

**U.S. Organic Farming Emerges in the 1990s: Adoption of Certified Systems.** By Catherine R. Greene, U.S. Department of Agriculture, Economic Research Service, Resource Economics Division, Agriculture Information Bulletin No. 770.

## **Abstract**

Farmers have been developing organic farming systems in the United States for decades. State and private institutions also began emerging during this period to set organic farming standards and provide third-party verification of label claims, and legislation requiring national standards was passed in the 1990s. More U.S. producers are considering organic farming systems in order to lower input costs, conserve nonrenewable resources, capture high-value markets, and boost farm income. Organic farming systems rely on practices such as cultural and biological pest management, and virtually prohibit synthetic chemicals in crop production and antibiotics or hormones in livestock production. This report updates U.S. Department of Agriculture (USDA) estimates of land farmed with organic practices during 1992-94 with 1997 estimates, and provides new State- and crop-level detail.

**Keywords:** organic farming systems, organic certification, certified organic acreage and livestock, price premiums, national organic rules, specialty agriculture, high-value crops, farmers' markets.

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## Summary

The amount of U.S. farmland managed under certified organic farming systems expanded substantially during the 1990s, as did consumer demand for organically grown food. More U.S. producers are considering organic farming systems in order to lower input costs and conserve nonrenewable resources, as well as to capture high-value markets and improve farm income. Organic farming systems foster the cycling of resources, rely on practices such as cultural and biological pest management, and virtually prohibit synthetic chemicals in crop production and antibiotics or hormones in livestock production.

Regulation of the organic food industry—which began several decades ago when private organizations began developing standards and third-party certification to support organic farming and thwart consumer fraud—also evolved rapidly during the 1990s. By the mid-1990s, over half the States had laws or rules regulating the production and marketing of organically grown food and fiber, and Congress had passed legislation requiring that national standards be set. The U.S. Department of Agriculture (USDA) published the final rule implementing this legislation in December 2000, and by late-2002, all except the smallest organic growers will have to be certified by a State or private agency accredited under these national standards.

This report updates USDA estimates of land farmed with certified organic practices during 1992-94 with 1997 estimates, and provides new State- and crop-level detail. The procedures used in this report are similar to those used in the first study of certified acreage: data from State and private certifiers were collected and analyzed, uncertified production was excluded, and double-certified acreage was excluded whenever possible. Forty organic certification organizations—12 State and 28 private—conducted third-party certification of organic production in 1997.

Certified organic farming systems were used on 1.35 million acres of cropland and pasture in 49 States in 1997. U.S. certified organic cropland more than doubled between 1992 and 1997, and two organic livestock sectors—eggs and dairy—grew even faster. However, the organic sector is still of modest size because of the low starting base. Also, the percentage increase in the number of certified organic growers between 1995 and 1997 was much less than the increase in farmland certified. Many existing organic farmers expanded their operations, and a number of new large-scale operations became certified.

The structure of the organic sector differs substantially from the agriculture industry as a whole, with fruits, vegetables and other high-value specialty crops making up a much larger proportion of this sector. About 2 percent of top specialty crops—lettuce, carrots, grapes, and apples—were grown under certified organic farming systems in 1997, while only 0.1 percent of the top U.S. field crops—corn and soybeans—were certified organic. Also, organic field crop producers grow a greater diversity of crops than their conventional counterparts because of the key role that crop rotation plays in organic pest and nutrient management. At least 1 percent of the oat, spelt (37 percent), millet, buckwheat (30 percent), rye, flax, and dry pea crops were under organic management. While some large-scale organic farms emerged during the 1990s, small farms producing “mixed vegetable” crops for marketing direct to consumers and restaurants still made up a large segment of the organic sector in 1997.

Government policy in the United States has focused primarily on developing national certification standards to assure consumers that organic commodities meet a consistent standard and to facilitate interstate and international commerce. However, several States have begun subsidizing conversion to organic farming systems as a way to capture the environmental benefits of these systems. Potential benefits from organic farming systems include improved soil tilth and productivity, lower energy use, and reduced use of pesticides, which can cause acute and chronic illness in humans as well as damage to fish and wildlife. Most European countries have been providing direct financial support for conversion since the late 1980s, with conversion levels much higher than in the United States.

Obstacles to adoption include large managerial costs and risks of shifting to a new way of farming, limited awareness of organic farming systems, lack of marketing and technical infrastructure, and inability to capture marketing economies. State and private certifier fees for inspections, pesticide residue testing, and other services represent an added expense for organic producers. And farmers cannot command certified organic price premiums during the 3-year required conversion period before crops and livestock can be certified as organic, although a few organic buyers offer a smaller premium for crops from land that is under conversion.

Strong market signals for organically produced agricultural goods, along with growing public and private support for organic farming systems, make it likely that organic production will remain a fast-growing segment of U.S. agriculture. Although government involvement in the United States has focused primarily on developing national certification standards, USDA has recently begun several small organic programs, including export promotion, farming systems trials, and a pilot program to provide financial assistance for certification costs.

# U.S. Organic Farming Emerges in the 1990s

## Adoption of Certified Systems

Catherine R. Greene

### Introduction

Organic agriculture was a small but fast-growing segment of U.S. agriculture during the 1990s. The range of organically grown food available in supermarkets and natural food stores has widened substantially—milk, eggs, dairy, pasta, and frozen dinners are now available along with produce—and consumer demand for organically grown food has increased 20 percent or more annually since the late 1980s (Emerich, 1995). More U.S. producers are considering organic farming systems as a way to potentially lower input costs, decrease reliance on nonrenewable resources, capture high-value markets and premium prices, and boost farm income. This study updates U.S. Department of Agriculture (USDA) estimates of land farmed with organic practices during 1992-94 with 1997 estimates, and provides new State- and crop-level detail.

Farmers worldwide have been developing organic farming systems for decades. Government intervention in the United States has focused primarily on developing national certification standards to assure consumers that organic commodities meet a consistent standard and to facilitate interstate and international commerce. Also, several States have begun subsidizing conversion to organic farming systems as a way to capture the environmental benefits of these systems (Planck, 1999; DeWitt, 1999). Most European countries have been providing direct financial support for conversion since the late 1980s, with conversion levels much higher than in the United States.

Along with the rapid growth in organic foods during the 1990s, regulation of organic food production and labeling has been evolving. By the mid-1990s, over half the States had laws or rules regulating the produc-

tion and marketing of organically grown food and fiber. Many States require third-party certification to ensure that farmers adhere to organic production standards, and many organic brokers and wholesalers require certification as well. Congress passed the Organic Foods Production Act of 1990, Title XXI of the Food, Agriculture, Conservation and Trade Act of 1990, in order to establish national standards for organically produced commodities. USDA published the final rule implementing this legislation on December 21, 2000 (U.S. Department of Agriculture, 2001). By mid-2002, all except the smallest organic growers, those with \$5,000 or less annually in organic sales, will have to be certified by a State or private agency accredited under these national standards.

Forty organic certification organizations—12 State and 28 private—conducted third-party certification of organic production in 1997. Additionally, some certification organizations provided certification services only to processors in 1997, and others were in the process of setting up a certification program. Most certifiers are expected to seek accreditation by USDA.

### Organic Farming Systems

Organic farming systems rely on ecologically based practices such as cultural and biological pest management, and virtually exclude the use of synthetic chemicals in crop production and prohibit the use of antibiotics and hormones in livestock production. Under organic farming systems, the fundamental components and natural processes of ecosystems—such as soil organism activities, nutrient cycling, and species distribution and competition—are incorporated directly and indirectly as crop management tools (Thomas and Kevan, 1993; Kevan, Thomas, and Belaoussoff, 1997).

For example, habitat needs for food and shelter are provided for the predators and parasites of crop pests, planting and harvesting dates are carefully planned and crops rotated, and animal and green manures are cycled in organic production systems.

Organic livestock production systems attempt to accommodate an animal's natural nutritional and behavioral requirements. Livestock standards address the origin of each animal and incorporate requirements for living conditions, pasture and access to the outdoors, feed ration, and health care practices suitable to the needs of the particular species.

In USDA's final rule, organic production is defined as, "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."

A number of case studies have examined the yields, input costs, income, profitability, and other economic characteristics of organic production. A 1990 review of the U.S. literature concluded that the "variation within organic and conventional farming systems is likely as large as the differences between the two systems," and found mixed results in the comparisons for most characteristics (Knoblauch, Brown, and Braster, 1990).

