for juice, canning, or processing. The grade also determines the price the grower receives. In the beginning of the season, the Board of Directors at Knouse get together to set prices that will be competitive for different combinations of apple varieties, grades and sizes (Scott Briggs, personal communication, 2011).

Once apples are graded, they are processed into a variety of different products based on what Knouse's clients require. They operate four divisions: retail, foodservice, industrial-ingredients, and co-packing. This means that some products are produced for their specific labels, such as Musselman's, while others are produced for generic brands or for foodservice operators such as SYSCO. Co-packing is done to keep the machinery at the plants and the labor working all the year round: for example, Arizona Iced Tea is bottled at the Peach Glenn plant when apple juice and cider isn't being produced (Scott Briggs, personal communication, 2011).

Apples that aren't used immediately in processing are placed in controlled atmospheric storage (CA), an innovation that has meant major changes for the packing and processing industries. While CA has been utilized in different forms since the beginning of the twentieth century, it became increasingly popular and widely used in the 1960s (Washington Apple Commission, 2007). CA essentially "puts the apple to sleep" by controlling temperature and available oxygen so the apples can no longer respire: "they lower the oxygen and increase the carbon dioxide so the respiration rate of the apples will be slowed down. They will pull some of the ethylene out of the air, which is a natural ripening gas that is emitted by most fruits and vegetables" (Oyler, 2003, p. 3). This innovation allows companies like Knouse to keep the best apples in storage and take them out on an as-needed basis to make premium products for customers. The highest quality apples are stored to avoid wasting energy storing low-quality apples. By taking them out only when they're ready to be used, processors can ensure that the products they process will be sold immediately. Before CA was implemented, Knouse would process the apples and keep goods in inventory, using marketing and advertising in hopes of selling what they had in stock. It also allowed Knouse to hire more year-round employees because due to a constant, year-round supply of apples from storage. These employees are generally more skilled and reliable, which further increases the company's productivity (Scott Briggs, personal communication, 2011).

Three Springs Fruit Farm started off growing their apples primarily for the processing industry and sold them to Knouse. Now they sell some to Rice in bulk to be sorted and packed. However, the Wenks are trying to get out of selling their apples to processors. Now they sell their fresh apples and other products, like apple butter and apple cider, primarily through direct-to-consumer markets. They don't have a farm stand this year, but Ben says they have their

first “buying club,” which is similar to a community supported agriculture (CSA) option. Some apples are sold wholesale to Philadelphia and Washington D.C., and customers come directly to the farm to buy wholesale. The farm also participates in seven farmers markets a week, with two trucks going to Baltimore, DC, and a Sunday market in Philadelphia.

Ben sets the apple prices at the beginning of the season and doesn't change them for the remainder of the season. “Honestly, I don't do a lot of price comparing. I come up with something that I think is fair and I sometimes plan somewhat aggressively on price. I never raise prices in the middle of the season and I get in trouble with other vendors.” This spring, Ben started at \$1.99, but with the industry's short crop and lower quality apples, his prices are now the lowest in the market down in DC. He refuses to raise price regardless- it's more important to establish goodwill with customers than get an extra quarter a pound because demand is high (Ben Wenk, personal communication, 2011).

This is possible for Three Springs Fruit Farm based on its Food Alliance certification status, as this is a rarity in the Northeast and Mid-Atlantic for apple growers. Many researchers have assessed willingness to pay for non-conventionally grown products, with varied results: “disagreement remains over whether eco-labels increase consumers' willingness to pay (WTP) for a particular product” (Loureiro et al., 2001, p. 405). A 1999 study found “substantial consumer demand for eco-labeled apples. Over half of respondents were found to be willing to try ecolabeled apples for the first time. Purchase probability decreases as the price premium increases, but even with a premium of \$.40, over 40 percent would still buy” (Blend and van Ravenswaay, 1999, p. 1076). However, when consumers were asked to choose between organic, eco-labeled, and regular apples, the eco-labeled product was less attractive to consumers than the organic products based on considerations of food safety, the environment, and children's needs

(Loureiro et al., 2001). Additionally, a study on organic milk and apple consumption in Vermont found that apple farmers and retailers were able to charge a price premium for organic apples without decreasing their sales (Wang and Sun, 2003).

