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**History, environment and community: Organic agriculture in the lower Wisconsin riverway**

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**I. Introduction**

The lower Wisconsin riverway is composed of many farming communities, both organic and conventional. Organic farming is growing nationally, but questions remain about the effects of organic farming on local communities. While organic farming may be environmentally and socially beneficial on a national scale, it is important to look at impacts on a local level. Organic farming practices such as crop rotation, cover cropping, and integrated pest management may affect the surrounding environment differently depending on the crop, climate, and soil type. Local assessments of organic practices and their noticeable effect on environmental quality are necessary to understanding the benefits of organic farming in the lower Wisconsin riverway. It is also common for organic farmers to have close community ties through farmers markets. The importance of farmers markets in strengthening communities and providing income in the lower Wisconsin riverway should be determined. Because of variations in environments and community structures throughout the nation, it is important to consider organic farming on the local scale of the lower Wisconsin riverway to determine whether it is a successful and healthy farming method for the region.

**II. Survey Methods**

We administered a mail survey to 60 organic or sustainable farms within the lower Wisconsin riverway. We retrieved our addresses from the Southern Wisconsin Farm Fresh Atlas. We sent our survey to all organic or sustainable farms that have accessible addresses in the Southern Wisconsin Farm Fresh Atlas. All of the information gathered through the survey

will remain anonymous. Our main objective is to gain information about the farming history, farm practices, environmental changes, farmers markets, and community values about organic farming. The data are mainly qualitative and subjective. Our questions are composed of both multiple choice and short answers needing no more than one sentence response. Through analyzing our results, we are able to better understand the history of organic farming in the lower Wisconsin riverway. We also gained information about specific organic farming practices and environmental changes that have been visible on the farms. We are also able to gather primary data about individual values about organic farming and farmers markets. The quantitative data we collected is put into bar graphs to easily see differences across farms. Secondary data are necessary to understanding the history, environmental impacts, and community values associated with organic farming nationally and globally. Secondary data are also used to compare the interview data to other organic farming communities.

### **III. Literature Review**

Agriculture is important worldwide as it provides the means to which humans survive and thrive. Deviations from traditional and standard agricultural methods, therefore, are often controversial and heated topics. Organic farming has been one of the most debated farming methods for the past few decades. Much of the literature conflicts with each other and thus adequately represents its controversial nature.

In the six counties surrounding the lower third of the Wisconsin riverway, there are 248 organic farms, making up a total of 20,701 acres. Furthermore, 142 farms and 5793 acres are currently being converted to organic farming in the region. These six counties have over \$14 million in annual organic sales, the vast majority of which come from farms with over \$5,000 in

annual sales. Nearly 60% of organic sales are in the form of livestock and poultry products such as milk and eggs. (Census of Agriculture, 2007)

## **History**

The organic agricultural movement has been growing with increasing intensity since at least the 1960s with roots as early as the 1940s. In 1962, Rachel Carson published *Silent Spring*, a book about the dangers of chemicals like pesticides and herbicides to humans, animals, and the environment. This book launched a public outcry against the use of certain chemicals - particularly Strontium 90 and DDT - but largely permitted the continued use of many other chemicals in agriculture (Murphy, 2007).

In the 1970s and 1980s, the United States public perception held that there was a real “farm crisis” in that there were more and more farmers going out of business and family farms were shutting down at alarming rates across the country. In actuality, according to Michael Bell in *Farming for Us All*, the general trend of the entire twentieth century was in fact an overall decrease in the number of farmers, with no real change in the 1980s.

Whatever the reason, the 1970s and 1980s brought about a surge in media and academic coverage of agriculture in the US. As people -- researchers, farmers, and the general public -- were getting more and more worried about the state of agriculture, they began to investigate alternative options, like organic farming. In 1981, Shearer et al. found that while organic farms do not out-perform conventional farms in favorable conditions (good weather, etc), they do in fact produce more than conventional farms under unfavorable conditions (Shearer et al., 1981). Also in 1981, Lockeretz et al. found by using a mail survey that organic farmers in the Midwest were more like other Midwestern farmers than they were like stereotypical organic farmers in

their farming practices (aside from chemical inputs), labor requirements, production levels and profitability (Lockeretz et al., 1981).

### **Recent History**

Periodically, the UW-Madison Center for Integrated Agricultural Systems does a status update report for organic agriculture in Wisconsin. In 2008, they found that there was a 45% increase in the number of certified organic farms in Wisconsin between 2005 and 2007. They also found that since 2002, Wisconsin has consistently ranked second in the number of organic farms in the United States, with the highest concentration being in the southwestern area of the state and Vernon County having the most organic farms (CIAS, 2008).

### **Overview of Organic Farming Methods**

There are various requirements that organic producers nationwide are required to fulfill in order to be certified as organic. For crop farmers, these include having land in organic-style production for three years before deeming it organic, managing soil fertility with through the use of mechanical cultivation and animal waste products, reducing pests without the use of prohibited chemicals, giving preference to organic seed, and avoiding genetically engineered material altogether. For livestock farmers, standards include raising animals for slaughter organically for virtually their entire lives, raising dairy animals organically for at least 12 months preceding organic labeling, feeding animals a 100% organic diet, completely eliminating the use of antibiotics or hormones, and giving all animals access to the outdoors (USDA, 2002), (Delahaut et al., 2007).