Several more recent U.S. studies have indicated that organic price premiums are key in giving organic farming systems comparable or higher whole-farm profits than conventional chemical-intensive systems, particularly for crops like processed tomatoes and cotton (Klonsky and Livingston, 1994; Batte, Forster, and Hitzhusen, 1993; Imhoff; Assadian, Esparza, and Ponce, 1999). Other studies have found that organic systems may be more profitable than conventional systems, even without price premiums. For example, some Midwestern organic grain and soybean production was found to be more profitable than conventional systems, even without price premiums, due to higher yields in drier areas or periods, lower input costs, or crop mix (Welsh, 1999). Also, a recent study comparing organic and conventional apple production in California's Central Coast showed higher yields as

well as higher returns under the organic systems (Swezey et al., 1994).

Some of the cultural, biological, and mechanical practices used in organic systems may be more expensive, less effective, or more management-intensive than use of chemical fertilizers and pesticides, but could be economically justified if their environmental benefits are acknowledged. Pesticides have been shown to cause acute and chronic illness in humans, especially with occupational exposure, and to damage fish and wildlife, including species that are beneficial in agricultural ecosystems (U.S. EPA, 1987; Alavanja et al., 1996; Alavanja et al., 1993, Litovitz et al., 1990; Buchman and Nabhan, 1996). Reduced nutrient pollution, improved soil tilth and productivity, and lower energy use have been documented for organic farming systems (USDA, 1980; Smolik et al., 1993). Soils in organic farming systems (which use cover crops, crop rotations, and animal and green manure) may also sequester as much carbon as soils under other carbon sequestration strategies, and could help reduce global warming (Lal et al., 1998; Drinkwater, Wagoner, and Sarrantonio, 1998).

Obstacles to adoption include large managerial costs and risks of shifting to a new way of farming, limited awareness of organic farming systems, lack of marketing and technical infrastructure, and inability to capture marketing economies (Dobbs et al., 1999b; Lohr and Salomonsson, 1998). State and private certifier fees for inspections, pesticide residue testing, and other services represent an added expense for organic producers. And farmers cannot command certified organic price premiums during the 3-year required conversion period before crops and livestock can be certified as organic, although a few organic buyers offer a smaller premium for crops from land that is under conversion.

## Organic Demand and Pricing

Consumer demand for organically produced food grew rapidly in the 1990s, and has been reflected in premium prices and large increases in organic food sales through conventional and natural foodstores and other market outlets. Industry statistics indicate that organic sales through natural foodstores, the largest outlet for organic foods, increased by 20 percent annually since

the late 1980s (Emerich, 1995). Organic food sales in 1997 accounted for 1 to 2 percent of total food sales in the United States and other major world markets for these goods, including Japan, Denmark, France, Germany, Italy, the Netherlands, Switzerland, and the U.K. (International Trade Centre UNCTAD/WTO, 1999). Medium-term growth forecasts range from 5-10 percent annually for Germany to 20-30 percent for the United States and 30-40 percent for Denmark (International Trade Centre UNCTAD/WTO, 1999).

Price data collected by private and nonprofit organizations have indicated substantial organic premiums for fruits, vegetables, and milk over the last decade. USDA tracked wholesale organic price premiums for two vegetables between 1989 and 1992—based on a price report published by the nonprofit Community Alliance for Family Farmers—and found annual average prices that were generally double conventional prices, with wide variation on a weekly basis (Economic Research Service, 1989-92). Monthly farmgate price premiums for several major fruits and vegetables consistently exceeded 100 percent between 1992 and 1996, based on reports from the Organic Food Business News (OFBN) published by a private firm (Vandeman, 1998). Supermarket scanner data showed similar results for frozen vegetables during this period (Glaser et al., 1998), as well as a 60-percent premium for organic milk over conventional milk brands from 1997 to 1999 (Thompson and Glaser, 2000).

Organic grain and soybean crops also enjoyed substantial price premiums during the 1990s, exceeding 50 percent for corn, soybeans, wheat, and oats during 1993-99 (Dobbs, 1998 and 1999a). Researchers have also calculated price premiums of about 34 percent at the retail level for clothing made from organically grown cotton, based on 1996 catalog data (Nimon and Beghin, 1999).

About a third of the U.S. population currently buys some organically grown foods, according to a 1999 nationwide survey of over 26,000 consumers, with vegetables, fruits, and cereal/grains the top three organic product groups (Hartman Group, 2000). This study also found that another 60 percent of the U.S. population would be willing to try organic products. Consumer surveys during the 1990s found organic food shoppers generally as concerned about environmental protection as about personal safety (Bruhn et

al., 1992; Weaver, Evans, and Luloff, 1992; Cuperus et al., 1996; Goldman and Clancy, 1991). Consumer surveys also show that a majority of consumers are willing to pay some premium for organically grown foods (Govindasamy and Italia, 1997). Product availability limits many consumers. A recent study of food retailers in Atlanta, Georgia, indicates that organic education programs can motivate more retailers to offer organic foods (Lohr and Semali, 2000).

## Third-Party Certification and Labels

Private organizations began to provide organic certification services in the early 1970's, with the oldest U.S. certifier, California Certified Organic Farmers, dating back to 1972. The private organizations that offer certification services are mostly nonprofit. State certification programs began developing in the late 1980's, and are run mostly through State agriculture departments. The organic programs that currently certify growers are expected to seek accreditation by USDA when the national program is implemented.<sup>1</sup>

All of the State and private certification programs active in 1997 have developed a set of standards for certifying organic crop production—many follow the standards outlined in the Organic Foods Production Act of 1990—and nearly half of these certifiers make their standards available on the Internet (table 1). Sixteen of the certifiers active in 1997 have also developed livestock production standards and provide livestock certification services (table 2). Although both the crop and livestock standards used by State and private certifiers overlap in many aspects, differences remain in some areas.

The fees charged by State and private certifiers—which may include membership fees, inspection fees, and pesticide residue testing fees—represent an ongoing production expense in certified organic farming systems. Also, most certifiers require a 3-year transition (conversion) period before certifying crop acreage

<sup>1</sup> The National Organic Program (NOP) in USDA's Agricultural Marketing Service is implementing the Federal legislation on national organic standards, and information about the status of the program is available at [www.ams.usda.gov/nop/](http://www.ams.usda.gov/nop/)