Niche markets for organic and eco-labeled apples are important for farmers not growing subsidized commodity crops like corn, wheat, or soybeans. United States agricultural policy as determined by the Farm Bill provides subsidies to large commodity growers while “the vast majority of farmers do not benefit from federal farm subsidy programs. Small commodity farmers qualify for a mere pittance, while producers of meat, fruits, and vegetables are almost completely left out of the subsidy game” (Environmental Working Group, 2011). Ensuring price stability for agricultural commodities can be very difficult for farmers who don’t receive subsidies that ensure a minimum unit price. Between 1980 and 2008, prices for fresh use of apples in Pennsylvania increased from 0.129 to 0.277 dollars per pound. For the same time period, prices for processed apples increased from 88 dollars per ton to 245 per ton (USDA Economic Research Service, 2010). For apples going for processing, a price of 245 dollars per ton translates to roughly 0.1225 dollars per pound, which is lower than is fetched by fresh apples. These prices are determined by the market mechanism of supply and demand and in reality these trends represent fairly minimal increases of which only a portion actually goes to the grower. While the price of apples has gone up, the processing and packing plants and the supermarkets benefit disproportionately. “Grocery stores spend about thirty cents a pound and you see [apples] in the store for \$0.99 per pound,” but for Jim prices went from \$9.25 a bushel to \$10 in fifteen years. Jim says this is “not enough... It’s the same price as it was in 1996” (Lott, 2003, p. 5).

This leaves farmers and orchardists in Adams County more susceptible to bad fruit crops and resulting price fluctuations and crop losses. This was a major problem for growers during the

2011 apple season.

On a scale of one to ten, one representing a bad year for apples and ten representing a good one, Ben rated the 2011 season a three: “the weather was so horrible we couldn’t get a lot of spring work done because we were behind.” As if a dry summer and three separate hailstorms weren’t enough, a hurricane came and knocked a bunch of apples out and an earthquake kept Ben from two markets. There was snow in October and a ridiculous amount of rain that led to higher disease. Ben says he can only remember one year that was worse for apples than this one: 1992, when he was nine years old (Ben Wenk, personal communication, 2011). Jim held a similar position:

This has been a rough year, this year. We’ve had three feet more water than normal and I’ve had a tremendous amount of disease trouble here. We had an apple scat problem here; it’s a fungus problem because of the wet weather. We just went from a fresh pack to a processing pack, which costs money. ... I ended up with 60 percent of our crop and most of that was garbage because of the rain and the apple scat...I had a gorgeous Honeycrisp crop. We pick it four times- we got it over once and then we had Hurricane Irene and that ruined the crop (Lott, 2011, p. 11).

USApple opposes the current structure of the agricultural subsidy system and the situation it imposes on apple growers. The apple industry has lobbied the government to maintain specialty crop provisions previously included in the Market Access Program (MAP) of the 2008 Farm Bill. MAP provides government funding for things such as research, Specialty Crop Block Grants for marketing, food safety or nutrition initiatives, and disaster assistance, to name a few. MAP also provided assistance through the Technical Assistance for Specialty Crop (TASC) program which was, “key to leveling the playing field in the export market where the apple industry competes with lower cost producers” (USApple, 2011). USApple also encouraged the government to support pending Free Trade Agreements with Colombia and Panama to

achieve “meaningful increased market access” (USApple, 2011). International trade and global competition for the apple industry has become a major issue in recent years. In November of 2005, the USDA Horticultural and Tropical Products Division published an “Apple Update” stating that while US apple exports were making a comeback, global pressure on the industry remained an issue. One issue was increased availability of apple substitutes to US consumers through imports of tropical fruit like mangoes from Central and South America (USDA Horticultural and Tropical Products Division, 2005). However, in terms of global competition, China emerged as the biggest threat to the United States.