Depending on the farmer, various practices can be used to meet organic standards and attain certification. For instance, Posner et al. (2008) describes circumstances on the Krusenbaum Dairy Farm from 1996 to 2005. Located in Southern Wisconsin, this farm utilizes

practices that are relatively common across the state to achieve organic status. The Krusenbaums practice rotary hoeing and mechanical cultivation to reduce weed pressure on their crops. Although they still experience some crop loss from weeds, they are able to keep this loss below an estimated 10%. For fertilization, the Krusenbaums take advantage of the full potential of their herd's manure. The family stores manure for in a concrete holding pad, before composting it on the edges of their fields and eventually spreading the manure across their fields in late summer. The storage of manure is only necessary for the Krusenbaums in the winter, though, because when the weather is nice enough they practice rotational grazing, which means their herd is out on a field spreading its manure naturally.

The Krusenbaum's farm gives a sense of some of the practices that can be found on organic farms, but they surely do not cover anywhere near the entire variety of different approaches to management that are out there. For instance, some farmers are experimenting with a method for reducing weeds that involves passing a flame over their fields (Bell, 2004). In addition, Hedtcke et al. (2006), discuss crop rotations that are substantially more diverse than the corn-corn or corn-soybean rotations seen on many Wisconsin farms. One example given by Hedtcke et al. of a somewhat more complex crop rotation that is likely utilized by many farmers in the region is that of corn one year, soybeans the next, and final year where oats and clover are grown together. In another example, corn can be followed by two years of alfalfa. Both of these examples are three-year rotations, but depending on a farmer's goal, rotations can involve several more seasons before repeating themselves. Often in complex rotations, farmers plant cover crops for a variety of reasons that will be discussed later.

### **Impacts of Organic Farming Methods**

Organic agriculture has a variety of accepted practices that are often considered environmentally sustainable. With the increase in organic farming surrounding the lower Wisconsin riverway, it is necessary to understand the environmental impacts of organic practices. Issues such as pest management, weed control, and fertilization in organic agriculture consist of many different methods when compared to conventional practices. By looking at the combined environmental effects of organic practices such as crop rotation, cover cropping, fertilization methods, and pest and weed control, the benefits and harms of organic farming to environmental quality, especially in soils, can be assessed. As organic production is becoming increasingly common around the lower Wisconsin riverway, it is necessary to understand how these organic practices affect the environment, specifically, the soil quality.

### **Conventional vs. Organic: Soil and Yield**

Overall, organic farming is considered more efficient at storing soil nitrogen, increasing soil organic matter, increasing water infiltration into soil, increasing biodiversity, and increasing decomposition rates (Mader et al., 2002). In comparing conventional and organic fertilizer practices over a 5-year study, Herencia et al. (2008) found that organic soils using manure fertilizer contained significantly more nitrogen, phosphorus, potassium, manganese, iron, and zinc (Herencia et al., 2008). Although the availability of these nutrients is mainly regulated by soil organisms and climactic variability, it has been suggested that overall, organic production practices improve soil organic matter, nutrient cycling, decomposition rates, and fertility (Mader et al., 2002; Herencia et al., 2008; SARE, 2007).

Although organic production has proven to improve soils, the yield of organic products are often quite variable compared to conventional farming. Posner et al. (2008) conducted a 12-year study in which conventional yields of corn, soybean, and alfalfa were compared with organic yields. He found that organic corn produced 91% of conventional, organic soybean produced 92% of conventional, and alfalfa produced 10% more than conventional. Although on average, organic yields are not too far off from conventional, and in alfalfa they were higher, Posner et al. (2008) does note that organic yields fell dramatically, to as low as 74% of conventional in corn, during very wet seasons in which weeds became a major problem (Posner et al., 2008). Organic yields may vary due to differences in climate and farm practices even if soil fertility and biodiversity is ultimately greater than on conventional farms. These varying organic practices essentially determine farm success. With many practices being used, and many still undergoing research, it is important to understand how these practices can affect yields and soil quality in organic farming.

### **Crop Rotation and Cover Crops**

Crop rotation helps the success of organic farms in many ways. It consists of seasonally planting different crops, which in turn interrupts pest cycles, decreases disease prevalence, and reduces weeds due to frequent harvesting. Rotations can also help build organic matter in the soil. In rotations, soil erosion is very low because the soil surface is impacted less by erosion pressures such as rain and wind. Due to the absence of monocropping, biodiversity of soil organisms, weeds, and beneficial pests are increased tremendously (Kuepper & Lance, 2004). A common crop rotation in Wisconsin includes alfalfa, corn, and soybean. The soybeans help to fix soil nitrogen for the corn to uptake while the constant rotation interrupts deadly rootworm

and soybean nematode pest cycles (SARE, 2007). These rotations are highly beneficial to the success of organic farming.

Cover crops are often used to increase soil fertility by capturing nutrients that would normally leach out of the soil if it were to be left in fallow. Natural predators are increased which can decrease harmful pests and disease. Organic matter in the soil is improved as well, which in turn increases water infiltration by 50% and decreases runoff by 35%. Cover crops can also be used as a weed control mechanism in which weed inhibiting crops such as rye do not allow weeds to overtake the land (SARE, 2007). Cover crops, like other organic practices, are focused on increasing soil fertility and biodiversity in order to keep nutrients on the farm instead constantly depleting the soil resource.