**Table 1—U.S. organic certification program websites<sup>1</sup>**

Certifier	Organic program website	Certification standards online
<b>State</b>		
Colorado Dept. of Agriculture	<a href="http://www.ag.state.co.us/DPI/programs/programs.html">www.ag.state.co.us/DPI/programs/programs.html</a>	yes
Idaho Dept. of Agriculture	<a href="http://www.agri.state.id.us/AgInspectWeb/organic/index.htm#1">www.agri.state.id.us/AgInspectWeb/organic/index.htm#1</a>	no
Kentucky Dept. of Agriculture	<a href="http://www.state.ky.us/agencies/agr/Organic/index.html">www.state.ky.us/agencies/agr/Organic/index.html</a>	yes
Louisiana Dept. of Agriculture and Forestry	--	no
Maryland Dept. of Agriculture	--	no
New Hampshire Dept. of Agriculture	<a href="http://www.state.nh.us/agric/mark.html">www.state.nh.us/agric/mark.html</a>	yes
New Mexico Organic Commodity Commission	--	no
Oklahoma Dept. of Agriculture	--	no
Rhode Island Dept. of Environmental Management	<a href="http://users.ids.net/~nofari/">http://users.ids.net/~nofari/</a>	yes
Texas Dept. of Agriculture	<a href="http://www.agr.state.tx.us/license/regprograms1.html">www.agr.state.tx.us/license/regprograms1.html</a>	no
Virginia Dept. of Agriculture & Consumer Services	<a href="http://www.vvac.org/bgvp/vaorg/op.html">www.vvac.org/bgvp/vaorg/op.html</a>	yes
Washington State Department of Agriculture	<a href="http://www.wa.gov/agr/fsah/organic/ofp.htm">http://www.wa.gov/agr/fsah/organic/ofp.htm</a>	yes
<b>Private</b>		
California Certified Organic Farmers	<a href="http://www.ccof.org">www.ccof.org</a>	yes
Carolina Farm Stewardship Assn.	<a href="http://www.carolinafarmstewards.org/">www.carolinafarmstewards.org/</a>	yes
Demeter Assn.	<a href="http://www.demeter-usa.org/">www.demeter-usa.org/</a>	no
Farm Verified Organic, Inc.	<a href="http://www.ics-intl.com/fvo.html">www.ics-intl.com/fvo.html</a>	no
Florida Certified Organic Growers & Consumers	<a href="http://www.floridaplants.com/FOG/">www.floridaplants.com/FOG/</a>	no
Georgia Organic Growers Assn.	<a href="http://www.pd.org/~glsa/">www.pd.org/~glsa/</a>	no
Hawaii Bio-Organic Growers Assn.	<a href="http://www.humic.com/HBOGA.html">www.humic.com/HBOGA.html</a>	yes
Hawaii Kauai Organic Growers Assn.	--	no
Hawaii Organic Farmers Assn.	<a href="http://www.hawaiiorganicfarmers.org/">http://www.hawaiiorganicfarmers.org/</a>	no
Indiana Certified Organic	--	no
Maine Organic Farmers & Gardeners Assn.	<a href="http://www.mofga.org/">www.mofga.org/</a>	yes
Mountain State Organic Growers & Buyers Assn.	<a href="http://www.wvu.edu/~agexten/org&amp;agny/msogba/msogba.htm">www.wvu.edu/~agexten/org&amp;agny/msogba/msogba.htm</a>	yes
Northeast Organic Farmers Assn.-Connecticut	<a href="http://www.connix.com/~nofact/">www.connix.com/~nofact/</a>	yes
Northeast Organic Farmers Assn.-MA	<a href="http://ma.nofa.org/nofama/">http://ma.nofa.org/nofama/</a>	yes
Northeast Organic Farmers Assn.-NJ	--	no
Northeast Organic Farmers Assn.-NY	--	no
Northeast Organic Farmers Assn.-Vermont	<a href="http://www.nofavt.org/">www.nofavt.org/</a>	no
Ohio Ecological Food & Farming Assn.	<a href="http://www.oeffa.org">www.oeffa.org</a>	yes
Oregon Tilth	<a href="http://www.tilth.org/">www.tilth.org/</a>	no
Organic Crop Improvement Assn.	<a href="http://www.ocia.org/">www.ocia.org/</a>	yes
Organic Growers & Buyers Assn.	<a href="http://www.ogba.org/">www.ogba.org/</a>	yes
Organic Growers Of Michigan	<a href="http://macatawa.org/org/ogm/ogm.html">http://macatawa.org/org/ogm/ogm.html</a>	yes
Organic Verification Organization of North America	<a href="http://www.organicfood.com/ovonus.html">www.organicfood.com/ovonus.html</a>	no
Pennsylvania Certified Organic	--	no
Quality Assurance International	<a href="http://www.qai-inc.com">www.qai-inc.com</a>	yes
Scientific Certification Systems (Nutriclean)	<a href="http://www.scs1.com">www.scs1.com</a>	no
Tennessee Land Stewardship Assn.	--	no
Vermont Maple Sugarmaker's Assn.	--	no

<sup>1</sup> List includes only certifiers active in 1997. A current list of certifiers is maintained by USDA's Appropriate Technology Transfer for Rural Areas Program (800-346-9140; [www.attra.org/attra-pub/orgcert.html](http://www.attra.org/attra-pub/orgcert.html)).

Source: Economic Research Service, USDA

**Table 2—State and private organic certifiers active in 1997 and services provided<sup>1</sup>**

Certifier	Headquarters	Certification services	
		Crops	Animals
<b>State</b>			
Colorado Dept. of Agriculture	Lakewood, CO	yes	no
Idaho Dept. of Agriculture	Boise, ID	yes	no
Kentucky Dept. of Agriculture	Frankfort, KY	yes	no
Louisiana Dept. of Agriculture and Forestry	Baton Rouge, LA	yes	no
Maryland Dept. of Agriculture	Annapolis, MD	yes	yes
New Hampshire Dept. of Agriculture	Concord, NH	yes	yes
New Mexico Organic Commodity Commission	Albuquerque, NM	yes	yes
Oklahoma Dept. of Agriculture	Oklahoma City, OK	yes	no
Rhode Island Dept. of Environmental Management	Providence, RI	yes	no
Texas Dept. of Agriculture	Austin, TX	yes	no
Virginia Dept. of Agriculture & Consumer Services	Blacksburg, VA	yes	no
Washington State Department of Agriculture	Olympia, WA	yes	yes
<b>Private</b>			
California Certified Organic Farmers (CCOF)	Santa Cruz, CA	yes	no
Carolina Farm Stewardship Assn.	Pittsboro, NC	yes	no
Demeter Assn.	Aurora, NY	yes	yes
Farm Verified Organic, Inc. (FVO)	Medina, ND	yes	yes
Florida Certified Organic Growers & Consumers	Gainesville, FL	yes	no
Georgia Organic Growers Assn.	Aceworth, GA	yes	no
Hawaii Bio-Organic Growers Assn.	Honolulu, HI	yes	no
Hawaii Kauai Organic Growers Assn.	Koloa, HI	yes	no
Hawaii Organic Farmers Assn.	Maui, HI	yes	no
Indiana Certified Organic	Greencastle, IN	yes	no
Maine Organic Farmers & Gardeners Assn.	Augusta, ME	yes	yes
Mountain State Organic Growers & Buyers Assn.	Kerens, WV	yes	no
Northeast Organic Farmers Assn.-CT	Northford, CT	yes	yes
Northeast Organic Farmers Assn.-MA	West Hatfield, MA	yes	no
Northeast Organic Farmers Assn.-NJ	Pennington, NJ	yes	yes
Northeast Organic Farmers Assn.-NY	Binghamton, NY	yes	yes
Northeast Organic Farmers Assn.-Vermont	Richmond, VT	yes	no
Ohio Ecological Food & Farming Assn.	Columbus, OH	yes	no
Oregon Tilth	Salem, OR	yes	no
Organic Crop Improvement Assn.	Lincoln, NE	yes	yes
Organic Growers & Buyers Assn.	Brooklyn Park, MN	yes	yes
Organic Growers of Michigan	Flushing, MI	yes	yes
Organic Verification Organization of North America	Hitterdal, MN	yes	no
Pennsylvania Certified Organic	Centre Hall, PA	yes	yes
Quality Assurance International (QAI )	San Diego, CA	yes	yes
Scientific Certification Systems (Nutriclean)	Oakland, CA	yes	no
Tennessee Land Stewardship Assn.	Bloomington Springs, TN	yes	yes
Vermont Maple Sugarmaker's Assn.	Westford, VT	yes	no

<sup>1</sup> Eleven other certifiers were contacted, but they were either not yet active, had become inactive, did not certify producers, or could not be reached by phone or mail.

Source: Economic Research Service, USDA.

and livestock, and farmers cannot obtain certified organic price premiums during this period.

## U.S. Adoption Patterns

Certified organic farming systems were being used on 1.35 million acres of cropland and pasture in 49 States in 1997 (table 3). Every State but Alaska and Mississippi had some certified cropland, and nearly two-thirds had certified pasture and rangeland. Certified organic animal production systems were being used in 23 States in 1997 (table 15).

Colorado and Alaska were the two top States in overall certified organic acreage in 1997, but most of their certified land was used for pasture and rangeland. Idaho, California, North Dakota, Montana, Minnesota, Wisconsin, Iowa, and Florida were the other top States in terms of certified organic acreage. Most of the certified land in these States was used for crop production.

Certified organic cropland more than doubled between 1992 and 1997, increasing from 403,400 acres to 850,173 acres, and was up 33 percent between 1995 and 1997 (table 4).<sup>2</sup> In contrast, certified organic pasture and rangeland declined through the early 1990s, but rebounded after 1995 (table 4). Unlike meat and poultry, egg and dairy producers did not face organic labeling restrictions during the 1990s, and the number of organic milk cows and layer hens expanded for most of the 1990s. The percentage increase in the number of certified organic growers between 1995 and 1997 was substantially less than the increase in farmland certified. Many existing organic farmers expanded their operations during that period, and a number of new large-scale operations became certified.

Overall, certified organic cropland and pasture accounted for 0.2 percent of U.S. cropland and pasture in 1997. About 2 percent of top specialty crops—lettuce, carrots, grapes, and apples—were grown under certified organic farming systems (table 5). Although

<sup>2</sup> USDA estimates of U.S. certified organic farmland and livestock in the United States between 1992 and 1994 are reported in Dunn (1995a and 1995b). Private-sector estimates for 1995 cropland and pasture acreage, along with small revisions for 1992-94 acreage estimates, are reported by Dunn in an Agrisystems International report. AgriSystems International is a market research and consulting firm headquartered in Wind Gap, Pennsylvania ([AgriSysI@aol.com](mailto:AgriSysI@aol.com), 610-863-6700).