In the 2008-2009 crop year China produced over 50 percent of the world’s apples and \ exported 54 million bushels. The U.S. exported only 40 million bushels that same year. Encouragement from the Chinese government significantly increased its capacity to produce and market products such as apples: beginning in 2005, the central government began providing subsidies to certain apple growing regions and most provincial and local governments provide additional subsidies to apple producers (Zhang et al., 2010, p. 44). When the Chinese government requested access to the US fresh apple market, USApple and many growers were in opposition. It was believed that this could potentially “displace a significant quantity of American apple production, jeopardizing the economic viability of U.S. apple growers” (USApple, 2011). The Apple Update of 2005 had previously determined that the United States was slowly losing market share to China, which aggressively sought out new markets for their apples (USDA Horticultural and Tropical Products Division).

Jim disgruntledly explained, “as far as international trade, China is our biggest problem. It might have been 15 years ago now, they threw a whole bunch of apples in the ground and about 10 years ago they started producing a tremendous amount of volume. And 5 years ago it

was astronomical and they didn't know what to do with the apples. So what they're doing is processing them into juice and sending the juice over here for almost nothing" (Lott, 2011, p.18). This policy of China's was hurting growers and processors who were unable to compete with the low prices of Chinese juice and fresh apple exports. At the time, court cases came up to impose anti-dumping regulations against China, but this has become less of a problem over the years. A rise in China's GDP and standard of living has increased domestic consumption of the excessive Chinese apple crop. Many growers and government officials alike were concerned about importing Chinese pests and diseases (USApple, 2011).

Not only did China actively pursue trade with the European Union by attempting to meet their standards, but it also signed a trade agreement with Mexico. This presented a major problem for the U.S. apple industry after Mexico's government announced an initial anti-dumping duty of roughly 45 percent on Red and Golden Delicious apples from any and all companies associated with the Northwest Fruit Exporters (NFE) in September 2005. This duty extended a previous one imposed on apple exporters not associated with NFE in August of 2002 (USDA Horticultural and Tropical Products Division, 2005).

Further issues arose in March 2009 when the United States terminated the US-Mexico Cross Border Trucking Pilot Program. Mexico retaliated by imposing import tariffs on US goods in August 2009, including a 20 percent import tariff on fresh and dried apples. Given that Mexico is the largest export market for US apples, this was a serious concern for the apple industry. Industry representatives voiced concerns to President Obama that if negotiations didn't resolve the dispute immediately, Chile could increase exports to Mexico through duty-free access to their markets, destroying hard-earned increases in US apple exports to Mexico achieved in the five years prior to the tariffs (Foster, 2010). The President and CEO of USApple

sent a letter to President Obama with a plea to resolve the issue: “American apple growers respectfully urge you to restore their opportunity to sell apples freely into Mexico and sustain jobs” (2010).

The irony in this statement can be understood best by examining another plea from an American apple grower to the United States government in regards to agricultural labor reform. Phil Glaize of Glaize Orchards in Winchester, VA testified before the U.S. House of Representatives Subcommittee on Immigration, Refugees, and Border Security in September 2010 urging them to, “save our farms, save US jobs, save our rural communities and economies, save our American food supply.” Phil Glaize was lobbying in favor of the AgJOBS bill, “a proposed immigration law that would provide agricultural employers with a stable, legal labor force while protecting farmworkers from exploitative working conditions” (Farmworker Justice Bulletin, 2009). Farmworkers, both undocumented and agricultural guestworkers, would be able to obtain temporary immigration status and potential permanent resident status under certain conditions. If enacted, AgJOBS would revise the H-2A temporary foreign agricultural worker program (Farmworker Justice Bulletin, 2009).

Proposed legislation for immigration reform has long been an important issue for farmers and industries reliant on migrant labor. The apple industry is one such industry, as can be seen in the change in the labor force in Adams County over generations. The widespread use of migrant labor in Adams County began in the mid-twentieth century, marking a shift from the prior use of local labor (Adams County Fruitbelt, 2009). In the early eighteenth century until just prior the First World War, most commercial apple growers paid other farmers who made little income on their own farms to work during harvest season. During World War I, the labor force shifted to high school students who were locally available and provided cheap labor. “But it was only with

the Second World War and the transformations following on it that migrant labor became critical”: a lack of American workers caused a major shift in the local labor force to primarily Southern African American and Puerto Rican workers (Adams County Fruitbelt, 2009, p. 970). Sources note migrant workers from the Caribbean immediately after, primarily from Haiti, Jamaica and the Bahamas. Not long after, Mexican workers were noted for the first time, and the increasing number of undocumented workers was addressed by a 1963 federal law imposing sanctions on their employers. This law achieved essentially nothing, and today the vast majority of agricultural laborers in Adams County are migrant workers of Mexican descent (Adams County Fruitbelt, 2009, p. 971). Other South and Central American workers are also represented, most notably those of Guatemalan descent (Lott, 2011, p. 19).

