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**The Agricultural Organic Food Market in United States:  
Emphasis on California**

**I. Introduction**

California has always been a principal state for agriculture in the United States, so it comes as no surprise that it has also been a driving force in the organic foods sector of the market. Although the organic sector of the market accounts for less than 1% of the overall produce market in the United States it is rapidly growing. The process to achieving legal recognition has been long and is still incomplete. From an economics perspective this leaves open the question of the desirability of a defined organic market. Between 1991 and 1995 certified farm acreage almost doubled at a period of time when the total number of farm acres was declining in the United States (Klonsky and Tourte 1121). California in particular felt this growth. California has significantly more organic farms any other state with close to 50% of the total organic farms located in the state (Guthman, "Agrarian Dreams" 38; Guthman, "Regulating Meaning" 136). The organic market has grown approximately 20% each year since 1989 with no decline in sight (Guthman, "Regulating Meaning" 136).

The origins of these products extend back to the mid-nineteen hundreds, but there has only been considerable legislation concerning organic foods in the

last couple of decades. The first notions of organic foods came from the writings of Sir Albert Howard and Lady Eve Balfour in the 1940's. They promoted the idea that the health of plants, soil, livestock, and people were dependant on each other. From this basis they developed the idea that the processes should work together, not against one another. Farming methods should work in accord with nature using inputs produced on the farm (Klonsky and Tourte 1119). At this time period legislation from the New Deal passed by President Roosevelt in attempt to combat the Great Depression and later reforms had created a highly regulated agricultural system with many price supports to deal with over-supply along with many production controls. The noble ideas of Sir Albert Howard and Lady Balfour had to compete with a policy that inevitably promoted monocropping and large uses of production inputs to maximize yields per acre. On top of this, the technologies to create DDT, a colorless insecticide that is toxic to humans and animals, were being developed and it began to be put to widespread use for immediate pest control along with other harmful pesticides and fertilizers. Basically, the land was severely over-utilized in order to keep up in the economy (Guthman, "Agrarian Dreams" 13, 15, 52-53). Due to the current trends in agriculture the idea of organic was largely dismissed and gained no popularity.

It wasn't until the late sixties that anyone became serious about organic farming. The first people to practice organic farming had no interest in solving the mounting problems of conventional agriculture including soil erosion, depletion of nutrition, toxic run-off, and human health (Guthman, "Agrarian

Dreams” 11). These farmers were mostly interested in organic foods because they saw it as an “explicit antidote to the excesses of industrial agriculture” (Guthman, “Agrarian Dreams” 8). They were small-scale farmers that were interested in making radical political statements. They liked organic foods for the simple reason that they are outside the realm of the conventional system. For this reason organic initially received a negative connotation for its radical ideals (Guthman, “Agrarian Dreams” 119).

In 1973 the California Certified Organic Farmers (CCOF) was founded. This was the first organization that attempted to create a systematic application of standards in order to create a method of enforcing the quality of organic products (Guthman, “Agrarian Dreams” 120). After criticism from the media in the early 1970’s which portrayed organic foods as “unappealing if it had bugs on it and denounced as fraudulent if it was bug-free”, members of the CCOF began to desire legal recognition of organic products in order to differentiate their products in an obvious way and to protect the consumer from false or misleading information (Guthman, “Agrarian Dreams” 119,121). The first attempts to pass legislature began in 1971 but the first successful bill in California was not until the Organic Food Act of 1979. It legally defined the term “organic” but explicitly avoided responsibility for enforcement of this description. After an embarrassing scandal revealed the lack of enforcement on the part of the California government combined with the persistence of the CCOF the California Organic Foods Act of 1990 (COFA) was passed. This new law provided a legal definition of organic as well as a list of appropriate and inappropriate inputs for

organic production and a means to enforce this policy (Guthman, “Agrarian Dreams” 121-123).