**Table 3—Certified organic pasture and cropland, 1997, by State**

State	Certifiers	Cropland	Pasture and rangeland	U.S. total
	Number	-----Acres-----		
U.S. total	40	850,177	496,385	1,346,558
Alabama	1	1	-	1
Alaska	1	-	174,190	174,190
Arizona	3	9,681	-	9,681
Arkansas	3	997	-	997
California	6	96,851	5,968	102,819
Colorado	3	35,127	223,746	258,873
Connecticut	2	747	319	1,066
Delaware	1	165	-	165
Florida	4	32,745	-	32,745
Georgia	1	572	-	572
Hawaii	4	595	-	595
Idaho	3	107,955	3,475	111,430
Illinois	2	10,660	39	10,699
Indiana	3	1,994	-	1,994
Iowa	4	34,276	1,493	35,769
Kansas	3	24,314	-	24,314
Kentucky	1	5,416	250	5,666
Louisiana	1	371	-	371
Maine	3	5,272	1,489	6,761
Maryland	2	1,645	-	1,645
Massachusetts	3	841	293	1,134
Michigan	2	14,529	2,234	16,762
Minnesota	5	56,275	7,410	63,685
Mississippi	--	-	-	-
Missouri	3	6,339	1,961	8,300
Montana	4	59,362	20,750	80,112
Nebraska	3	28,104	1,104	29,208
Nevada	1	255	-	255
New Hampshire	1	265	-	265
New Jersey	1	1,218	116	1,334
New Mexico	4	6,058	20,397	26,455
New York	4	21,571	4,147	25,718
North Carolina	4	980	-	980
North Dakota	2	88,581	2,209	90,790
Ohio	3	11,766	249	12,015
Oklahoma	3	3,372	620	3,992
Oregon	1	14,399	2,585	16,984
Pennsylvania	5	6,288	223	6,511
Rhode Island	1	98	34	132
South Carolina	2	41	-	41
South Dakota	3	26,617	5,701	32,319
Tennessee	1	1,351	-	1,351
Texas	2	27,121	3,759	30,880
Utah	3	20,215	-	20,215
Vermont	2	17,321	3,826	21,146
Virginia	4	4,346	71	4,416
Washington	3	10,368	1,091	11,459
West Virginia	3	473	260	733
Wisconsin	3	41,245	6,377	47,622
Wyoming	1	75	-	75
Regional <sup>1</sup>	2	11,324	-	11,324

<sup>1</sup> Data not broken out by State.

Source: Economic Research Service, USDA.

**Table 4—U.S. certified organic farmland acreage and livestock numbers, 1992-97**

Item	1992	1993	1994	1995	1996	1997	Change	
							1992-97	1995-97
				<i>Acres</i>			<i>Percent</i>	
U.S. certified farmland:								
Total	935,450	955,650	991,453	917,894	--	1,346,558	44	47
Pasture/rangeland	532,050	490,850	434,703	279,394	--	496,385	(7)	78
Cropland	403,400	464,800	556,750	638,500	--	850,173	111	33
				<i>Number</i>			<i>Percent</i>	
U.S. certified animals:								
Beef cows	6,796	9,222	3,300	--	--	4,429	(35)	--
Milk cows	2,265	2,846	6,100	--	--	12,897	469	--
Hogs & pigs	1,365	1,499	2,100	--	--	482	(65)	--
Sheep and lambs	1,221	1,186	1,600	--	--	705	(42)	--
Layer hens	43,981	20,625	47,700	--	--	537,826	1,123	--
Broilers	17,382	26,331	110,500	--	--	38,285	120	--
Unclassified/other	--	--	--	--	--	226,105	--	--
				<i>Number</i>			<i>Percent</i>	
Total certified growers	3,587	3,536	4,060	4,856	--	5,021	40	3

Numbers may not add due to rounding.

Sources: 1992-94, Agricultural Marketing Service, USDA; 1995 (including revisions of 1992-94 farmland), Agrisystems International; 1997, Economic Research Service, USDA.

only 0.1 percent of the top U.S. field crops—corn and soybeans—were grown under certified organic farming systems, organic management was used for at least 1 percent of the oat, spelt (37 percent), millet, buckwheat (30 percent), rye, flax, and dry pea crops.

### Certified Organic Field Crops and Hay

U.S. farmers produced field crops and hay under certified organic systems on over half a million acres in 1997. Certified organic grain crops were grown on over 291,000 acres (table 6). Certified organic legume crops—mostly soybeans—were grown on over 96,000 acres (table 7) and oilseeds were produced on over 31,000 acres (table 8). Organic hay and silage crops were certified on nearly 127,000 acres in 1997 (table 9). Organic farmers grow a diversity of field crops because of the importance of crop rotation in controlling weeds and maintaining fertility in organic farming systems.

**Grain crops.** A variety of certified organic grains was grown in 35 States in 1997. North Dakota was the top producing State, with over 50,000 acres. Another dozen States—Montana, Minnesota, Idaho, Colorado, Nebraska, Iowa, Utah, Kansas, California, South Dakota, Wisconsin, and Texas—had at least 10,000 certified organic acres of grain crops (table 6).

Corn, wheat, and oats were grown organically in over two dozen States in 1997. Wheat was produced under certified organic farming systems on over 125,000 acres in 1997, corn was grown on over 42,000 acres, and oats and barley were each grown on almost 30,000 acres. Other certified organic grain crops—sorghum, rice (including wild rice), spelt, millet, buckwheat, and rye—were grown on under 15,000 acres each (table 6). State and private groups certified another 22,967 acres of organic grain crops in 1997 that could not be broken out into acreage for each specific crop.

Montana had the most certified organic wheat acreage, Minnesota had the most corn and buckwheat acreage, and North Dakota had the most oats, millet, and rye acreage in 1997 (table 6). Idaho was the leading organic barley producer and California had the most certified organic rice.

Certified organic wheat and corn acreage were both up 31 percent from 1995 estimates (table 5). U.S. farm-level organic corn prices averaged 35 percent higher than U.S. cash prices for conventional corn in 1995, and this premium widened in 1996 and 1997 (Dobbs, 1998). Organic prices for Hard Red Spring wheat were 50 percent or more higher than U.S. cash and futures prices for conventionally grown Spring wheat. General Mills, one of the mainstream food companies that have entered organic markets in recent years,

**Table 5—Certified organic and total U.S. acreage, selected crops, 1995-97**

Item	Total certified organic		Change 1995-97	U.S. cropland, 1997 <sup>2</sup>	Certified organic/total
	1997	1995 <sup>1/</sup>			
	-----Acres-----		Percent	Acres	Percent
<b>U.S. total</b>	1,346,558	914,800	47	828,029,449	0.16
<b>Total pasture and rangeland</b>	496,385	276,300	80	461,351,095	0.11
<b>Total cropland:</b>	850,173	638,500	33	366,678,354	0.23
<i>Grains—</i>					
Corn	42,703	32,650	31	69,796,716	0.1
Wheat	125,687	96,100	31	58,836,344	0.2
Oats	29,748	13,250	125	2,680,958	1.1
Barley	29,829	17,150	74	5,944,951	0.5
Rice	11,043	8,400	31	3,122,120	0.4
Spelt	1,704	12,350	(86)	4,648	36.7
Millet	12,285	18,550	(34)	358,885	3.4
Buckwheat	7,616	13,250	(43)	25,299	30.1
Rye	4,365	2,900	51	268,452	1.6
<i>Beans—</i>					
Soybeans	82,143	47,200	74	66,147,726	0.1
Dry beans	4,641	--	--	1,691,899	0.3
Dry peas & lentils	5,187	5,900	(12)	495,308	1.0
<i>Oilseeds—</i>					
Flax	8,053	5,850	38	139,776	5.8
Sunflowers	10,894	14,200	(23)	2,534,708	0.4
<i>Hay and silage—</i>					
All types	126,797	84,100	51	60,799,788	0.2
<i>Vegetables—</i>					
Tomatoes	3,780	--	--	414,624	0.9
Lettuce	5,743	--	--	308,501	1.9
Carrots	3,323	--	--	135,898	2.4
Mixed vegetables (< 5 acres)	2,699	--	--	7,228	37.3
Mixed vegetables (> 5 acres)	14,131	--	--	--	--
<i>Fruits—</i>					
Tree nuts	4,908	--	--	1,448,086	0.3
Citrus	6,099	--	--	1,345,352	0.5
Apples	8,846	--	--	570,320	1.6
Grapes	19,299	--	--	1,004,545	1.9
<i>Herbs, nursery, and greenhouse—</i>					
Herbs, culinary and medicinal	6,407	--	--	17,041	37.6
Herbs, wildcrafted	83,388	--	--	--	--
<i>Other cropland—</i>					
Cotton	9,974	32,850	(70)	13,235,236	0.1
Peanuts	2,969	--	--	1,352,155	0.2
Potatoes	4,335	--	--	1,355,241	0.3
Trees for maple syrup	13,858	10,200	36	120,863	11.5
Fallow	31,798	--	--	20,905,910	0.2

-- = Not available.