Labor is an integral component of the apple industry’s success. Unlike other tree fruits that can be picked by mechanical harvesters, such as tart cherries, apples need to be handpicked so they don’t bruise (Jim Lott, personal communication, 2011).

Jim uses a migrant work force to harvest peaches and apples at Bonnie Brae. Jim hires a federally licensed farm labor contractor, often incorrectly referred to as a foreman, to bring in skilled agricultural labor for the harvest season. Rico, or Carlos Enrique Fernandez Jr., is the current farm laborer contractor at Bonnie Brae. His father, Carlos Fernandez Sr., was the farm labor contractor who worked for both Jim and his father Mac until Carlos’ death in 2010. Rico, often incorrectly referred to as foreman, is jointly responsible with the grower for issues associated with hiring undocumented workers, worker mistreatment and other related accountability issues.

Jim speaks highly of the migrant labor force he employs:

...I think this workforce we get here, of course the people Rico brings, are great. Generally speaking I’ve not had a bad experience with them. They want to work. I mean

that's what they are here for. They want to earn money ...and we have a good group over here that have been here for quite a while. Rico's dad ...started in 1971 and that's a long history of bringing people up here and some people have been here for 15 or 20 years, they keep coming back and that's nice. They've got a great work ethic I wish we had more (Lott, 2011, p. 20).

A year-round work force of fifteen mostly white workers is also employed at Bonnie Brae. Jim has offered them picking jobs. "I've told them, we don't have enough people, do they wanna pick? And they kinda laugh; they wouldn't do it... there is a small percentage of people that would actually do that kind of physical labor every day. It's not easy, it's skilled" (Lott, 2011, 21).

Three Springs Fruit Farm also has a significant percentage of workers that are Latino. Of the twelve year-round workers employed on the farm, eight or so are Latino. "With the labor demand curve in fruit, there is one huge bump followed by a second smaller bump for pruning. We want to smooth that curve out." At the peak of apple season, Ben has about 30 workers on payroll. "We're very lucky to have a lot of returning workers. A lot of them are friends and family of already hired workers... we have guys that have been with us for twenty years." At Three Springs, a returning worker who can do almost every job on the farm gets paid more accordingly; workers are given more responsibility all the time. Wages are often negotiated with the crews depending on the work being done. When it's time to prune the trees, workers are paid around \$7.50 per tree. Even these wages are negotiated: the bigger the tree the higher the rate (Ben Wenk, personal communication, 2011).

Both Jim and Ben recruit workers through hired labor contractors rather than through H-2A. The program has been widely criticized for being too bureaucratic and impossible to work with, and as such most growers try to avoid it. Also notable is the stance of the Agriculture Coalition for Immigration Reform (ACIR), a coalition of groups that represent labor-intensive agriculture. ACIR has denounced specific aspects of the H-2A program and announced support

for AgJOBS legislation, a proposed alternative to H-2A. As a long-term participant in ACIR, USApple has also taken an official stance in opposition to the program due to “increased costs, threats of lawsuits, and general inefficiencies in the program” reported by the trade association’s growers (Kurrle, 2009, p.1).

However, issues associated with undocumented workers are an issue for the growers and thus the industry as a whole. The prevalence of anti-immigrant sentiment in many regions of the United States paired with the politicized nature of immigration and border control have polarized the country on issues of immigration reform. Nativist sentiment stemming from perceptions that illegal immigrants are responsible for unemployment of Americans, higher crime rates, and other social ills have spurred reactions ranging from anti-immigrant rallies to murderous hate crimes. This anti-immigrant sentiment impacts the apple industry and other labor-intensive agricultural sectors in a myriad of ways. Most notable is the imminent fear that the labor force apple growers in Adams County rely on to harvest apples will disappear.