The year 1990 is also when the first significant legislative act was passed at the national level. National Policies unavoidably affect California legislature since state laws must comply with federal ones. The Federal government was even more hesitant to pass organic legislation largely due to the image of organic advocates as endorsing a system that was “primitive, backward, nonproductive, unscientific, technology suitable only for the nostalgic and disaffected back-to-landers of the 1970’s” (Youngberg quoted in Guthman, “Agrarian Dreams” 124). For this reason there was a large discussion of alternative terms that were essentially synonyms for “organic” such as natural, sustainable, or low-input crops. There was also debate regarding the efficiency of a national standard. From one point of view a single national standard would lower the costs of obtaining information about the labeling to consumers, therefore positively affecting their purchasing decision. Growers are then also protected from fraudulent producers exploiting the title "organic" for profit. On the other hand a single standard across an area as large as the United States limits the options of organic farmers and does not allow for diversity of geography (Krissoff 1132).

The first progress at the Federal level was a report done by the United States Department of Agriculture (USDA) in 1980 on organic farming that was eventually followed by the Innovative Farming Act of 1982. The idea of this act was to encourage scientific research into the areas of organic farming without directly using that terminology. In 1985 the concept of sustainable agriculture

was incorporated into the farm bill within a program titled the Low-Input Sustainable Agriculture Program or LISA. This furthered the investigation into alternative farming methods. Finally in the 1990 farm bill the Organic Foods Protection Act (OFPA) was introduced. This bill with considerable revisions is the policy that is still in effect today (Guthman, “Agrarian Dreams” 123-125).

The Organic Foods Production Act set up the National Organic Standards Board (NOSB) to write and enforce standards for the production of organic products. It also established a national list of acceptable and un-acceptable inputs for organic products. This Act allowed for State Organic programs (SOP) as long as the requirements of the state met or exceeded the national standards. If the requirements were met products were allowed to exhibit the USDA organic symbol (7 USC 6505, 6517-6518). This act was passed in 1990, but due to a great deal of controversy regarding definitions, it was not until the year 2000 that the Final Rule was confirmed. There were over 280,000 comments posted on the Federal Register regarding this policy, more than had ever been witnessed for a single piece of legislature in the past. The Final Rule finally went into enforcement in 2002 (Guthman, “Agrarian Dreams” 127, 381).

The concept of the Final Rule is to create “a production system that is managed in accordance with the Act and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity” (7 CFR 205). While this sounds like an admirable undertaking, it essentially becomes a list of production inputs that are allowed or

not allowed. There are four different organic distinctions outlined: one hundred percent organic, organic, made with organic ingredients, or you may advertise certain organic ingredients your product may have. Each level comes with mandated levels of organic inputs and appropriate labeling that must be used (7 CFR 205).

Since the Organic Foods Protection Act allowed for State Organic Programs and California already had an existing program the California legislature was only slightly modified in order to comply with the national standards and California has maintained their own organic certifying program. The CCOF became an official certifying agency in California to enforce these standards. The most current legislature is the California Organic Products Act of 2003. One notable difference in California from national policy is that all organic farmers are required to register with the state regardless of whether they are certified organic growers or not. This mostly applies to very small operations that either do not need to (if they are under \$5,000 annual sales) or choose not to become certified and they are not eligible to display the USDA symbol (California Department of Food and Agriculture).

The organic foods market initially started as a radical political statement against conventional methods of agriculture, but has become an important candidate for sustainable food production after large externalities of conventional methods were discovered. This brings us back to the question of the desirability of a defined organic market from an economic perspective. Are organic goods an economically efficient product based on a cost-benefit

analysis? When considering the effects of factors such as crop yields, production costs, policy enforcement costs, environmental impacts, and implications for an individual's health are organic markets beneficial? Despite economic efficiency issues there is undoubtedly a supply and demand for these products. I will explore what factors affect the supply and demand of the produce section of this market in particular, along with the circumstances that allow organic and conventional markets to co-exist. Finally I will discuss the policy implications my research suggests in order to improve social welfare and evaluate the existing legislature from an economic standpoint.

## **II. Are Organic Products a Cost Effective Solution to Conventional Products?**

If organic products are to be considered as a solution to conventional agriculture then the benefits received from organic foods must outweigh the costs associated with them. Such benefits in this analysis are the reduction in damage to the environment and human health along with a larger probability to sustaining this type of agriculture in the long run. With these benefits come certain costs such as lower crop yields per acre as compared to conventional agriculture, policy enforcement costs to regulate organic labeling, and the costs of production, which may or may not be higher than that of conventional agriculture. In many conducted studies only one of these factors was considered at a time which makes it difficult to draw a conclusive decision as to whether or

not organic products add a benefit larger than the costs incurred for growing them.

