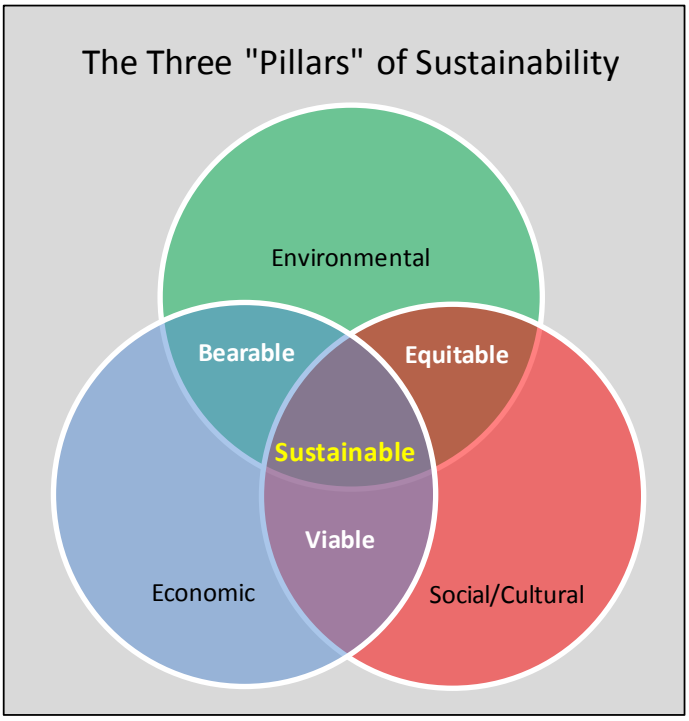
The 2007 Census of Agriculture:
Sustainability Practices on Maryland's Farms

Introduction

The 2007 Census of Agriculture contains information on farm practices that are directly or indirectly related to sustainability. While the concept of sustainability is broad, in agricultural terms it can be thought of as "agri-food systems that are economically viable, meet society's need for safe and nutritious foods, while conserving natural resources and the quality of the environment for future generations."[1] In other words, sustainable practices minimize or eliminate "negative externalities," or activities that burden the general population with the costs of an activity while the benefits only accrue to select individuals. As this definition implies, the concept of sustainability has three major "interdependent and mutually reinforcing pillars"[2] – economic, environmental, and social/cultural. Economically sustainable practices help farms to increase profits, decrease costs, and mitigate financial risk; environmentally sustainable practices protect farmland and the local ecosystem through soil conservation and land preservation efforts; and socially/culturally sustainable practices help to preserve farming culture and cultural artifacts, as well as creating strong community ties between farms and local residents.



Most of the practices relating to sustainability listed in this report were new for the 2007 Agricultural Census, so there is no time series comparison data available. Others were measured in previous censuses, but their definitions have changed for 2007, making comparison difficult. The practices discussed in this report are grouped into the three pillars discussed above. Economic sustainability is measured by tracking farms that produced and sold value-added commodities, farms that generated energy or electricity, farms that marketed products through community supported agriculture (CSA) and farms that sold products directly to consumers for human consumption. Environmental sustainability is measured by tracking farms that used conservation farming methods, farms that used organic farming methods, and land enrolled in conservation programs. Finally, social/cultural sustainability is measured by tracking farms that had a barn built prior to 1960.

[1] B. Smit, Concepts of Sustainability, Agro-Ecosystem Health and Applications to Agricultural Production, University of Guelph, Guelph, Ontario, Canada, http://www.ilri.org/InfoServ/Webpub/Fulldocs/Aesh/Concepts.htm.

[2] United Nations. 2005 World Summit Outcome. http://www.who.int/hiv/universalaccess2010/worldsummit.pdf

Readers should note that the practices chosen for this report are ones that were included in the 2007 Agricultural Census that can be taken to measure sustainability. They do not represent a comprehensive review of farm sustainability, nor was the Agricultural Census designed to measure farm sustainability in a comprehensive manner. However, these practices do give a glimpse into how farms are handling sustainability issues.