### **Fertilization**

Because conventional and often harmful fertilizers are not used on organic farms, other methods have been implemented which are extensively less detrimental, and sometimes more beneficial to the environment than heavily applying chemicals. Although they may not be as effective, organic fertilization techniques help maintain biodiversity and soil fertility. One common fertilization technique is manure or plant compost application. These processes help to increase soil organic matter and develop and maintain a defined soil structure. Good soil structure allows for increased plant water availability, nutrient cycling, and microbial activity. Manure or compost can also control weeds through smothering (SARE, 2007). From an overall environmental standpoint, decreasing chemical use on the land is highly beneficial to both the local ecosystems surrounding the farm, and the water quality during runoff. When organic farms combine crops with livestock, manure fertilizer is also readily available and essentially cheaper

than buying conventional chemicals. Fertilization is an important aspect of farming, and the organic methods have many environmental benefits over conventional norms.

### **Pest and Weed Control**

Organic farms often struggle with pests and weeds. As discussed earlier, many practices already help interrupt these cycles including crop rotation, cover crops, and manure fertilizer. It is necessary for organic farmers to understand pest and weed cycles throughout the season in order to learn how to control them. One option, if a pest becomes burdensome, is to introduce a natural predator (SARE, 2007). This can be an effective method to remove pests while not harming the environment with chemical pesticides. Other types of pesticides that can be used on organic farms include minerals, soaps, and pheromones. These organic pesticides and herbicides must be natural and have a short residence time in the soils (Kuepper & Lance, 2004). Although applied like conventional chemicals, they do not have the longstanding environmental harms to the farm and surrounding areas. Weeds can also be an issue on organic farms, and ridge tilling through mechanical processes is a common practice which both decreases weeds while not destroying all the soil structure (Kuepper & Lance, 2004). In a no till system, which is essentially best for soil structure, biostrips can be implemented in between crop rows. This allows for natural vegetation, such as wildflowers, and beneficial insects to thrive. This often helps to decrease weeds and sustain soil structure and fertility. Biostrips also provide plant compost as fertilizer and improve biodiversity both in the soil and above ground (SARE, 2007). Weed and pest control can be a difficult process without the application of chemicals, but organic farmers prove that environmentally beneficial methods can be applied and managed effectively.

## **Community and Farmers Markets**

Rural communities have been drastically reduced in the past few decades, and for the first time in the history of the world more people live in cities than not. Although these changes are the result of multiple social causes, one of the most important, and most apparent in the Midwest, is due to the decline in agriculture. Decline, in this sense, means in the number of people farming, not necessarily the amount of land being farmed, for that has remained largely constant. (Holthaus, 2006). Organic farming's main pretense is that it is better for the land ecologically as compared to conventional farming. An important question that follows then is to what degree is organic agriculture better for the human social environment?

To find the answer we must first acknowledge the relationship between agriculture and community. According to Gary Holthaus, author of the book From the Farm to the Table "everything exists in a system larger than itself" and agriculture is not exempt from this claim (Holthaus, 2006). Holthaus explains that when agriculture, the farmer, the surrounding environment, and the community are all healthy that the system is mutually supportive. "When a component of the system is diminished, the farmer for example... then the whole system is apt to fail" (Holthaus, 2006). This understanding that the health of the farm and the farmer greatly affects the surrounding community is crucial to understanding the recent trends in declining rural towns and declining numbers of farmers and small farms.

Conventional agriculture is becoming increasingly monopolized with more farmers collapsing every year due to an inability to compete economically. In his book on practical agriculture in Iowa, Michael Bell writes about the decreasing numbers of farmers and its affect on community. "More than individual farmers get squeezed out by the farmer's problem. Whole

communities do. The changing structure of agriculture is restructuring rural culture... It is hard to maintain a community based on agricultural businesses if there aren't many farmers" (Bell, 2004).

One way that many communities are maintaining ties and staying afloat economically is through farmers markets. In the Midwest the sheer number of farmers markets speaks to their importance; according to the Southern Wisconsin Farm Fresh Atlas there are over forty markets in Southern Wisconsin alone (Farm Fresh Atlas, 2009). Barbara Kingsolver, author of the book Animal, Vegetable, Miracle states "buying your goods from local businesses rather than national chains generates about three times as much money for your local economy" (Kingsolver, 2007). Community Supported Agriculture farms, who sell directly to consumers committed for an entire season, are also growing in numbers and are having the positive effects of educating and allowing more community participation in the farming process (CIAS research brief #21, 2006).

Because organic farms are traditionally smaller enterprises than conventional farms due to lower yields, increased labor inputs and premium quality products, they are more likely to have a sustainable business model and engage in more local business activity in order to stimulate farm income. Organic is not intrinsically linked to sustainability however; the definition of organic by the US department of agriculture is a production claim only. Although historically the purpose of organic was not just to protect the quality of food products, but also to safeguard farm environments and communities, (Kingsolver, 2007) industrial-scale organic agriculture has grown to take advantage of the premium price for the organic label. Kingsolver in particular is extremely critical of this large-scale organic agriculture because it says nothing about the sustainability of the food production; only that it meets legal guidelines. Kingsolver also makes the point that organic certification through the USDA can be extremely costly,

leaving many small farms unable to afford the organic label. These farms in turn embrace local business models and farmers markets where they are able to convince their buyers directly that their methods are ecologically friendly despite their lack of government certification. Because of these recent trends towards industrial organic farming it cannot be assumed that all organic is better for the community but instead that small-scale sustainable agriculture, which often times includes organic, is the best remedy to keeping local economies thriving.