Attempting to decide if organic products are cost effective is a difficult task, not only because there are many variables to consider, but also because many of the variables are difficult to measure in monetary units. The cost of pesticides to the environment and health are difficult to quantify. Organic farming has certainly proven to be profitable. Price premiums have succeeded in making organic farming at least as, if not more profitable than conventional techniques. There exists a sophisticated urban market that is willing to pay a high price for organic foods, which they consider a vanity product regardless of the actual price of producing it (Guthman, "Regulating Meaning" 140). There is some evidence that even without price premiums organic farming is more profitable than conventional farming due to higher yields during dry periods, lower input costs and crop mix (Dimitri and Green 4). Just because organic farming is profitable does not mean that it is a cost-effective practice. Many studies looking at input costs, income, profitability, and other economic characteristics have yielded mixed results (Dimitri and Green 3).

Most literature in this area seeks to find an optimal level of synthetic chemical use considering other relevant variables. An econometric model fashioned in this way implies that there is an optimal level of pesticide or herbicide use that exists that is greater than zero, which would constitute a non-organic product. A study by Fernandez-Carnejo and Pho recognizes that a farmer will substitute toward herbicide use for pest management if the price of

herbicides drops relative to the price of labor, which is the standard input for pest control in organic farming (38). Decisions based on this type of logic would yield an efficient solution from an economic standpoint. The problem with this model is that important variables such as environmental variables, chemical resistance, and multiple-pest species to be controlled at one time are not included. Davis and Tisdell recognize this face in their study and attempt to consider these variables and find an efficient threshold at which to apply pesticides, the most common practical application of an integrated pest management (IPM) system (66).

IPM was developed by entomologists who were concerned with the larger affects of chemical uses in agriculture on workers, consumers, fish and wildlife, and the agricultural ecosystem itself from pest resistance (Hall and Moffitt 4). They knew that farmers would make their decisions to use chemicals based on economic factors so they sought to create a system that incorporated biological and chemical controls to maximize economics benefits. By strategically checking the pest population periodically they are able to give advice as to when and how much chemicals to administer. In this way farmers can maximize results from a minimum amount of chemicals and avoid the cycle of a total spray, followed by a secondary outbreak since pests reproduce very fast, which leads to the necessity for more pesticide application when the farmer cannot wait for natural enemies to take care of the new pests, all the while the pests are gaining resistance to the pesticides (Hall and Moffitt 5).

Research entomologists claim that advancement of the IPM strategies could result in increased yields, reduce pesticide applications and therefore costs, and slow the rate of pest resistance (Hall and Moffitt 4). Decreasing the use of pesticides would also mean less possibility of contamination, addressing health concerns. There is a large amount of concern about pesticide use because they are an environmental contaminant that is “unique among intentionally introduced environmental contaminants in that they are specifically designed to be injurious to living organisms” (Hall and Moffitt 6). They introduce a risk from possible residues on products, but also from impacts on the wildlife and the environment, especially the water supply since if it is contaminated it leads back to human consumption issues (Hall and Moffitt 5).

From an economic standpoint it is important to remember that every decision involves trade-offs. In the pursuit of considering the efficiency of organic goods, you may also view the issue from the opposite approach. Since “organic agriculture” is essentially how all food was produced before the invention of pesticides and herbicides, we can consider the costs and benefits that introducing synthetic chemicals incurred. When they were first introduced all the costs were not necessarily known, but they have become much clearer in recent times. At this point we can use this information to make an educated decision as to the desirability of getting rid of all synthetic chemicals to return to how it was in the “good old days”. This is essentially the same question as figuring out if organic agriculture is currently cost-efficient.