On the whole, Maryland's farms rank well when compared to other states. Maryland ranks in the top 10 for three of the eight practices tracked in this report, and ranks above the median for the rest. The percentage of Maryland's farms and farmland on which these practices are implemented are higher than the national averages for half of these practices, and are in line with national averages on the rest.

	State Rank	State Percentage	National Percentage
Economic Sustainability			
Produced and sold value-added commodities (Farms)	15	5.3	3.4
Generated energy or electricity (Farms)	22	1.0	1.1
Marketed products through community supported agriculture (CSA) (Farms)	9	1.3	0.6
Sold products directly to consumers for human consumption (Farms)	15	11.0	6.2
Environmental Sustainability			
Used conservation farming methods (Farms)	4	40.6	22.9
Used organic farming methods (Acres)	20	0.3	0.3
Land being converted to organic production (Acres)	*15*	*0.1*	*0.1*
Land enrolled in Federal conservation programs (Acres)	15	4.1	4.2
Social/Cultural Sustainability			
Had a barn built prior to 1960 (Farms)	6	40.7	30.1

Economic Sustainability

The 2007 Agricultural Census contains multiple indicators of economic sustainability for farms and farmland. Economically sustainable practices allow farms to produce goods profitably enough to ensure that they remain viable businesses that will be able to continue to exist into the future. Because of the interdependent nature of sustainable practices, the economic sustainability indicators below may also have environmental and social/cultural aspects. If the preservation of farms and farm culture is considered to be a part of social/cultural sustainability, then in a sense all economic sustainability activities support social/cultural sustainability as well.

Produced and Sold Value-Added Commodities

The 2007 Agricultural Census tracks farms that produce and sell their own value-added commodities. The USDA defines value-added as "the incremental value that is realized by the producer from an agricultural commodity or product as the result of a change in its physical state, differentiated production or marketing, as demonstrated in a business plan, or Product segregation."[3] Examples of value-added commodities

[3] 7 CFR PART 4284 – GRANTS, Subpart A – General Requirements for Cooperative Services Grant Programs, Section 4284.3 – Definitions. http://www.rurdev.usda.gov/regs/regs/pdf/4284a.pdf

include “milling wheat into flour, slaughtering livestock or poultry, making strawberries into jam, the marketing of organic products, an identity preserved marketing system, wind or hydro power produced on land that is farmed and collecting and converting methane from animal waste to generate energy.”[4]

Supporting the expansion of farm business into value-added commodities is the focus of legislation in 2002 that established a federal Value-Added Producer Grants Program (USDA VAPG), and Maryland followed soon after with its own Maryland Value Added Producer Grant Program (MVAPG) through the quasi-public Maryland Agricultural & Resource-Based Industry Development Corporation (MARBIDCO). This was in response to dwindling farm revenues across the U.S. and a shift of agri-business sector income from farms to processors. According to the Congressional Research Service, “from 1910 to 1990, farmers' share of the overall GDP of the food and fiber system fell from 21% to 5%, while the share contributed by the agricultural input and distribution subsectors rose from 13% to 30%.”[5]

The trend towards individual farms creating their own value-added commodities is a shift in past beliefs that the best way to grow farm revenues is to increase farm size, a strategy whose effectiveness has been inconclusive.[6] While the production of value-added commodities is not a panacea and can introduce additional risk into farm operations by “entrench[ing] the producer in the supply chain” rather than reducing risks through diversification,[7] when done properly it can significantly increase farm revenues.[8]

In 2007, 5.3 percent (683 out of 12,834 farms) in Maryland were producing value-added commodities, versus 3.4 percent nationally. This ranked Maryland 15th out of the 50 states in percentage of farms, and 37th in number of farms. Percentage-wise, the six New England states occupied the top six positions, with New Hampshire ranked first at 9.7 percent of all farms. Numerically, while the percentage of farms producing value-added commodities in Texas was below the national average (3.2%), it had by far the largest number of farms (7,865 out of 247,437 farms), more than twice as many as second-ranked Missouri (3,505 out of 107,825 farms, or 3.3%) (See **Table 1**).