#### **IV. Results and Discussion**

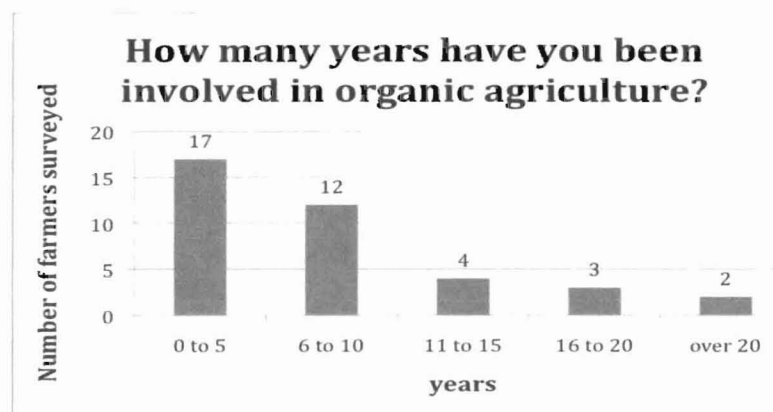
The survey was sent out to 60 sustainable and organic farmers found in the southern Wisconsin farm fresh atlas. We received 38 responses. Many farmers use organic methods to farm but are not certified organic due to the cost of certification, some extra labor inputs, or other reasons. It was important to gather data from even those who are not certified organic to show the effects that organic agriculture has both ecologically and socially. Most of the farmers who responded to the survey were not certified organic, but they were all self-proclaimed sustainable farmers, and in that sense still treated the land in the same manner as organic farming dictates. Both groups are so similar in nature and so far from conventional that we felt it was okay to group both together.

#### **History**

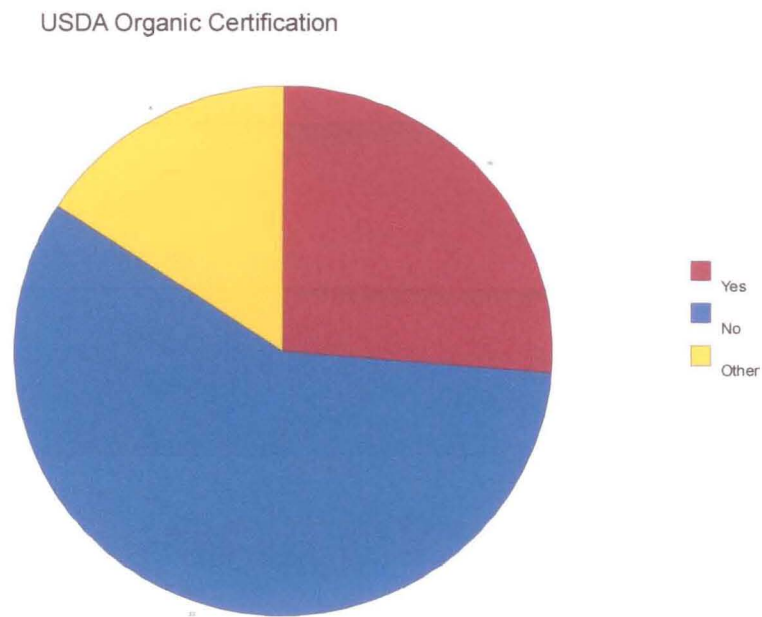
To get a basic idea of where most of the organic or sustainable farms are located, our first question asked which county the respondents' farms were in. Our 38 respondents represented 10 counties in Southwestern Wisconsin. More than 2/3 of the respondents reported being located in Dane County, which is not surprising considering it is the most populous county of our researched area. The next highest number of respondents were from Iowa County, but this was only 3 farms. The lowest number - just one farm - came from Crawford County.

We found through secondary research that, on average, organic and sustainable farms are smaller than conventional farms. Our survey supported this, showing that 24 of the 38 farms had 0 to 10 acres of organic land, whereas the total acreage had a much larger range with 4 farms being over 500 acres. As of the 2007 Census of Agriculture, the United States average acreage for farms is 418 and Wisconsin's average is only 194 acres (Census of Agriculture, 2007). This could reflect the fact that Wisconsin has such a high number of organic farms compared to the rest of the country. It must also be taken into account, however, that some of the respondents considered themselves sustainable and were not certified organic farmers. They would necessarily fall into the 0-10 organic acres category, thus possibly skewing the answers slightly. Overall, though, the survey data support the fact that organic farms are smaller when compared to United States farm size averages.

The next questions we asked related to the number of years the respondents had been involved in farming in general and how many years they had been farming organically. We found the median number of years for farming to be between 21 and 25 years, with the largest group of people reporting 6 to 10 years of farming experience. The median number of years of organic farming was much lower - 6 to 10 years - with the largest group of people reporting 0 to 5 years of organic farming.