To recognize the good synthetic chemicals have brought to agriculture it is necessary to return to the early 1800's. At point in time a British economist, Thomas Malthus, predicted that there would be widespread famine due to a lack of food supply. He started his argument by assuming that people would continue to reproduce and that food is necessary for people to survive. From these two assumptions he argued that the population would continue to grow exponentially whereas the food supply would only increase in a linear fashion. This means the population would become limited by the food supply, leading to a situation in which death must occur from starvation, reducing the population to a level which the food supply can support and restarting the cycle. This argument seems very credible, so why wasn't this phenomenon witnessed? The answer to a large extent is because of technological advancement. There was a shift away from organic agriculture after World War II, increasing the use of chemical fertilizers, pesticides, and herbicides. This along with newly invented agricultural machinery, and genetic improvements of crops allowed greater production for less labor. These advancements have not only avoided the predicted famine of Malthus, but have actually lowered the price of food in real dollars. People are spending less of their income on food and spending less time providing it. This means that due to the technological revolution, mainly the evolution of synthetic chemicals, food is readily available at reasonable prices at the local supermarket (Gallagher and Allred 128-131).

Obviously these innovations come at a cost, but we must always be careful to consider if these costs are large enough to outweigh the benefits, only

then making a policy undesirable. There is obviously a risk to health if synthetic chemicals are consumed, but scientific data has shown that this is not a significant risk (Gallagher and Allred 132). With responsible application of chemicals, potential hazards to the wildlife and environment can be minimized. A complete return to organic agriculture could have a devastating effect on the food supply. From my analysis an IPM strategy seems to be the most economically efficient method of agriculture. It balances the potential costs of synthetic chemicals to ensure that the benefits are larger. This statement is not undebatable and further research may show otherwise, but from my understanding of the issue this seems to be the most practical farming technique to implement to maximize the cost-benefit ratio. Organic production does not seem to be a practical solution for the entire economy to ensure sustainable food production. However, there does exist a demand for organic products that cannot be ignored, which means some level of organic production must be desirable. Next, I will explore where this demand for organic produce originates.

### **III. Demand for Organic Produce**

Although it is hard to establish any concrete and unequivocal conclusion as to whether organic products are economically efficient it is impossible to deny that a demand for them does indeed exist. In the following section I will explore what factors contribute to this demand. From 1991 to 1995 the number of certified organic farms and acres of certified organic land in the United States almost doubled in a time period where the total amount of land devoted to

agriculture was slightly on the decline (Klonsky and Tourte 1121). Since 1989 organic food sales in the United States have consistently grown at a rate of 20% per year with no noticeable increase in demand for conventionally grown products. This rapid growth in the organic sector has been largely initiated by an increase in demand as producers attempt to keep up with supply (Guthman, “Agrarian Dreams” 1,191).

There have been many studies conducted on the demand for organic goods. Most of them rely upon consumers to self-report their preferences and purchasing behavior through surveys and questionnaires (Krissof 1130). Critics debate the reliability of this data. The fact the participation in the survey is voluntary may lead to a biased sample. Picking certain locations for sampling, such as natural food markets, may also provide a biased sample for the simple fact that people who choose to shop at such a store probably have a disposition towards purchasing organic products. Surveys conducted on the statewide or national level are less likely to display these biases and may therefore be more reliable (Thompson 1115). Also as sample size increases incorrect conclusions are less likely to be reached.

Unfortunately, it is very difficult to collect more accurate types of data in the organic market. Due to the types of venues through which the product is sold, there is a large amount of difficulty in collecting actual sales data in this market. These generally include health food supermarkets (such as Whole Foods or Trader Joes) main stream supermarkets, small health food stores or co-ops and direct from producer to consumer methods such as farmer’s markets.

Approximately 65% of organic sales are conducted through direct sales, but as more are being sold through large super-markets scanner data that can be seen as more accurate is becoming more readily available (Krissof 1130). Previous to the invention of price look-up codes retail data for fresh produce was nearly impossible to find, but it is still scarce and not generally collected by scanner data services (Thompson 1113). The increase in the availability of this data may provide more reliable data in the future but it is still in developing phases at this point.