Within Maryland, the Washington Suburban Region had the highest percentage of farms engaged in value-added production (6.8%, or 161 out of 2,378 farms), while the Baltimore Metro Region had the largest number (209 out of 3,315, or 6.3%). By jurisdiction, Howard County had the highest percentage of farms involved in value-added production (9.9%, or 33 out of 335), while Frederick County had the largest number (87 out of 1,442, or 6.0%) (See **Table 2**).

Generated Energy or Electricity

While the USDA considers on-farm energy generation to be a part of value-added production, the 2007 Agricultural Census tracks this statistic separately. In 2007, 1.0 percent (131 out of 12,834 farms) in

[4] Ibid.

[5] Congressional Research Service. October 2002. “Value-Added Agricultural Enterprises in Rural Development Strategies,” http://hdl.handle.net/10207/1523

[6] Vincent Amanor-Boadu, PhD. “Preparing for Agricultural Value-Adding Business Initiative: First Things First”

[7] Ibid.

[8] “Oregon State University economists studying 2005 data found that value added to $4.1 billion in crop and livestock sales (farmgate sales) generated another $2.1 billion in first-handler economic activity, a 53 percent increase over the value of farmgate sales alone.” http://extension.oregonstate.edu/news/story.php?S_No=478&storyType=news

Maryland were generating their own energy, versus 1.1 percent nationally. As compared to other states, Maryland ranked 22nd in the percentage of and 44th in the number of farms generating energy. First was Hawaii, with 10.7 percent of all farms generating energy, with Alaska ranked second with 5.1 percent. California has the largest number of farms generating energy (3,230, ranking it third in percentage terms at 4.0%), followed by Texas (2,300 farms, or 0.9%) (See **Table 1**).

Within Maryland, the Washington Suburban Region had the highest percentage of farms generating energy or electricity (1.4%, or 34 out of 2,378 farms), while the Baltimore Metro Region had the largest number (40 out of 3,315, or 1.2%). By jurisdiction, Prince George's County had the highest percentage of farms involved in energy generation (1.6%, or 6 out of 375), while Frederick County had the largest number (16 out of 1,442, or 1.1%) (See **Table 2**).

Marketed Products through Community Supported Agriculture (CSA)

Similar to creating value-added commodities, participating in Community Supported Agriculture (CSA) allows more of the profits from farm products to accrue directly to farms. According to the USDA, "CSA consists of a community of individuals who pledge support to a farm operation so that the farmland becomes, either legally or spiritually, the community's farm, with the growers and consumers providing mutual support and sharing the risks and benefits of food production . . . By direct sales to community members, who have provided the farmer with working capital in advance, growers receive better prices for their crops, gain some financial security, and are relieved of much of the burden of marketing."[9] Many CSA farms "typically use organic or biodynamic farming methods, and strive to provide fresh, high-quality foods."[10] More so than the other practices listed here, CSA cuts across all three aspects of sustainability: Economic (through the mitigation of financial risk); environmental (by supporting local agriculture and organic practices); and social/cultural (by creating stronger community ties).

In 2007, 1.3 percent (161 out of 12,834 farms) in Maryland were marketing products through CSA, versus 0.6 percent nationally. Nationally, Maryland ranked 9th in the percentage of and 31st in the number of farms participating in Community Supported Agriculture. First was Alaska, with 2.9 percent of all farms marketing through CSA, with the six New England states holding the second through seventh positions (with Massachusetts second and Maine seventh), and Hawaii ranking 8th at 1.8 percent. California had the largest number of farms involved in CSA (953, ranking it tenth in percentage terms at 1.2%), followed by Texas (883 farms, or 0.4%) (See **Table 1**).