This is indicative of the relatively recent popularity of the organic farming movement in the lower Wisconsin riverway and in the United States. The USDA only began organic certification in 2002, so it is possible that some farms may have been using organic practices for longer, but have only recently been certified. Only 10 of our 38 respondents are certified organic, but at least 4 were either going through the certification or were MOSA certified.



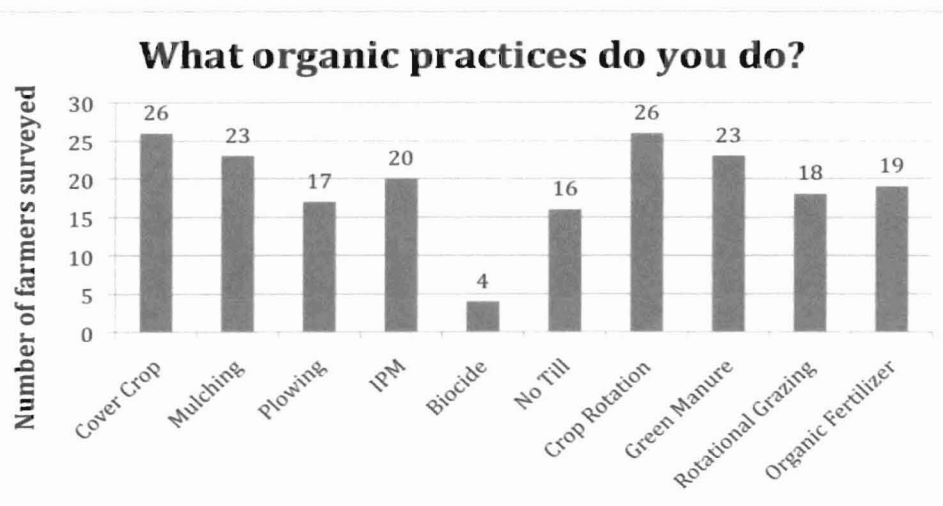
Many respondents cited difficulty of paperwork or certain restrictions as reasons for not becoming certified even if they were essentially an organic farm. Overall, organic farming is a fairly new method in the lower Wisconsin riverway.

### **Impacts of Organic Farming Methods**

When the subjects of our survey were asked what practices they are implementing in order to make their organic/sustainable operation work, most clearly responded that their farms require a variety of practices working in tandem. For instance, the vast majority of farmers were using cover crops, mulching, crop rotations, and green manure, along with other practices to see

desired results. This makes sense, because unlike conventional farmers, those focusing on sustainability cannot simply apply chemicals and expect those to take care of everything. Instead, an integrated approach that can vary significantly from year to year is required to make a sustainable farm work.

Particularly interesting results to this question included that with the exception of biocides, a relatively new and expensive management option, the practice that fewest of our respondents were implementing was no-till. This is likely due to the fact that no-till often requires some sort of chemical applications in order to successfully reduce pests, as tillage cannot be relied upon to do so. On the other hand, slightly more but close to the same number of respondents that didn't implement no-till did implement plowing. The numbers show that about half of farmers do not till, and about half do, with very few using both practices on different fields. This may suggest a split in the management approach between those farmers concerned with erosion and those that place it secondary to other concerns. However, many of those surveyed practiced rotational grazing, a practice that is virtually incompatible with no-till; it is possible that there is no management split as suggested, but instead those who do not till are those who are simply unable to do so.



Farmers were also asked about changes they have seen on their farms since converting from conventional agriculture. Regarding soil erosion, almost everybody replied that they have seen a decrease in the amount of eroding soil. Very few replied that erosion rates are the same as before they became organic/sustainable, and none claimed that it has gotten worse. One farmer said that his low erosion rates are not simply because of following organic rules, implying that he does more than required to reduce soil loss. Overall, it was clear from responses that these farmers are doing whatever they can to reduce erosion, and are deeply interested in keeping their soil.

Most farmers also responded that they have seen improved water quality on their organic/sustainable farms. However, many of our respondents said that they are unsure of their farm's water quality, as they have performed no tests on it. In fact, nobody seems to have tested water quality on their farm, even though most perceive that it has improved. While it is common for farmers to conduct soil tests in order to find out exactly what their soil has enough or too much of, it seems that they have little to no interest in determining the precise quality of their water. This is likely because crops will grow just as well if water quality is good or bad, so there is no economic incentive to test water quality. But for farms that pride themselves on being concerned with the environment, it is interesting that nobody has even thought to verify that they are improving the surrounding water.

Like with soil and water quality, farmers have seen improvement in the health of their animals. Aside from the general consensus that animal health has improved since making the switch, there were a couple of interesting answers. One farmer has noticed improvement in the health of his animals, but was reluctant to make the claim that this was due to her new approach to farming. Another farmer noted that her livestock are more susceptible to changing weather,

which seemed to contradict other farmers who thought that keeping animals outside in fresh air gave them healthier and happier lives. Overall, responses to this question clearly showed that organic/sustainable farmers are more confident about the health of their animals than they used to be, even though they do not rely on vets and antibiotics.