<sup>1</sup> Agrisystems International.

<sup>2</sup> U.S. Census of Agriculture.

Source: Economic Research Service, USDA

**Table 6—Certified organic grain crop acreage, by State, 1997**

State	Corn	Wheat	Oats	Barley	Sorghum	Rice <sup>1</sup>	Spelt	Millet	Buckwheat	Rye	Other	Total
	<i>Acres</i>											
U.S. total	42,703	125,687	29,748	29,829	3,075	11,043	1,704	12,285	7,616	4,365	22,957	291,013
Arkansas	-	-	-	-	-	245	-	-	-	-	-	245
California	110	727	210	600	-	8,877	-	268	-	-	1,191	11,983
Colorado	413	10,159	152	405	1,132	-	-	2,123	53	327	594	15,359
Delaware	39	12	11	-	-	-	-	-	-	-	-	62
Hawaii	3	-	-	-	-	-	-	-	-	-	-	3
Idaho	413	4,625	2,024	14,456	-	210	-	-	1	-	58	21,787
Illinois	1,966	764	693	38	-	-	69	-	108	244	50	3,932
Indiana	305	258	53	-	-	-	-	-	16	19	-	651
Iowa	4,895	1,817	2,520	470	22	-	-	-	-	75	3,748	13,547
Kansas	2,915	8,313	332	-	429	-	-	295	140	-	488	12,912
Kentucky	250	-	-	-	-	-	-	-	-	-	-	250
Maine	69	130	53	-	-	-	2	-	5	-	-	259
Maryland	79	-	-	24	-	-	-	-	-	-	-	103
Massachusetts	-	-	-	-	-	-	-	-	-	-	14	14
Michigan	931	801	256	387	12	-	680	-	150	119	732	4,068
Minnesota	10,002	4,432	1,772	689	208	78	80	804	3,656	294	414	22,426
Missouri	574	285	46	-	4	-	-	-	-	-	-	909
Montana	754	31,729	965	5,126	-	-	-	111	572	140	1,890	41,287
Nebraska	3,392	6,636	1,154	137	-	-	-	2,515	24	17	1,162	15,036
Nevada	-	150	75	-	-	-	-	-	-	-	-	225
New Jersey	-	-	-	-	-	-	-	-	-	-	164	164
New Mexico	299	1,786	13	-	-	-	-	-	-	-	90	2,188
New York	1,214	646	182	196	30	-	95	-	312	29	2,868	5,572
North Dakota	1,833	24,203	15,466	3,083	37	-	-	3,388	2,028	1,745	1,524	53,306
Ohio	2,079	1,825	410	-	-	-	515	-	172	28	-	5,029
Oklahoma	185	1,255	-	-	-	-	-	-	-	-	137	1,577
Oregon	-	90	-	-	-	-	-	-	-	30	55	175
Pennsylvania	546	345	135	141	-	-	236	-	40	80	234	1,757
South Dakota	1,809	4,502	1,219	822	100	-	-	2,407	208	866	159	12,090
Texas	635	4,650	104	1,318	1,069	1,633	-	341	21	-	1,079	10,850
Utah	-	13,435	40	-	-	-	-	-	-	-	-	13,475
Vermont	-	-	-	-	-	-	-	-	-	-	1,688	1,688
Virginia	333	84	-	-	-	-	-	-	-	-	750	1,167
Washington	79	1,583	78	208	-	-	-	-	-	3	-	1,951
Wisconsin	6,583	446	1,785	1,730	32	-	27	34	111	350	118	11,216
Regional <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	3,750	3,750

<sup>1</sup> Includes wild rice.

<sup>2</sup> Data not broken out by State.

Source: Economic Research Service, USDA

began test marketing organic versions of its Gold Medal flour in 1998 and launched a major nationwide advertising campaign for its new wheat and corn organic cereal in 1999.

Certified organic oat acreage more than doubled between 1995 and 1997 to 29,748 acres (table 5). Organic oat prices averaged 35 percent higher than U.S. cash prices for conventional oats in 1995 and the price spread continued to widen in 1996 and 1997 (Dobbs, 1998).

Organic grain buyers are widespread. For example, organic oats buyers—for oats and oat bran, oat flour, and rolled oats—are located in several dozen U.S. States and Canadian provinces, as well as in Japan, Australia, and New Zealand (Community Alliance with Family Farmers, 1999). The Organic Trade Association, a business association that represents the organic industry in North America, listed over 70 import/export businesses in its 1998 industry directory (OTA, 1998). About a half dozen of these businesses specialize in organic grain trade.

**Table 7—U.S. certified organic beans, by State, 1997**

State	Soybeans	Dry beans	Dry peas/lentils	Unclassified/Other	Total beans
			<i>Acres</i>		
U.S. total	82,143	4,641	5,187	4,212	96,183
Arizona	-	6	-	-	6
Arkansas	600	-	-	-	600
California	-	1,109	-	-	1,109
Colorado	-	555	-	-	555
Delaware	67	-	-	-	67
Idaho	-	435	14	-	449
Illinois	3,686	-	-	39	3,725
Indiana	888	-	-	-	888
Iowa	13,247	46	160	125	13,578
Kansas	4,538	238	1	523	5,300
Kentucky	591	-	-	-	591
Louisiana	50	-	-	-	50
Maine	1	37	-	-	38
Michigan	6,103	826	-	405	7,335
Minnesota	12,416	82	11	1,551	14,060
Missouri	2,726	-	-	-	2,726
Montana	2,876	1	1,889	90	4,856
Nebraska	7,580	65	246	118	8,009
New Hampshire	70	-	-	-	70
New Jersey	155	-	-	-	155
New Mexico	43	-	-	-	43
New York	2,082	173	-	-	2,255
North Carolina	81	-	-	-	81
North Dakota	3,711	437	1,562	1,082	6,792
Ohio	5,144	-	-	10	5,154
Oklahoma	383	150	150	145	828
Pennsylvania	464	-	-	99	563
South Dakota	5,435	-	-	-	5,435
Tennessee	1,349	-	-	-	1,349
Texas	569	190	434	25	1,218
Utah	-	50	38	-	88
Virginia	1,327	-	-	-	1,327
Washington	-	1	75	-	76
Wisconsin	5,963	240	607	-	6,810

Source: Economic Research Service, USDA.

Certified organic grain acreage was well under 1 percent of the U.S. total for corn, wheat, barley, and rice (table 5). However, between 1 and 3.5 percent of the U.S. oats, millet, and rye crops were certified organic in 1997. About one-third of two specialty grain crops—spelt (used in cereals and other food products) and buckwheat—were grown under certified organic farming systems in 1997.

**Soybeans and other legume crops.** Soybeans are the top legume crop grown under certified organic farming

**Table 8—U.S. certified organic oilseeds acreage, by State, 1997**

State	Flax	Sunflowers	Unclass./Other	Total oilseeds
	<i>Acres</i>			
U.S. total	8,053	10,894	12,487	31,433
Arizona	-	504	360	864
California	-	-	4,411	4,411
Colorado	-	96	236	332
Idaho	-	4	670	674
Iowa	-	729	-	729
Kansas	-	1,481	-	1,481
Michigan	-	105	-	105
Minnesota	577	875	-	1,453
Montana	137	435	633	1,205
Nebraska	73	516	10	599
North Carolina	-	30	-	30
North Dakota	7,149	4,536	484	12,170
Ohio	-	48	-	48
Oklahoma	-	-	528	528
South Dakota	112	1,534	289	1,935
Texas	-	-	7	7
Utah	-	-	4,857	4,857
Wisconsin	4	-	2	6

Source: Economic Research Service, USDA.

systems. U.S. growers produced over 82,000 acres of certified organic soybeans in 1997 (table 7), up 74 percent from the private-sector estimate of 47,200 acres in 1995 (table 5). This expansion was due in part to annual organic soybean prices that averaged nearly double or more the U.S. cash and nearby futures prices of conventional soybeans between 1995 and 1997 (Dobbs, 1998).