Consumers demand for organic products is a result of their perceived health, nutrition, safety, and quality assurance of these products (Krissof 1130). To portray an accurate description of the demand for organic goods in the United States one must piece together a complex set of independent studies (Thompson 1113). The major published studies since 1990 to 2001 are highlighted in the table below (Dimitri and Greene 7, Thompson 1114):

<b>Study</b>	<b>Year</b>	<b>Survey Method</b>
Byrne et al., Groff et al.	1990	Mail Interviewed entering customers in two Safeway stores
Baker and Crosbie	1992	
Swanson and Lewis	1992	Mail survey of direct market customers
Parkwood Research Associates	1994	Telephone
Thompson and Kidwell	1994	Questionnaire in co-op and natural food supermarket
Reicks, Splett, and Fishman	1996	Customer intercept interviews in upscale and discount supermarkets
Hartman Group	1996	Telephone sample of national panel (250,000) Hedonic Analysis of demand for organic produce. Data collecting using focus groups and mall interviews.
Estes and Smith	1996	
Food Marketing Institute	1997	Stratified random telephone sample
<i>The Packer</i>	1997	Telephone sample of national panel (400,000)

Thompson and Kidwell	1998	Collected data on items purchased by examining shopping carts of consumers in Tucson, AZ, and collected demographic data.
Reicks, Splett, and Fishman	1999	Experimental design for effectiveness of shelf labeling.
Govindasamy and Italia	1999	Estimated consumer willingness to pay a 10% premium for organic produce.
Glaser and Thompson	1999 & 2000	Econometric analysis (using scanner data) of demand for organic frozen vegetables and organic milk.
Hartman Group, the Organic Consumer Profile	2,000	Mail questionnaire sent to 40,000 households, nationwide, selected from a panel of 550,000 households. The panel conforms to a cross-section of the population based on the 2000 census; 26,434 consumers responded.
Walnut Acres Survey	2001	Telephone interviews with nationally representative sample of 1,000 adults.
Food Marketing Institute	2001	Telephone interviews with nationally representative sample of 1,200 adults.
Thompson and Glaser	2001	Econometric analysis (using scanner data) of demand for organic baby foods.
Loureiro and Hine	2001	Estimated the willingness to pay for Colorado potatoes.
Fresh Trends Survey	Biannual	Two separate surveys. The first survey was a telephone survey of 1,000 nationally representative households. Average phone conversation was 10 minutes. The second survey covered 5,000 consumer in-store interviews in June 2001 and August 2001. Interviews took place in one retailer (five stores each) in five different markets across the US.

How consumers value these factors may be influenced by a customer's age, gender, marital status, education, and household size, and income (Thompson 1115-1117). Thompson and Dimitri & Greene provide a thorough summary of the findings of these studies. Income seems to be the most influential factor to demand for organic goods, although there are significant exceptions from households of certain types of individuals that have strong personal ideologies enforcing commitments to organic products. At the national level studies showed

that households with higher incomes were more likely to purchase organic foods (Thompson 1115). This makes sense from the fact that organic foods have managed to establish themselves as a high quality product that can be seen as a status symbol because it demands a high price premium that does not necessarily reflect the cost of growing it. In California especially, there exists a “high wage-labor force, but one that is still influenced by counter-cultural values” who uses organic products as a vanity good (Guthman, “Regulating Meaning” 140). The demand for quality goods is primarily from “privileged, higher income, higher educated, well-traveled professionals increasingly concerned with food quality, safety, and variety” (Friedland qtd. in Guthman, “Agrarian Dreams” 20).

The effect of age on the inclination to purchase organic products is mixed. From the studies completed as of now it seems more likely that certain segments of the population such as “true naturals” and “young recyclers” display higher tendencies for organic goods. These are the groups that identify with the counter-culture ideologies. The average age of these groups happen to correlate with other studies that found higher tendencies to purchase organic goods from the age group 18-29 or under 35 which is the approximate average age of “young recyclers” and between 40-49, also the average age of “true naturals”. The over 60 age group was found least likely to purchase organic goods confirmed by a negative correlation between age and consumers indicating organic food as much better than conventional. The studies make it unclear whether age causes increased tendencies to organic foods or whether there may be an omitted

variable because of the segment of the population the person is coming from (Thompson 1116).

Studies have calculated education as a variable in two different ways: as a continuous variable for number of years of schooling and as a categorical variable (Thompson 1117). Education displayed a slightly unexpected affect of a consumer's attitude towards organic produce. While having a college degree had no significant effect on a shopper's decision to purchase organic produce if you differentiate undergraduate from graduate studies a trend was observable. Consumers with advanced degrees were actually less likely to purchase organic food than those without a degree and a graduate degree lowered the chance that they would be willing to pay a premium for pesticide-free produce (Dimitri & Greene 6, Thompson 1117).