Yet another question asked to farmers about changes in their farm was whether or not they are producing comparable yields to what they used to get. To this question, nobody replied that yields have gone up. However, there were quite a few farmers that claim to be experience the same yields as before. Also, many farmers who are producing reduced yields have seen these increase year after year the longer they farm organically/sustainably, verifying that there is quite a learning curve involved in making the switch. Two farmers noted that the weed pressures they observe can really hit their yields, especially during wetter years. It is encouraging to see that yields under organic/sustainable management are not drastically lower than under conventional agriculture, and the fact that they improve over time as farmers become increasingly versed in sustainable agriculture should also be uplifting to farmers.

When dealing with sustainable or organic practices, some farmers may feel that regulatory organic practices are not necessarily sustainable. It is important to determine how farmers view the aspect of sustainable management within organic farming techniques. When asked whether as a farmer, they feel their organic practices are environmentally sustainable, 71% of respondents said “yes”, 13% said “no”, and six people did not choose to answer. By leaving some room on the survey for people to write about why they thought their farm was sustainable, nine “yes” respondents and only two “no” respondents gave a written answer. There were many positive answers about why organic practices are environmentally sustainable. Many respondents gave environmental reasons such as better soils, high quality crops, less fertilizer

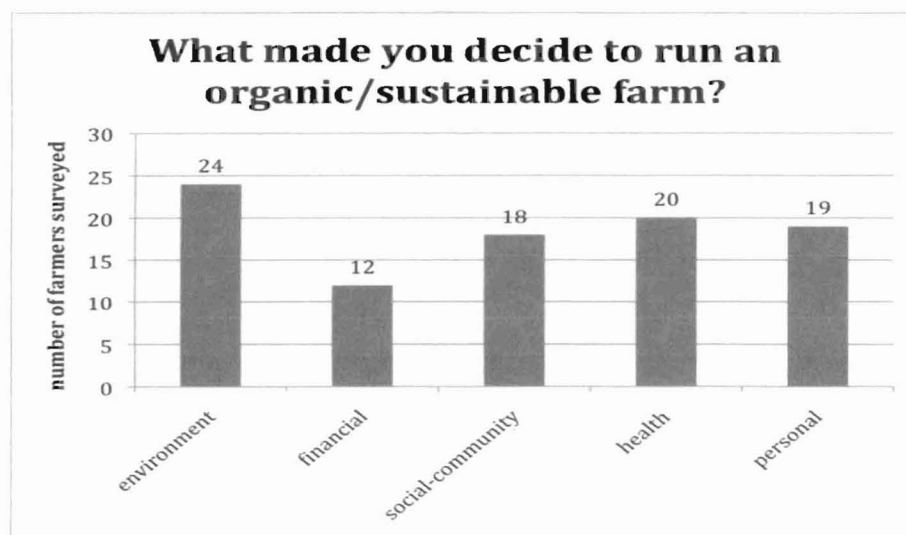
and herbicide inputs, and better biodiversity. One farmer wrote thoughtfully that, “sustainability on our farm is highly important and organic methods combined with pasture management, less annual cropping, and more perennial production are important in creating a more environmentally sustainable farm.” It is easy to see that farmers believe in their practices and trust that they are doing what is best for the environment and their community. The two written response from farmers who did not believe organic practices were sustainable suggested that overall, conventional farmers are using less chemicals. It may be suggested from this question that sustainable and organic farmers in the lower Wisconsin river way consider themselves environmentally sustainable whether they are certified organic or not. It also suggests that although many farms are not certified, they still practice organic methods on their farm because of their underlying belief that a sustainable farm is environmentally beneficial.

Although many farms believe they are being sustainable, even if they are not organically certified, we wanted to determine if there were any practices that farmers considered organic that were hurting the farm or the surrounding ecosystem. While 11 out of the total 38 respondents did not answer the question, 55% said that they didn’t feel anything they were doing was hurting the farm and 16% said there were some problems with some organic farming practices. From the farmers who said that organic practices do not hurt the farm or environment, five written answers focused again on the environment. Many respondents wrote that organic farming is safer for the environment because of decreased inputs. One farmer discussed that, “all farming has dramatic impacts on the environment, even organic farming. The key is to balance these impacts on the environment.” Farmers are aware that agriculture cannot be fully sustainable. However, many of them realize that by using organic practices, they can create a better environment for their crops and the surrounding area. Out of the 16% of people that did feel

some of their organic techniques did hurt the environment or the farm focused more on labor and economics suggesting that there was too much record keeping, organic feeds are expensive, and labor intensive weed control is difficult. Although some farmers believe that organic practices are more expensive and create more labor, the majority of respondents acknowledged that organic farming is overall the best method to create a healthy environment and a sustainable farm. Farmers are well aware of how their farming impacts the environment, especially farmers who switched from conventional to organic recently. Many of them are viewing the changes on their farm using organic practices as sustainable.

### **Community and Farmers Markets**

After detailing the methods and data behind the organic movement and its ecological effects the survey asked questions that got into the heart of the organic agriculture movement. The first of these questions was “What made you decide to run an organic farm?” of which we listed six possible answers (environmental, financial, social-community, health, personal, and other) and asked the interviewees to circle all that applied.