Within Maryland, the Baltimore Metro Region had the highest percentage of farms participating in CSA (1.8%, or 61 out of 3,315 farms), while the Washington Suburban Region had the largest number (35 out of 2,378, or 1.5%). By jurisdiction, Montgomery County had the highest percentage of farms involved in CSA (2.7%, or 15 out of 561), while Carroll County had the largest number (20 out of 1,148, or 1.7%) (See **Table 2**).

[9] S DeMuth, 1993 "Defining Community Supported Agriculture," http://www.nal.usda.gov/afsic/pubs/csa/csadef.shtml

[10] Ibid.

Sold Products Directly to Consumers for Human Consumption[11]

Over the last 100 years, household expenditures on prepared food have gone from less than 10 percent to over 50 percent of all food expenditures, and total food expenditures as a percentage of total GDP have decreased. This has put pressure on farm profits, making it more difficult for farms to remain profitable. Studies have shown and shows that closer farmers are to the consumer, the higher share of the consumer's dollar they will capture.[12] One way to do this is to sell farm products directly to the consumer and to capture the profits that would normally go to distributors or processors.

Farm products sold "directly to individuals for human consumption" are sold through "roadside stands, farmers' markets, pick-your-own sites," and similar venues.[13] Only edible food items are counted, be they plant or animal products. Unlike CSA, this variable does not cover sales to farm members or subscribers. Like CSA and value-added activities, it is an attempt to reduce the distance between farms and consumers.

Nationwide in 2007, 6.2 percent of all farms sold products for human consumption directly to consumers, as compared to 5.5 percent in 2002. In Maryland, 11.0 percent of farms (1,407 of 12,834) had direct sales, an increase of 1.4 percent over 2002. In 2002 and 2007, Maryland ranked 15th in the percentage of farms involved in direct sales. In 2007, New Hampshire ranked first with 23.7 percent of all farms selling directly to consumers, with the balance of the six New England states and Alaska (ranked 3rd) holding the second through seventh positions, all having percentages of farms selling directly to consumers above 20 percent. Texas had the largest number of farms (8,619 farms, or 3.5%) and Pennsylvania had the second largest number (7,537, ranking it 13th in percentage terms at 11.9%) (See **Table 3**).

Within Maryland, the Baltimore Metro Region had the highest number of farms that sold products directly to consumers in 2007 (14.2%, or 472 out of 3,315 farms), while the Southern Maryland Region had the largest percentage (14.5%, or 191 out of 1,313 farms). By jurisdiction, Prince George's County had the highest percentage of farms selling directly to consumers (17.1%, or 64 out of 375 farms), while Frederick County had the largest number (158 out of 1,442 farms, or 11.0%) (See **Table 4**).

In 2007 the value of sales to individual consumers was a small percentage of total farm sales. Nationwide, only 0.4 percent of all farm sales by value were made directly to consumers in both 2002 and 2007. In Maryland, that percentage was 1.0 percent in 2002 ($12.1 million out of $1.3 billion in inflation-adjusted sales[14]), increasing to 1.2 percent in 2007 ($18.0 million out of 1.6 billion). On average, each of the farms in Maryland selling directly to consumers sold $12,814 worth of goods in 2007, up from $10,378 in 2002, a 23.5% increase (See **Table 3**).

Within Maryland, the Southern Maryland Region had the highest percentage of sales of products directly to consumers in 2007 (4.5%, or $1.1 million out of $24.6 million in sales), while the Washington Suburban Region had the largest amount of sales ($5.6 million out of $152 million, or 3.7%). By jurisdiction, Frederick

[11] Referred to as "value of agricultural products sold directly to individuals for human consumption" in the 2007 Agricultural Census.