...“There are a lot of bills pending here, in this state now, about illegal immigrant and hiring illegal and so forth and verifying their status and all that. That is to me the biggest risk to the business, it’s worse than weather, it’s worse than food safety, and pesticide regulations...it can be an immediate end to the business” (Lott, 2011, p. 25).

John Rice, the Vice President of Rice Fruit Company, shares this fear with Jim and all the other producers, pickers, and workers associated with the Adams County apple industry. In a written testimony for the hearings on the “National Security Begins at Home” Legislative Package, John writes on behalf of the famers and pickers alike:

...We do not need laws that would punish honest fruit growers for hiring the only workers that are available to harvest their crops. We do not need laws that would treat these workers as criminals to be identified, jailed, and deported...we need laws that would create a guest worker program here so that these people could come here legally and do the jobs that no one else wants. They don't need to be given American citizenship, even though most of these workers have been paying American taxes for years. They should

be granted renewable work visas. They should be brought out from the shadow economy and treated with respect (2011).

John also warns of the potentially catastrophic effects of the proposed legislation on an entire industry and livelihood:

...I hope that you will decide that every one of the bills that you are considering at these hearings would be against the interests of the Commonwealth. I hope you do not make the mistake of trying to create a legal wall to keep out some of the Commonwealth's most valuable and least appreciated workers. If you are successful in barring these workers from Pennsylvania, then I am afraid that you will be successful in shutting down every family fruit farm in Pennsylvania (2011).

Conclusions

Globalization and international competition in agricultural commodity markets, along with lack of appropriate government support, means that the apple growers of Adams County struggle to lower production costs while consistently providing a high-quality product for the competitive market. American consumers no longer remember the natural, blemished state of fruit or the small family orchards that flourished across the country. Instead, consumers have become accustomed to the lustrous red strains of apples that evolved as the product of competition between Northeast and West Coast producers “setting the standards for ‘pretty’ apples in new and larger supermarkets” (Yoder, 2008, p. 86). We now demand these beautiful, shiny red apples, caught on the same path of temptation that led Eve and Snow White down precarious paths. And so the American apple industry finds itself on an increasingly unknown and unstable path as well. By losing sight of the roots of the original apple tree, we have lost a sense of our own roots as well. The apple is a non-native species of fruit that was brought to the shores of America, only to develop into thousands of individual varieties with different strengths and weaknesses. Some grew wild and pioneered westwards, while others were lovingly tended to

and cultivated until they grew into the unique varieties of apple beloved by all. In many ways, the apple embodies ideals and values associated with the positive aspects of the United States.

Yet the true irony of the situation is that a strong nativist sentiment prevails in many areas of the country that rely on migrant agricultural workers to keep industries and economies functioning. To demand that a non-native fruit be grown and provided at a low cost while simultaneously refusing to have “non-native” people doing this grueling work is nonsensical. Public discourse simultaneously refers to national security as “securing America’s borders” and as the ability to produce our own food. The harsh reality is that globalization has rendered both of these things impossible. A globalized industrial agriculture system means that America cannot produce its own food without the help of a massive migrant labor workforce that comes, in the case of apples, primarily from Mexico. Likewise, a global exchange of culture and ideas has redefined borders and changed what it means to be American, Hispanic, Latin@, or “white.”

Americans must ultimately acknowledge these changes and come to grips with the globalized nature of modern societies. Americans must recognize that the hands of migrant laborers from Mexico pick the apples in Adams County, Pennsylvania that are baked in pies and eaten across the country at Thanksgiving. We must look beyond images and concepts society has come to associate with apples that are stereotypically “American” and are closely linked to patriotism and white, middle class life: these images hide the real face of the American apple, and that is the face of migrant labor. Embedded in Thoreau’s assertion that strong parallels can be drawn between the history of man and the history of the apple is the recollection of the Sour Crab apple, the native species of North America. Just like we never speak of the reality of the indigenous apple, we rarely acknowledge the indigenous race of North America, similarly evolved into thousands of unique yet equally beautiful varieties.