Gender and marital status both display insignificant results on propensity towards organic products. Households with women as the head of the family were shown to be slightly more likely to purchase organic by a local study, but there have actually been relatively few surveys that have considered this variable. Marital Status also lacks attention in the set-up of surveys. One study found the effects of marriage statistically insignificant while another found that "healthy eaters", a group with a higher percentage of married people as compared to the national average was also a group who was willing to pay more to purchase organic food. The contradicting results of these studies indicate that more research is necessary to conclude any sound results (Dimitri & Greene 6, Thompson 1116).

Household size, or more specifically the presence of children in a household also had effects, although small, on a consumer's likeliness to purchase organic foods. This is one of the least researched aspects causing demand for organic products, but all studies either showed no statistical significance between households with and without children or an increased likelihood to purchase organic foods with the addition of children to the family. One study showed a correlation between the household size and picking organic produce (Thompson 1117).

Other factors found to positively affect the probability of purchasing organic foods are a household's knowledge of alternative agriculture, their concern for the environment, those concerned with food safety, and consumers who enjoy trying new products. Cosmetic defects negatively affect the probability of the product being purchased (Dimitri & Greene 9). The roots of the organic movement as a counter- culture movement away from conventional techniques can still be found in the demand. Geographic regions with strong counter cultures such as Santa Cruz and Berkeley display different buying patterns for organic foods. The demand here is much stronger than other areas with similar demographic characteristics (Guthman, "Agrarian Dreams" 191).

All of these studies make it difficult to draw a concrete image of the individuals that demand organic products. While it is obvious that the variables such as income, age, gender, marital status, education, household size, and store preference play roles in the demand for organic foods, it is unknown exactly how large of a role they play and how they interact with one another. More research is

needed in this area to make solid conclusions. It is important to understand the demand for organic produce so it can be determined how much policy interventions by the government will actually change the market outcomes.

Another important element to the demand for organic goods is elasticities, mainly price-elasticity, cross-price elasticity with conventionally grown products, and income-elasticity. The price elasticity shows how a 1% increase in price will change the quantity purchased in organic goods whereas the cross-price elasticity will illustrate how a change in the price of organic foods will affect the quantity purchased of organic foods. Income elasticity will demonstrate how an increase in a consumer's income affects the quantity purchased of organic produce. As of 1998 there was no studies completed on the significance of elasticities although the need more them was recognized (Thompson 1115, Krissof 1131). To date there has still been very little research in this area. One study found a high price elasticity of demand for frozen vegetables indicating that the quantity purchased will change drastically with the change in price (Dimitri & Greene 9). In a consistent finding 68% of consumers revealed that price is the main reason they did not purchase organic produce (Dimitri and Greene 6).

#### **IV. Supply of Organic Produce**

The development of the Organic sector of the produce market has been largely lead by demand. There exists an avid group of supporters of organic produce who actively seek out these products (Guthman, "Agrarian Dreams"

191). Suppliers scramble to meet this demand. Because this market is still in developmental phases it is sometimes hard to identify these groups in order to target them. Because organic produce is slightly linked with counter-culture areas of the country such as Berkeley and Santa Cruz show higher demand. Because this demand is varied in geographic locations one of the largest problems on the supply side is surplus. While it is obvious that demand exists, if the location of the buyer and the seller do not match, products will remain unsold largely due to the direct marketing used in organic markets. There is much uncertainty in the organic market for suppliers, which was identified as one of the main obstacles for converting more acreage to organic farming (Guthman, “Agrarian Dreams” 191, 197). As the market develops, the need to match the supply with the demand will need to be addressed.

In general, Organic farms tend to be much smaller than conventional farms. The founding populaces of the organic market were intentionally starting farms on small plots of land and sought organic farming as a way of life, not necessarily a method of profit (Guthman, “Agrarian Dreams” 8). Later on in the development of organic farms, small conventional growers were often pushed into the organic market unintentionally. If they were too small to compete as suppliers for major companies they are pushed into organic markets where in an effort to stay competitive. Since the majority of organic sales are done through direct market strategies such as farmers markets these small farms are competitive in the situation (Guthman, “Agrarian Dreams” 196).