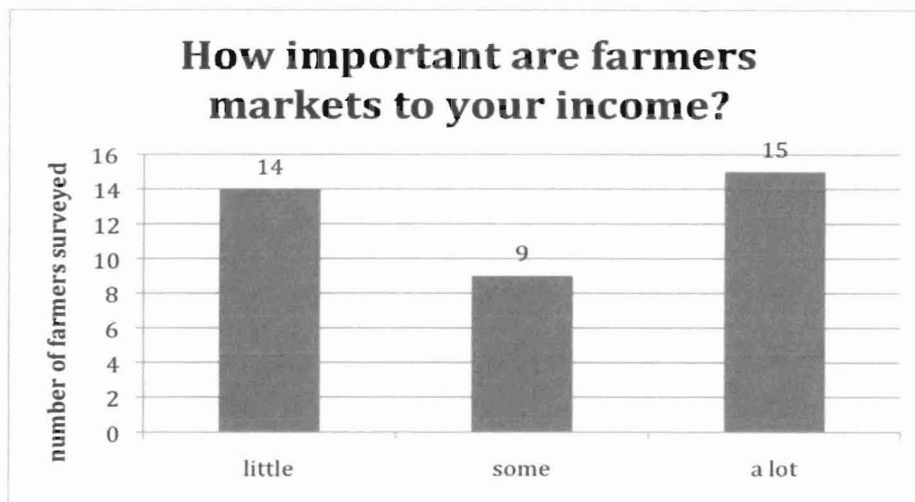
The environment was the most popular reason chosen to do organic farming, which complies with our thesis that organic farming is more sustainable ecologically for the land than

conventional agriculture. Health was the second most popular answer and although the survey did not specify to whom health referred, it can be inferred that human, animal, and plant health was included in this reasoning. What the response to this question really shows is that farmers who switch to organic are showing an almost equal appreciation for environment, social-community, health, and personal reasons, and very little concern over the financial stability of the new method of agriculture.

Next on the survey was the question “Which farmer’s markets, if any, do you sell at?” which was intended to get a geographic image of the connections between individual farms and the locations of selling. This question was also used to ascertain the popularity of certain farmers markets with individual farmers; if there were any more popular than others and if most farms only sold at one farmer’s market or played to a variety of communities.

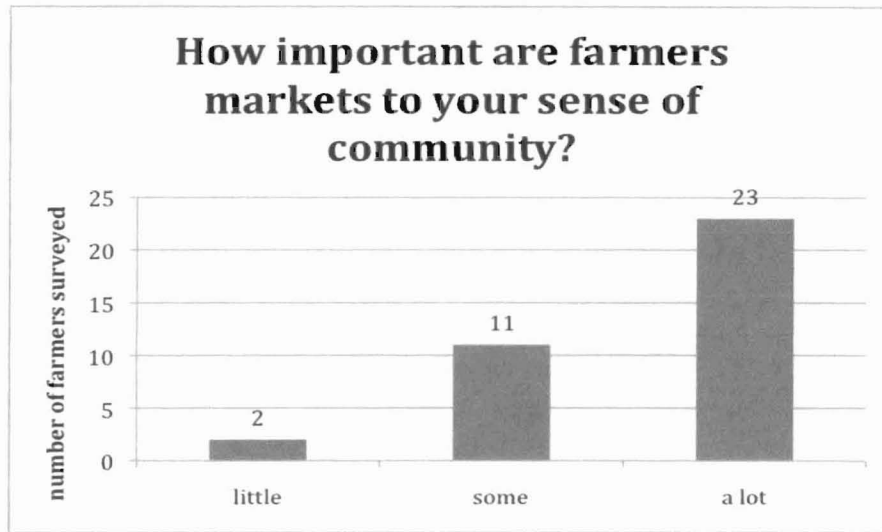
Of the 38 farmers that responded to our survey, only 3 did not sell at any farmers markets. This alone shows the importance of farmers markets for organic and sustainable farming, as it is often cited as the best way to directly connect farmers with customers on a personal level. There were 16 total farmers markets that the surveyed farmers sold goods at, and of these 16 the Dane County Farmers Market was the most popular with 18 of the surveyed individuals selling goods there. The DCFM is the largest producer-only farmers market in the nation, and due to the results of this survey it is easy to see how. Nearly half of those surveyed sold at this market, which shows the importance of participating in Madison’s favorite farming tradition. Although Madison is the capitol of Wisconsin and quite a large city compared to the other smaller communities within the Lower Wisconsin River valley, the DCFM still provides that sense of community and the connection with local growers that the food-conscious consumers of Madison search for.

The next question on the survey related Farmer's Markets to income, the survey asked, "How important are farmer's markets to your income?" and the results were quite interesting.



What these results show is that farmer's markets are either very important or not at all in relation to income, with few surveyed in the middle. For those whom farmer's markets make up a significant portion of their income, it can be assumed that they put most of their efforts into selling at these markets. For those who don't find markets contributing substantially to their income they must be making up for that economically in another area. This could be through whole-saling to natural food stores, grocery stores, or through operating a CSA. Although CSA's are very community oriented they often conflict with farmers markets; the farmers have to make a commitment early on to their CSA members to provide a set amount of crops each week, therefore only the leftovers get sold at the farmers markets, leaving a much smaller contribution to their income. It is also important to note that although 14 farmers said farmer's markets contributed only little to their income, only 3 of those surveyed were not participating in any markets. This means that 11 farmers still sell at farmers markets despite only a small financial incentive, leading to the conclusion that there must be some other more important benefit they receive from the markets.