Certified organic dry peas and lentils were grown on nearly 5,200 acres in the United States in 1997. Montana and North Dakota led with over 1,500 acres each. Organic dry peas and lentils accounted for about 1 percent of the total dry pea and lentil acreage in the United States in 1997, while organic soybeans accounted for only 0.1 percent of the total (table 5).

Certified organic dry beans were grown on over 4,600 acres in 1997, and California had almost a quarter of those acres (table 7). Certifiers reported another 4,212 acres of organic legume crops in 1997 that could not be broken out into acreage for each specific crop.

**Oilseeds.** Certified organic oilseeds—including flax and sunflowers—were grown on 31,400 acres in 18 States in 1997 (table 8). Certified organic sunflowers

were grown on almost 11,000 acres, and flax was grown on over 8,000 acres. North Dakota was by far the biggest producer, with over 7,000 acres of flax and 4,500 acres of sunflowers. Another 12,500 acres of certified organic oilseeds were unclassified. California and Utah each had over 4,400 acres of certified organic oilseeds that could not be classified by crop.

Certified organic flax represented almost 6 percent of total U.S. flax acreage in 1997, while organic sunflowers represented 0.4 percent of the total sunflower acreage (table 5).

**Hay and silage.** Hay and silage crops were grown under certified organic farming systems on 126,800 acres in 1997 (table 9). Certifiers reported certifying 62,460 acres of alfalfa hay, 11,580 acres of haylage silage, and 42,760 acres of unclassified hay and silage. Idaho was the top organic hay and silage producer, with over 30,000 acres of alfalfa hay. Wisconsin had over 13,000 acres of certified hay and silage crops, and New York and North Dakota had almost 10,000 acres each. Not all of these States had certified organic livestock production in 1997, but several did. New York had the largest number of certified organic cows, pigs, and sheep in 1997—mostly milk cows—and Wisconsin had the second largest number—also mostly milk cows (table 15).

Certified organic hay and silage crops were well under 1 percent of total U.S. acreage in 1997 (table 5).

However, acreage of these crops expanded 51 percent between 1995 and 1997 as the number of certified organic milk cows more than doubled during that period.

### Certified Organic Specialty and Minor Crops

U.S. farmers produced certified organic specialty and minor crops on over 300,000 acres in 1997.

Vegetables were produced organically on over 48,000 acres (table 10) and fruits on over 49,000 acres (table 12). Certified organic herb and nursery crops were grown on over 7,000 acres and were harvested from 83,000 acres of other certified land (table 13). Cotton, peanuts, and other minor and unclassified crops were grown on 116,300 acres (table 14).

**Vegetables.** The market for organic vegetables has been developing for over three decades in the United

**Table 9—U.S. certified organic hay and silage acreage, by State, 1997**

State	Alfalfa hay	Haylage silage	Unclass./ Other	Total
Acres				
U.S. total	62,460	11,579	52,758	126,797
Arizona	1,143	-	-	1,143
Arkansas	-	-	17	17
California	1,136	354	258	1,748
Colorado	3,039	57	242	3,337
Connecticut	-	-	475	475
Delaware	15	-	16	31
Idaho	30,264	909	31	31,204
Illinois	516	-	430	946
Indiana	109	-	41	150
Iowa	665	-	3,483	4,148
Kansas	1,293	-	326	1,619
Kentucky	-	-	250	250
Maine	-	-	3,930	3,930
Maryland	139	133	-	272
Massachusetts	-	-	380	380
Michigan	445	77	928	1,450
Minnesota	2,513	980	3,400	6,893
Missouri	557	-	597	1,154
Montana	4,768	-	4,027	8,795
Nebraska	2,520	59	254	2,833
Nevada	30	-	-	30
New Hampshire	-	-	30	30
New Jersey	-	-	333	333
New Mexico	900	684	25	1,609
New York	6	-	9,989	9,995
North Carolina	160	-	-	160
North Dakota	7,696	1,289	635	9,621
Ohio	92	-	783	875
Oklahoma	53	-	157	210
Oregon	39	152	505	696
Pennsylvania	975	200	1,305	2,480
Rhode Island	-	-	32	32
South Dakota	1,640	2,933	1,103	5,676
Texas	210	2,865	-	3,075
Utah	816	-	-	816
Vermont	-	394	5,414	5,808
Washington	184	493	49	726
West Virginia	-	-	71	71
Wisconsin	538	-	13,243	13,781

Source: Economic Research Service, USDA.

States, and vegetables are still grown organically in more States than any other type of commodity. State and private certifying groups certified 48,227 acres of organic vegetable crops in 43 States in 1997 (table 10). About a third of this acreage was for “mixed vegetables”; over 25 percent was for lettuce, tomatoes, or carrots; and over a third was other vegetables and veg-

**Table 10—Certified organic vegetable acreage, by State, 1997**

State	Tomatoes	Lettuce	Carrots	Mixed vegetables		Unclassified/ Other vegetables	Total vegetables
				< 5 acres	> 5 acres		
				<i>Acres</i>			
U.S. total	3,780	5,743	3,323	2,699	14,131	18,550	48,227
Alabama	-	-	-	1	-	-	1
Arizona	1	1,245	215	-	120	1,500	3,081
Arkansas	-	-	-	-	66	5	71
California	1,935	4,439	2,587	203	7,310	6,412	22,886
Colorado	11	12	298	57	2,258	1,079	3,716
Connecticut	-	-	-	-	-	271	271
Florida	-	2	-	45	373	598	1,017
Hawaii	-	4	-	6	-	52	61
Idaho	23	-	6	6	23	78	136
Illinois	232	-	-	-	-	928	1,160
Indiana	-	-	-	-	-	75	75
Iowa	-	-	-	-	-	118	118
Kansas	-	-	-	-	-	27	27
Kentucky	-	-	-	63	72	40	175
Louisiana	-	-	-	53	76	-	129
Maine	-	-	3	185	174	-	362
Massachusetts	-	-	-	63	213	100	375
Michigan	-	-	-	58	692	53	803
Minnesota	1	-	-	24	144	1,515	1,684
Missouri	-	-	-	-	-	283	283
Montana	-	1	-	-	-	4	5
Nebraska	2	-	-	-	-	246	248
New Hampshire	5	10	1	-	80	-	96
New Jersey	-	-	-	46	205	-	251
New Mexico	-	-	-	40	110	7	157
New York	-	-	-	1,437	94	84	1,615
North Carolina	-	-	-	253	143	-	396
North Dakota	-	-	-	-	-	191	191
Ohio	86	-	-	-	-	136	222
Oklahoma	-	-	-	-	-	35	35
Oregon	7	-	-	64	1,348	927	2,345
Pennsylvania	-	-	-	39	309	31	379
Rhode Island	-	-	-	-	-	39	39
South Carolina	-	-	-	3	-	25	28
South Dakota	-	-	-	-	-	48	48
Tennessee	-	-	-	2	-	-	2
Texas	16	10	58	-	-	180	264
Utah	-	-	-	-	-	445	445
Vermont	-	-	-	-	-	677	677
Virginia	-	-	-	26	107	196	330
Washington	1,458	19	155	25	216	1,267	3,140
West Virginia	-	-	-	2	-	9	11
Wisconsin	4	1	-	-	-	569	574
Regional <sup>1</sup>	-	-	-	-	-	300	300

<sup>1</sup> Data not broken out by State.

Source: Economic Research Service, USDA.

etable crops that could not be classified. Almost 2 percent of U.S. lettuce acreage, 2.4 percent of carrot acreage, and 1 percent of tomato acreage was certified organic (table 5). And over a third of the U.S. “mixed vegetable” acreage was under organic management.