Although most of the supply is pulled by demand, there are three main influences on the supply side that caused conversion to the organic portion of the market. First off there was the food scares of the 1980's (Guthman, "Agrarian Dreams" 197). There were two pesticide related scares revealed to the public in this decade. One was the finding of a pesticide called Aldicarb in watermelon fields. Aldicarb is highly toxic and is supposed to be used for cotton, a product that is not ingested. The other was a release of a report concluding that Alar, which was commonly used to ripen apples, was highly carcinogenic. Organic apples alone quadrupled in the state of California in this year (Guthman, "Agrarian Dreams" 104).

The second factor pushing supply was demographic changes within farm families. Many family farms that used to be large holdings of land have been divided between family members either as inheritances or to avoid the Federal Reclamation law. Left with increasingly smaller plots of lands, growers are forced to find a higher value product. The answer seems to be organic produce. There are also family farms in which the children have no interest in taking over, so the older generation downsizes production and begins growing a higher value product (Guthman, "Agrarian Dreams" 201).

The last factor pushing organic supply is changes in the structure of the industry. A system developed in California that facilitated subcontracting, so that smaller companies were subcontracted to make up for variances in supplies for the largest companies. The evolution of the California agricultural market led to a system in which the largest firms did all the shipping and marketing and if you

were not large enough to do this within your company you were left under marketing contract to a larger firm. This led to decreased surplus for the smaller grower because it was captured by the shipping and marketing company. To avoid this pitfall many farms chose instead to move towards organic farming (Guthman, “Agrarian Dreams” 201-203).

It is easy to see that the Organic farming movement has been largely pulled by the demands of consumers, but also pushed by supply side factors, Although organic farming may not be desirable on a mass scale that fact that a demand curve does exist for it means that same level of production is desirable in order to achieve equilibrium in this market. The question then becomes what that of policy. What are the implications for legislature? Is regulation desirable in this market and to what extent?

## **V. Policy Implications**

The largest reason for the need to regulate the organic market is that of mislabeling. Mislabeling allows companies with conventional products to capture a surplus from the price premiums offered for organic products. This information asymmetry causes inefficiency in the market. Because the seller knows more about the product than the buyer they are able to exploit the buyer. When the deception is uncovered, it will lead to consumer mistrust of the organic market. In this way the value of the market is undermined and the market will fail (Giannakas 1). To avoid this, policy becomes imperative.

As in the entire organic market, California has been instrumental in the development of legislature. As is, “organic food has come to be defined by its regulation” (Guthman, “Regulating Meaning” 141). The desire to protect consumers from false claims and to differentiate organic products from conventional ones in an obvious way has essentially turned into a list of unacceptable in-puts. To advertise different levels of organic you must comply with different percentages of inputs from the list. The involvement of the USDA in this process has been controversial as there has been immense input as to the type of standard that should be enacted (uniform or baseline) and how exactly they should be enforced once a standard is decided (Guthman, “Regulating Meaning” 142).

The problem with the current federal legislature is that it creates one standard for the entire country and in a market like organic farming methods must be tailored to the local environment and geography. A standard that works in one place may be a disaster in another. Federal legislation does not allow for this type of local variation. It is a top-down solution for a very localized objective (Guthman, “Regulating Meaning” 142). The need to be certified to claim organic leads to economic efficiency loses in the form of rents and barriers to entry. The certification process is costly and acts as a barrier to entry. Farms must be in accordance with organic standards for three years before they can officially receive the designation. This involves both high actual costs as well as opportunity costs (Guthman, “Regulating Meaning” 146). It is estimated that small to mid-size farms will pay \$579 to \$1414 to receive their first-year

certification at which point they go into an 18-month implementation period. At the end of this time it will cost another estimated \$6,120 to \$9,700 for the initial accreditation (Regulatory Impact Assessment). This is in addition to the transitional time period where their products still must be sold in the conventional market for conventional produce prices, but the yields per acre are dropping due to the process of switching to organic resulting in a much lower profit (Guthman, “Agrarian Dreams” 357). This is a huge cost for small growers to bear. Some growers who cannot endure these costs limit their sales to local, informal markets but they are excluded from sales at any state or national level. (Guthman, “Regulating Meaning” 146). The one exception to this rule is for growers whose total annual sales are less than \$5,000. They still must register, but are not required to become certified in the state of California. This is an attempt to not crowd out the very smallest establishments (Regulatory Impact Assessment).