[12] Vincent Amanor-Boadu, PhD. "Preparing for Agricultural Value-Adding Business Initiative: First Things First"

[13] USDA definition, 2007 Agricultural Census.

[14] All monetary values in this report are adjusted for inflation to Year 2000 dollars.

County had both the highest percentage of total sales and the highest dollar amount of sales of goods sold directly to consumers (9.5%, or $2.7 million out of $28.2 million in sales). (See **Table 4**).

Environmental Sustainability

Environmentally sustainable practices help farmers to protect the future viability of farmland and its surrounding ecosystems. An important component of environmentally sustainable farmland is the protection of soil from erosion, which has traditionally been accomplished through conservation farming methods, which have been joined more and more by organic farming methods, both of which are effective in stopping soil erosion. Both of these practices are tracked by the Agricultural Census in 2007. Also tracked are programs that remove environmentally sensitive farmland from production and manage it in ways that benefit the surrounding ecosystem. Because of the interdependent nature of sustainable practices, these indicators may also have economic and social/cultural aspects.

Used Conservation Farming Methods

Conservation farming methods are an important part of environmental and economic sustainability for many farms and farming regions. Conservation farming methods generally refer to methods that protect soils from erosion, such as no-till farming. According to recent studies, "the United States is losing soil 10 times faster" than nature's ability to restore it, and about 60 percent of this eroded soil "ends up in rivers, streams and lakes, making waterways more prone to flooding and to contamination from soil's fertilizers and pesticides," a major issue in protecting the health of Maryland's many waterways and the Chesapeake Bay. Soil erosion also has a high economic impact, costing the U.S. an estimated $37.6 billion each year in productivity losses. "Erosion promotes critical losses of water, nutrients, soil organic matter and soil biota, harming forests, rangeland and natural ecosystems." [15]

Nationally, 22.9 percent of farms used conservation farming methods in 2007. In Maryland, 40.6 percent (5,211 out of 12,834 farms) used these methods, ranking it 4th out of the 50 states. Numerically, Maryland ranked 31st. Iowa had the highest ranking both in percentage terms and numerically, with 44.5 percent (41,350) of all farms using conservation farming methods. Within Maryland, the Upper Eastern Shore region contained the highest percentage of farms using conservation farming methods (49.9%, or 1,177 out of 2,360 farms) while the Baltimore Region had the highest number (1,365 out of 3,315, or 41.2%). (See **Table 2**).

Used Organic Farming Methods

Similar to conservation farming methods, organic farming methods can help preserve topsoil and control the runoff of fertilizers and pesticides. In addition, organic methods can protect soil from compaction, preserving its ability to absorb rainfall and help to prevent flooding. Organic produce can also add to the value of products sold by farm operations, increasing profits, as well as reducing costs for artificial fertilizer and pesticides. However, organics can also have lower yields depending on the type of crop grown, and organic methods are not a panacea for protecting environmental quality, as they can still rely on pesticide and natural fertilizer applications than can negatively affect the environment. To qualify for organic

[15] Soil Erosion Threatens Environment and Human Health, http://www.sciencedaily.com/releases/2006/03/060322141021.htm

production, farmland needs to be farmed without fertilizers or pesticides for a specified period of time. This means that farmers need to utilize organic farming methods for years before they can claim any market advantage from them, though they will accrue money savings from reducing pesticide and fertilizer use over that time period. Overall, when pursued properly organic farming methods can have a positive environmental impact. Note that organic production and farmland are self-reported by farms and were not verified by the USDA for the Census, and that data on organic production from the 2007 Census is not comparable to the 2002 Census.