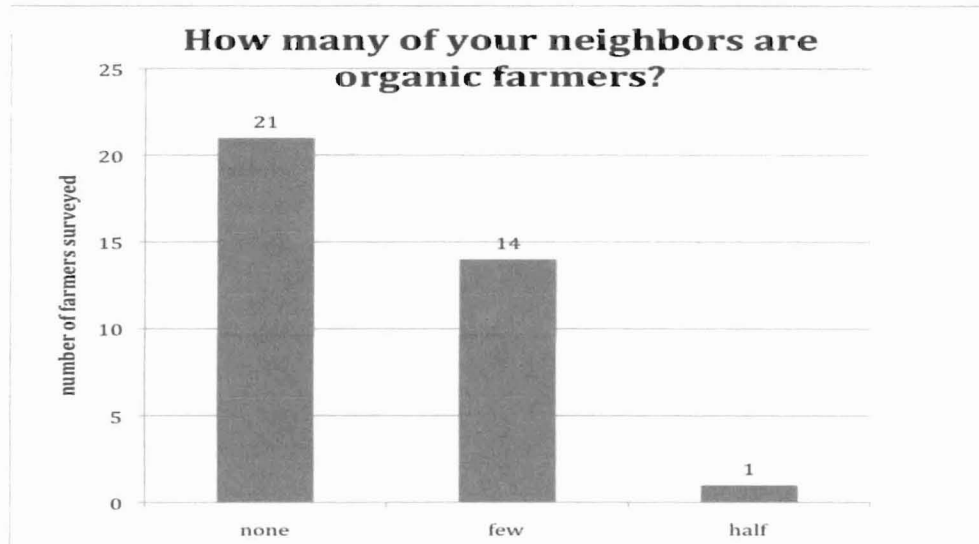
It is reasonable to presume that many farmers get a sense of community from farmers markets, which could be a reason to justify selling there. The next question on the survey asked “How important are farmers markets to your sense of community?” and the results are overwhelmingly clear.



The results show that 63.8% of those surveyed feel that farmers markets contribute a lot to their sense of community, while another 30.5% feel that they contribute some to their sense of community. These numbers are huge and testify to the theory that farmers markets are vitally important to maintaining a sense of community, especially in rural areas.

The survey asked next “Are you a Community-Supported Agriculture (CSA) Farm” and gave the options yes, no, and considering it. While 22 said “no” 9 farmers replied that they were a CSA and 7 more replied with “not yet, but considering it”. Although the numbers for CSA’s may seem low, it is important to remember that not all sustainable farms are capable of becoming CSA’s simply because so many specialize in one or a few crops instead of many. For instance a dairy farm, or a honey-bee producer could be a CSA but probably would not be very successful given that they have so little variety to offer in terms of crops. These specialty producers benefit the most from farmers markets and direct selling to restaurants and food stores.

Since community is such an integral part of organic and sustainable farming the next question on the survey was “How many of your neighbors are organic farmers?” in order to ascertain whether there are trends within certain communities to do organic agriculture.



The results to this question were expected, although the responses “most” and “all” were offered, there were no surveyed farmers that selected these answers. Organic agriculture in its recent widespread application is still a new movement and it is normal that most farmers are not seeing many of their neighbors following the trend. Organic farms are also traditionally smaller than conventional farms, meaning the farmers would have fewer neighbors to begin with.

## **V. Conclusion**

Organic farming is a relatively recent phenomenon in the United States and Wisconsin. Between 2002 and 2007, over 2 million acres of land in the United States became organically certified (Census of Agriculture, 2007). The data also show that most organic farmers in the lower Wisconsin riverway have, on average, smaller plots dedicated to organic agriculture than the average total farm size. Our survey data show that for certified and uncertified organic farmers, regardless of length of farming in general, organic practices are a comparatively new

idea. Even though certified organic farming is more recent, there are a number of farming techniques that are commonly used in agriculture, especially in the lower Wisconsin riverway.

For organic/sustainable farmers in the lower Wisconsin riverway, one or two practices cannot alone address the needs of a farm. Instead, a multi-faceted approach that implements several practices at once is used to simultaneously address the various aspects of farm management. Even considering the minimal hit that farmers seem to experience in yield because of their attempts at sustainability, overall on-farm changes since converting to a sustainable approach are quite positive. Soil erosion, water quality, and animal health for farmers that responded to our survey have all shown substantial improvement. Also, farmers seem to be genuinely proud of the changes they have seen on their farms. Farmers in the lower Wisconsin riverway, both organic and sustainable, overwhelmingly feel that by using organic techniques, they are being more environmentally sustainable. This brings light to the hope that through the sharing of knowledge with neighbors, more farmers will be able to recognize that organic farming puts less pressure on the environment and can create a healthier and more sustainable farm for the community.

The Midwest, once America's heartland, is seeing huge declines in the numbers of people farming, as well as declines in rural communities and social health. Sustainable farming, by nature, is a means of connecting people with each other, especially farmers and consumers, through its small-scale applications and stewardship of the land. As we've seen through the survey and the literary analysis, organic agriculture done in a sustainable manner, provides this same renewal of community through the growing farmers markets and direct selling to consumers. Our research supports the idea that organic and sustainable farming is beneficial both environmentally and socially in the lower Wisconsin riverway.

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