The National organic program creates a floor for the minimum standard, but also unintentionally creates a ceiling. The lists of unacceptable inputs is long and growers must be vigilant to make sure they are in accordance with all of it or else face the consequences from regulatory agencies, including the possibility of the loss of their right to advertise an organic product. This guarantees a minimum standard for organic products. But meeting this list has become the norm for organic food, not the minimum. There is no economic incentive to be above the standards. It reduces the desire to produce the most organic product possible. If they were to do so, organic producers would be incurring

unnecessary costs to themselves in the eyes of the standard (Guthman, “Agrarian Dreams” 351). For example, organic farming seeks to create a product in harmony with nature. The key ways to keep organic soil fertilized and manageable is to use cover crops and composting. However, this is not highly regulated and no one would fail organic certification if they chose not to plant a cover crop. The standard allows for growers to not truly internalize the values of organic farming and just use the minimums to receive the certification (Guthman, “Agrarian Dreams” 353).

Along these lines, there are also arguments that the exclusion of certain inputs cause technology barriers. Weed control is one of the most difficult challenges to converting to organic standards. Growers feel they cannot deal with this problem without synthetic chemicals. Lack of research to alternative methods leave growers unable to emerge in the organic market. It is obviously undesirable to use chemicals as an easy way out to deal with weed problems, but the technological advancement is not thereto support the methodologies of organic farming (Guthman, “Agrarian Dreams” 354).

It seems to be desirable for the organic market to be more highly structured to reduce the uncertainty faced by suppliers concerning the demand for the good. It is easily flooded because of its small size compared to the conventional market (Guthman, “Agrarian Dreams” 374). Policies must be sensitive to the fact that much of organic farming is done on family farms that are small or medium in size. Regulation needs to be formulated in a way that ensures the continuation of their livelihood. The federal government recognizes

this need and allocated some funds to partially or fully subsidizes the cost of certification for growers (Regulatory Impact Assessment). In addition, increased research in this area could greatly benefit the transition and management of organic crops. According the Guthman the “lack of funds for organic research is...glaring” (“Agrarian Dreams” 354). Research could result in the development of natural products, such as soaps, oils, and garlic to be used to make pest management easier for the organic farmer (Guthman, “Agrarian Dreams” 353). The current standard has the right idea to encourage uniformity and provide information to the consumer about the product they are buying, which will eliminate information asymmetries, but this must be done carefully in order to avoid the burden of huge costs to growers and push them out of the organic market entirely. Just as information asymmetries cause inefficiencies, so does unmet demand. Increased research and subsidies to assist growers’ transition into organic farming and continue to meet the standards seems to be the most practical modifications to operate within the current framework.

## **VI. Conclusion**

Organic Markets have experienced rapid growth in the recent decades. Although they still constitute an extremely minor portion of the entire agricultural market it is important to understand the significance, or possible significance organic markets may have. California has been a leader in the evolution of the organic market structure in the United States. The first developments of the techniques and the legislature originated in California. The

journey to legally defining organic goods is still underway, but major successes have been achieved with the implementation of legislature on the national level. Continuing these legal developments will be crucial for the continued development of the market.

Current research suggests that entirely organic agriculture will not turn out to be the best solution for sustainable food production, but a strong demand for this product exists which means a market for the product should also exist. For this market to run as efficiently as possible there needs to be legal protection to avoid fraudulent organic products. Legislature must carefully balance this aim with the fragile nature of the organic market to allow for local specialization considering the characteristics of the area. This market has been largely shaped by the pull of demand to which suppliers respond. From the humble beginnings of organic markets as statement against conventional farming to its more widespread influence today, there is no sign of the end of the rapid growth of this market. Organic produce will continue to exist, striving to provide healthy, safe, and tasty alternatives to conventionally grown produce.

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