Nationally, 0.9 percent of farms and 0.3 percent of farmland were used for organic production in 2007. Of all land in organic production, half produced organic crops, while 37.8 percent was used as organic pastureland.[16] In Maryland, 1.3 percent (161 out of 12,834 farms) produced organic products on 0.3 percent of farm acreage (6,678 out of 2 million acres), ranking it 17th and 20th in the nation, respectively. Fully 62.3 percent of land in organic production in Maryland was in crop production (or 4,161 out of 6,678 acres), while 24.5 percent (1,637 acres) was in organic pastureland. Vermont ranked first in the percentage of farms (8.9%) and farmland (5.5%) involved in organic production, while California ranked first in both the number of farms (3,515, ranking 5th in percentage terms) and in acres (368,934 acres, ranking 4th) of farmland. (See **Table 5**).

In the nation as a whole, 0.1 percent of farmland (616,358 acres) on 0.5 percent of farms was in the process of being converted to organic production. In Maryland, this figure was also 0.1 percent for farmland (2,383 out of 2.05 million acres), which ranked the state 15th in terms of percentage and 37th in terms of number of acres under conversion, on 107 (0.8%) of farms. First in percentage terms for land conversion was Vermont, with 0.6 percent of all acres under conversion, while Hawaii was first in percentage of farms (2.8%). Numerically, Texas was first in the number of acres (63,932), while California was first in the number of farms (1,399). (See **Table 5**).

Within Maryland, the Washington Suburban Region had the largest percentage and number of farms with organic production. By jurisdiction, Frederick County had the largest number of farms (30 out of 1,442, or 2.1%), while Kent County had the largest percentage (3.7%, or 14 out of 377). The Washington Suburban Region also had the largest percentage and number of farms converting farmland to organic use (1.3%, or 30 farms), while Washington County had the largest number (18 out of 844, or 2.1%) and Kent County had the largest percentage (3.4%, or 13 farms) out of Maryland's jurisdictions. (See **Table 6**).

Land Enrolled in Conservation Programs

The USDA has established multiple programs to protect environmentally sensitive lands. The largest is the Conservation Reserve Program (CRP), which was established in 1985. Is program gives an annual rental payment to farms for taking "land prone to erosion out of production" and "carrying out approved conservation practices" on that land for a specified period from 10 to 15 years. The Wetlands Reserve Program (WRP), Farmable Wetlands Program (FWP), and Conservation Reserve Enhancement Program (CREP) are all similar programs dedicated to preserving environmentally sensitive lands by offering "landowners financial incentives for conservation practices," and are all included in this statistic. Note that,

[16] The 2007 Agricultural Census does not specify the use for organic production lands not used for crop production or pastureland. The 12.6 percent of land that is not classified is assumed to be fallow cropland.

for the 2007 Census, all operations that received $1,000 or more in payments under these programs were counted as farms whether or not they met the threshold of $1,000 in agricultural product sales. Because not all of these programs were included in the 2002 Census, this statistic is not comparable to previous years.[17]

Nationwide, there were 38.6 million acres of farmland (4.2%) in 346,231 farms (15.7%) enrolled in these programs in 2007. In Maryland, 85,406 acres of land (4.1%) in 2,525 farms (19.7%) were enrolled in conservation programs. This ranked Maryland 15th out of the 50 states in acres of conserved farmland and 12th in the number of farms participating in these programs. Washington State had the highest percentage of farmland enrolled in these programs in 2007 (10.7%), though it ranked 24th in the number of farms participating. Not surprisingly, Texas has the largest amount of acres enrolled (4.2 million). North Dakota had the largest percentage of enrolled farms (47.7%), while Iowa had the largest number (40,502) and second-largest percentage (43.6%) (See **Table 1**).

Within Maryland, the Lower Eastern Shore had the largest percentage and amount of farmland enrolled in conservation programs (28,317 acres, or 7.1%). By jurisdiction, Somerset County had the highest percentage of land enrolled (8.7%), while Queen Anne's County had the largest amount of farmland enrolled (10,059 acres) (See **Table 2**).