California is the biggest vegetable producer in the United States, and also has the most certified organic vegetable acreage in 1997. Six private certifying organizations certified 22,886 acres of organic vegetables in California in 1997. Colorado and Washington followed with 3,716 and 3,140 acres certified in 1997. Arizona, Oregon, Minnesota, New York, Illinois, and Florida each had over 1,000 acres of certified organic vegetables in 1997. Texas was a top organic vegetable State in several earlier public and private reports, but the Texas Department of Agriculture reported a large drop in certified organic acreage in 1997 (Greene and Calvin, 1997; Agrisystems, 1997).

“Mixed vegetables” is a term used in the census of agriculture to classify small farms with a large number of vegetables. The census allows farms up to 50 acres with 5 or more vegetable crops to be classified as mixed-vegetable acreage, although in practice it rarely uses that category for farms over 5 acres. In this study, mixed vegetable farms were broken into parcels with 5 acres or less and those with 5 acres or more (but generally under 20 acres).

In 1997, farmers grew 2,700 acres of certified organic mixed vegetables on farms or parcels of 5 acres or less, and 14,100 acres on farms/parcels over 5 acres (table 10). Most States had some certified organic mixed vegetable crops in 1997. Much of this acreage, especially on the smaller farms, is grown for farmers’ markets, consumer subscriptions, restaurants, and other direct marketing outlets. USDA producer survey data indicate that certified organic vegetable growers are smaller than conventional vegetable growers, and they use direct marketing outlets much more than conventional growers (Fernandez-Cornejo et al., 1998). Similarly, an extension survey of acreage, yield, and costs for organic fresh-market vegetable production in Minnesota showed that most of these growers were very small: over 30 vegetable crops were produced in 1995, and producers grew two-thirds of these crops on an acre or less (Locke et al., 1997).

California was the top producer of certified organic tomatoes, lettuce, and carrots in 1997 (table 10). Carrots and lettuce are grown primarily for the fresh market, and California had 4,439 acres of certified organic lettuce in 1997 and 2,587 acres of carrots. Arizona had 1,245 acres of certified organic lettuce; Colorado had 298 acres of carrots. Carrots are one of the few organic commodities that USDA has tracked premiums for in a U.S. wholesale market. During 1996 and 1997, the demand for carrots was strong in the Boston wholesale market, with monthly organic premiums averaging 110 percent higher than for conventionally grown carrots (Greene and Calvin, 1997).

California is also the largest processed tomato producer in the world, and some of the large processing tomato growers in that State are now growing part of their crop in organic rotations (Klonsky et al., 1993-94a). Producers in California grew 1,935 acres of certified organic tomatoes in 1997, mostly for the processing market. Washington growers had over 1,400 acres of certified organic tomatoes. National data are

**Table 11—Certified organic and total vegetable acreage, top States, 1997**

State	Certified organic vegetables <sup>1</sup>	Total vegetables <sup>2</sup>	Certified organic total
	-----Acres-----		Percent
U.S. total	48,227	3,589,670	1.3
Vermont	677	2,866	23.6
Colorado	3,716	42,854	8.7
Utah	445	6,637	6.7
Maine	362	11,701	3.1
Connecticut	271	9,738	2.8
Arizona	3,081	110,737	2.8
Massachusetts	375	15,855	2.4
California	22,886	1,065,465	2.1
Illinois	1,160	64,655	1.8
Washington	3,140	204,746	1.5
Oregon	2,345	154,362	1.5
Missouri	283	20,781	1.4
Virginia	330	25,087	1.3
New York	1,615	167,834	1.0
Pennsylvania	379	44,270	0.9
North Carolina	396	48,606	0.8
Minnesota	1,684	218,800	0.8
Michigan	803	125,780	0.6
Florida	1,017	226,366	0.4
Wisconsin	574	267,629	0.2

<sup>1</sup> Excluding potatoes. <sup>2</sup> Census of Agriculture, 1997  
Source: Economic Research Service, USDA.

not available on organic tomato acreage for previous years, but price data show that processed organic tomato premiums were consistently over 100 percent at the farm level during 1990-96 (Vandeman, 1998).

Certified organic vegetable acreage accounted for 1.3 percent of U.S. vegetable acreage in 1997 (table 11). Over 2 percent of the vegetable acreage in Arizona, California, Colorado, Massachusetts, Maine, Utah, Connecticut, and Vermont were certified organic in 1997.

Vermont had the highest percentage of certified vegetable acreage, at almost 24 percent, in 1997. Organic farming in Vermont has been expanding steadily for well over a decade, and the number of certified organic farms in Vermont has risen steadily from 14 in 1986 to 179 in 1998 (Schmidt and Bower, 1999). Vermont tends to have smaller and more diversified farms than other States, mostly operating on hilly terrain, and an organic farming association has been active in that State for almost three decades.

**Fruits and tree nuts.** State and private groups certified over 49,000 acres of organic fruit and nut crops in 36 States in 1997 (table 12). Organic grapes accounted for 39 percent of the acreage certified, followed by apples (18 percent), citrus (12 percent), and tree nuts (10 percent); 21 percent of the total was unclassified.

Growers in California had 32,582 acres of certified organic fruit and nut acreage, over two-thirds of the total. Arizona was second (4,361 acres), and Washington third (2,978 acres). California is the leading State in many fruit and nut crops, and has had third-party-certified organic production longest. The oldest U.S. certifier, California Certified Organic Farmers, is located in Santa Cruz.

Organic markets for table grapes, raisins, juice, and other grape products have been developing for over a decade, and the acreage devoted to organic wine grape production has expanded during the 1990s (California Certified Organic Farmers, 1996). California growers produced over 18,400 acres of certified organic grapes in 1997, 96 percent of the U.S. total. Nine other States produced organic grapes, but none of them had over 500 acres of vineyards. Nearly 2 percent of total U.S. acreage for grape vineyards was managed under certified organic farming systems in 1997 (table 5).

Certified organic apples were produced in 16 States in 1997; Arizona, California, Washington, and Colorado had over 1,000 acres under organic management (table 12). Arizona was the top producer with 3,178 acres, and California was second with 1,883 acres. Growers produced certified organic apples on 1.6 percent of the total U.S. acreage for apple orchards in 1997 (table 5). Major varieties being grown organically include Fuji, Jonagold, McIntosh, and Red Delicious (Klonsky et al., 1993-94b, 1993-94c). Producer demand for information on organic apple production has risen along with consumer demand, and government agencies are beginning to develop workshops and guidelines (Vossen and Gubler, 1995; Ellis, 1997; Sauls et al., 1997; and Rutgers Cooperative Extension, 1998).

Almost all of the citrus-producing States produced organic citrus crops in 1997, and California was the top producer with 3,012 acres, about 1 percent of California's total citrus crop. Florida was second with 2,296 acres (table 12). The Texas Agricultural Extension Service indicates that organic production potential is high in that State (Sauls et al., 1997). Most of the sucking insect and mite pests are under partial biological control, and cultural techniques and plant material quarantines effectively address many major citrus diseases.

Nine States produced organic tree nuts in 1997, and California (3,542 acres) and Texas (913 acres) were the biggest producers. California grows mostly almonds, walnuts, and pistachios, while pecans are the top tree nut crop in Texas. Irrigation practices vary even within organic farming systems in the same region. For example, flood irrigation and sprinkler irrigation are both used to produce organic almonds in California's Northern San Joaquin Valley (Asai et al., 1992).

**Herbs, nursery, and greenhouse.** Certified organic herbs were cultivated on 6,407 acres in 1997, and were wildcrafted on 83,388 acres (table 13).<sup>3</sup> Flowers, mushrooms, and other nursery and greenhouse crops—such as vegetable plants and ornamentals—were grown organically on about 1,000 acres and in 378,928 square feet of greenhouse space.

<sup>3</sup> Wild crops are plants or portions of plants that are harvested from land that is not maintained under cultivation or other agricultural management.