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- Angélica Hernandez, migrant worker at Bonnie Brae Orchards. Bonnie Brae Camp, York Springs, PA. 19 October 2011.
- Carlos Enrique "Rico" Fernandez, Jr. Farm labor contractor for Jim Lott. Bonnie Brae Camp, York Springs, PA. 27 October 2011.
- Ben Wenk, Grower and Marketer for Three Springs Fruit Farm in Aspers, PA. Farmers on the Square Carlisle farmers' market, The Depot at Dickinson College. 09 November 2011.
- Scott Briggs, Vice President of Human Resources & Communications at Knouse Foods, Inc. Knouse Food Peach Glen Plant and Corporate Offices, Peach Glen, PA. 17 November 2011.
- Jim Lott, current owner of Bonnie Brae Orchards. Jim's office in York Springs, PA. 17 November 2011.

Appendix A: Field Note Reflections

The fieldwork practicum was an incredible experience for me as a senior in college and as an Environmental Studies major who has taken few outside classes since declaring. Throughout my freshman and sophomore years, I was a Spanish student and loved the language, eventually leading me to study abroad in Costa Rica. However, throughout my time at Dickinson I have barely hit the tip of the iceberg in terms of Latin American history and culture, and have certainly never thought extensively about the role of Latin@s in the United States. Considering that I hope to focus on sustainable agriculture as an Environmental Studies major, this course has been instrumental in forcing me to think of sustainability beyond soils and chemical use and think about the human aspect.

This course truly opened my eyes to many realities that I was unaware of or knew little about, not only in terms of immigration and the lives of Mexican migrant workers. Thinking about the role of ethnographic research and how researchers impact the societies and communities they study was very relevant to my life as a graduating senior applying for a Fulbright to do research abroad. This course helped me understand the implications of doing research and opened my eyes to both opportunities and ethical considerations.

One of my regrets about the course was that I did not push myself hard enough to practice my Spanish skills and interact with the workers on a level that would give me true insight to their lives. However, the few interactions I had with the workers at Bonnie Brae enriched my experience in the Mosaic. I also wish I could have taken more courses in the Mosaic rather than just the fieldwork practicum, but I feel lucky to have been able to participate at all. I look forward to doing more work and reading on my own regarding immigration and migrant farmworkers' status in the United States as I follow a career path likely linked to agriculture.

In terms of the class itself, something that I struggled with was the heavy load of reading in the beginning of the semester before feeling a strong connection to the topic. While the initial reading is important for understanding the historical and current context of the issues before jumping into fieldwork and interactions with the workers, I felt like by the time I started going out into the field the workers were about to leave for the season and I had barely gotten comfortable enough to speak with them. I think it might be helpful to start earlier in the semester with the trips to the field, even if field notes and research have not yet begun, just to get students comfortable and invested in the subject. Then the subsequent readings feel more relevant and are conceptually easier to relate.

I think the major strength of the practicum was the cooperation between the professors and the students. Not only did the professors provide all of us with incredibly valuable connections, ideas, and resources, but so did our fellow classmates. Whether people were sending articles they thought were relevant or conducting joint interviews, the collaboration and teamwork made the topics easier to tackle and less daunting. There was also an infectious passion for talking about our experiences that made the class much more enjoyable. This was especially apparent during our peer reviews and presentations when people could barely contain themselves from interrupting and sharing their own related experiences and opinions. I thought this contributed a great atmosphere to the class that made the projects less stressful, more complex and rich, and more enjoyable to undertake.

Overall, my experience with fieldwork this semester has demonstrated the importance of self-awareness as a researcher and examining various viewpoints to see the broader picture. I see the value in pushing myself out of my comfort zone to ask questions that I want answered or to access perspectives I've never experienced before. I truly feel as though this course and the work

that has come out of it has not only sparked my interest in an entirely new vein of agricultural studies, but has given me a new perspective on research and exploring uncomfortable, contentious topics that are often hidden in the shadows.

Thank you Professor Rose and Professor Borges for a fabulous semester and a truly rich learning experience. I hope you've enjoyed it as much as I have, and I look forward to working with you in the future as well!