Social and Cultural Sustainability

It could be argued that any practice that improves economic or environmental sustainability for farming operations is also supporting social/cultural sustainability, as it is protecting farming culture and the areas that depend upon it. However, there are also sustainability efforts that are aimed at promoting and conserving social and cultural institutions related to farming, such as historic preservation of farming-related structures. While the Agricultural Census is not designed to measure social sustainability factors, it does ask farmers to identify whether or not they have barns on their properties built before 1960. This data points to areas that may have structures that are historically significant and would merit preservation.

Had a barn built prior to 1960

Nationally, 30.1 percent of all farms had barns built before 1960, meaning that (as of the date of the Census' publication) they were built at least 50 years ago, making them chronologically eligible for placement on the National Register of Historic Places.[18] In Maryland, 40.7 percent (5,219 out of 12,834 farms) had barns built before 1970, ranking it 6th in percentage and 33rd in number of farms. First in percentage terms was New York State, with 48.2 percent of all farms having barns built before 1960, while Texas had the largest number of farms with 50+ year old barn structures (51,236) (See **Table 1**).

[17] These efforts are in addition to efforts by the State of Maryland to preserve farmland. Maryland has created for itself "a farmland preservation goal of 1,030,000 [acres] to be placed under easement through three programs combined: The Maryland Agricultural Land Preservation Foundation, Rural Legacy, and Local Purchase/Transfer of Development Rights Programs." By 2008, "these three programs [had] preserved over 480,640 acres…a little less than half of the goal." http://www.agprint.maryland.gov/

[18] http://www.nps.gov/history/nr/listing.htm

Within Maryland, the Western Maryland Region had the largest percentage of farms with older barns (48.7%, or 888 out of 1,823) while the Baltimore Region had the largest number (1,565 out of 3,315, or 47.2%). By jurisdiction, Carroll County had by far the highest percentage (53.6%, or 615 out of 1,148 farms), while Frederick County had the largest number (723 out of 1,442, or 50.1%) (See **Table 2**).

About the Census of Agriculture

The Census of Agriculture is conducted every five years by the National Agricultural Statistics Service (NASS), a branch of the United States Department of Agriculture (USDA). NASS has conducted the Census since 1997. Previously, the Census was conducted by the U.S. Bureau of the Census. In one form or another, there has been an agricultural census conducted periodically in the U.S. since 1840.

According to NASS, the Census of Agriculture "is a complete count of U.S. farms and ranches and the people who operate them. The Census looks at land use and ownership, operator characteristics, production practices, income and expenditures and many other areas."[19] Data is published for the nation, states, certain territories, and all U.S. counties.

Farm Definitions

The USDA defines a farm as any place from which $1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the relevant census year.[20] This definition has changed nine times since 1840. From 1959 to 1974, the definition included both farm size and sales volume, with two different sales volume thresholds based on two farm size classifications (farms of 10 acres or more and farms of less than 10 acres). The current definition was adopted after 1974 and has no farm size requirement. Inflation has changed the definition over time, as the table below shows.

	Current Dollars			Constant Dollars ($2000) *		
Year	10 Acres+	Less than 10 Acres	All Acres	10 Acres+	Less than 10 Acres	All Acres
2007			$1,000			$850
2002			$1,000			$966
1997			$1,000			$1,051
1992			$1,000			$1,165
1987			$1,000			$1,410
1982			$1,000			$1,671
1978			$1,000			$2,312
1974	$50	$250		$151	$753	
1969	$50	$250		$198	$990	
1964	$50	$250		$230	$1,148	
1959	$50	$250		$245	$1,224	

* Dollar values adjusted using the Personal Consumption Expenditure (PCE)index from the Bureau of Economic Analysis' National Income and Products Accounts System (NIPA)

Source: 2002 Census of Agriculture: History, Appendix B

[19] http://www.agcensus.usda.gov/Help/FAQs/General_FAQs/index1.asp

[20] http://www.agcensus.usda.gov/Publications/2007/Full_Report/usv1.pdf