**Table 12—Certified organic fruit acreage, by State, 1997**

State	Tree nuts	Citrus	Apples	Grapes	Unclassified/ Other	Total fruits
	<i>Acres</i>					
U.S. total	4,908	6,099	8,846	19,299	10,261	49,414
Arizona	71	595	3,178	47	470	4,361
Arkansas	-	-	12	-	9	21
California	3,542	3,012	1,883	18,467	5,677	32,582
Colorado	1	-	1,270	1	544	1,816
Connecticut	-	-	-	-	-	-
Delaware	-	-	-	-	-	-
Florida	-	2,296	-	8	321	2,625
Hawaii	190	-	-	-	124	314
Idaho	-	-	-	5	22	27
Indiana	-	-	-	-	7	7
Kentucky	-	-	-	-	30	30
Louisiana	-	5	-	-	32	37
Maine	-	-	24	-	124	148
Massachusetts	1	-	-	-	54	55
Michigan	-	-	228	-	109	337
Minnesota	-	-	202	-	158	360
Missouri	-	-	-	-	10	10
New Hampshire	-	-	8	-	31	9
New Jersey	-	-	-	-	7	7
New Mexico	87	-	59	90	-	236
New York	-	-	30	129	167	326
North Carolina	-	-	-	-	6	6
Ohio	-	-	-	-	3	3
Oklahoma	-	-	-	-	2	2
Oregon	80	-	9	112	1,030	1,231
Pennsylvania	-	-	139	-	121	260
Rhode Island	-	-	-	-	3	3
South Carolina	-	-	-	-	1	1
South Dakota	-	-	2	-	-	2
Texas	913	191	-	6	234	1,344
Utah	-	-	-	-	12	12
Vermont	-	-	-	-	56	56
Virginia	-	-	-	-	60	60
Washington	24	-	1,707	434	813	2,978
West Virginia	-	-	5	-	10	15
Wisconsin	-	-	90	-	15	105

Source: Economic Research Service, USDA

Producers grew certified organic herbs for culinary and medicinal uses in 32 States. California was the largest producer of cultivated organic herbs, with 1,062 acres, followed by Washington (846 acres) and Illinois (797 acres). Seven other States (Oregon, North Carolina, Florida, Missouri, Minnesota, Colorado, and Wisconsin) had over 200 acres of cultivated herbs. Hundreds of different types and varieties are being cultivated in these States.

State and private certifying agencies certified over 80,000 acres of forests, scrublands, and other natural areas in 3 States for harvesting organic herbs and other wild crops in 1997 (table 13). Idaho had 52,000 acres of wildcrafted St. John's wort, a popular medicinal herb, in 1997. Florida had 25,000 acres of certified organic saw palmetto berries (which have medicinal uses) and maypop (which have culinary and medicinal uses), indigo (which is used as a natural hair dye), polk (a wild salad green), and other crops. Oregon

**Table 13—Herbs, nursery and greenhouse, by State, 1997**

State	Cultivated herbs	Wildcrafted herbs <sup>1</sup>	Cut flowers	Mushrooms	Other	Total herbs and nursery	Total greenhouse <sup>2</sup>
	-----Acres-----					Square feet	
U.S. total	6,407	83,388	288	61	631	90,776	378,928
Arizona	40	-	-	-	-	40	20,000
Arkansas	-	-	-	32	-	32	-
California	1,062	-	145	-	475	1,682	11,730
Colorado	226	-	17	1	3	246	-
Connecticut	1	-	-	-	-	1	-
Florida	268	25,000	-	11	31	25,310	1,632
Hawaii	15	-	2	-	1	18	-
Idaho	35	52,388	1	-	-	52,424	-
Illinois	797	-	-	-	-	797	-
Iowa	48	-	-	-	-	48	-
Kansas	34	-	-	-	-	34	-
Kentucky	65	-	-	-	-	65	-
Louisiana	1	-	-	-	-	1	-
Maine	-	-	-	-	-	-	4,510
Massachusetts	12	-	5	-	-	17	-
Michigan	1	-	-	-	-	1	1,250
Minnesota	250	-	107	-	30	386	-
Missouri	263	-	-	2	-	265	-
Montana	-	-	-	-	-	1,189	-
Nebraska	25	-	-	-	-	25	-
New Hampshire	1	-	-	-	-	1	3,000
New Jersey	8	-	-	-	-	8	-
New Mexico	27	-	4	-	3	34	-
North Carolina	287	-	2	-	-	289	-
North Dakota	75	-	-	-	-	75	-
Oklahoma	1	-	1	-	-	2	-
Oregon	441	6,000	-	11	5	6,457	-
Pennsylvania	10	-	-	-	4	14	29,000
Rhode Island	-	-	2	-	8	10	-
South Dakota	9	-	-	-	-	9	-
Texas	22	-	-	-	20	42	28,976
Vermont	-	-	-	-	32	32	278,710
Virginia	34	-	-	-	-	34	-
Washington	846	-	-	4	-	850	-
West Virginia	21	-	1	-	20	42	120
Wisconsin	220	-	2	-	-	222	-
Wyoming	75	-	-	-	-	75	-
Regional <sup>3</sup>	1,189	-	-	-	-	1,189	-

<sup>1</sup> Includes St. John's wort in Idaho; saw palmetto berries, maypop, indigo and polk in Florida; and lake algae and St. John's wort in Oregon.

<sup>2</sup> Includes mushrooms, flowers, and other greenhouse products.

<sup>3</sup> Data not broken out by State.

Source: Economic Research Service, USDA.

**Table 14—Certified organic acreage of other crops, by State, 1997**

State	Cotton	Peanuts	Potatoes	Green manure cover crops <sup>1</sup>	Trees for maple syrup	Fallow	Unclassified/ Other	Total
	<i>Acres</i>							
U.S. total	9,974	2,969	4,335	7,089	13,858	31,798	46,310	116,333
Arizona	-	-	-	-	-	-	186	186
Arkansas	-	-	1	-	-	-	10	11
California	756	-	1,091	-	-	17,987	616	20,450
Colorado	-	-	905	5,173	-	3,015	674	9,767
Delaware	-	-	-	-	-	-	5	5
Florida	-	-	-	-	-	-	3,792	3,792
Georgia	-	-	-	-	-	-	572	572
Hawaii	-	-	5	58	-	-	136	199
Idaho	-	-	618	67	-	512	57	1,254
Illinois	-	-	39	-	-	-	61	100
Indiana	-	-	-	-	-	-	223	223
Iowa	-	-	1	-	-	-	2,108	2,109
Kansas	-	-	-	-	-	2,394	547	2,941
Kentucky	-	-	-	-	-	-	4,055	4,055
Louisiana	-	-	-	-	-	-	154	154
Maine	-	-	10	-	525	-	-	535
Maryland	-	-	-	-	-	-	1,270	1,270
Michigan	-	-	1	-	-	249	180	430
Minnesota	-	-	127	-	5,545	678	2,664	9,014
Missouri	572	-	-	-	-	138	282	992
Montana	-	-	-	562	-	1,257	207	2,026
Nebraska	-	-	-	-	-	1,302	52	1,354
New Hampshire	-	-	10	15	-	5	-	30
New Jersey	-	-	-	-	-	300	-	300
New Mexico	512	1,189	-	-	-	90	-	1,791
New York	-	-	-	-	1,206	162	440	1,808
North Carolina	-	-	-	-	-	-	18	18
North Dakota	-	-	88	833	-	2,429	3,077	6,427
Ohio	-	-	4	-	-	174	257	435
Oklahoma	-	-	-	-	-	190	-	190
Oregon	-	-	68	-	-	-	3,426	3,494
Pennsylvania	-	-	1	-	20	30	785	836
Rhode Island	-	-	-	-	-	5	9	14
South Carolina	-	-	-	-	-	-	13	13
South Dakota	-	-	-	381	-	852	189	1,422
Texas	8,134	1,780	407	-	-	-	-	10,321
Utah	-	-	142	-	-	-	380	522
Vermont	-	-	-	-	6,562	-	2,497	9,059
Virginia	-	-	-	-	-	-	1,429	1,429
Washington	-	-	645	-	-	-	1	646
West Virginia	-	-	-	-	-	-	335	335
Wisconsin	-	-	173	-	-	29	8,329	8,531
Regional <sup>2</sup>	-	-	-	-	-	-	7,274	7,274

<sup>1</sup> Doesn't include green manure and cover crops that are intercropped and double-cropped.

<sup>2</sup> Data not broken out by State

Source: Economic Research Service, USDA.

certified 6,000 acres of lake algae (which has medicinal uses) and St. John's wort.

Certified organic cut flowers were produced in a dozen States on 288 acres in 1997. California was the largest producer with 145 acres. Certified organic mushrooms were produced on 61 acres in 6 States in 1997.

**Other certified crops and land.** Growers produced about 70,000 acres of other certified organic crops in 1997, including cotton, peanuts, potatoes, and trees for maple syrup (table 14). Over 46,000 acres of organic crops certified by State and private certifiers were not classified by crop or by farm sector.

Certified organic cotton was produced in 4 States—Texas, New Mexico, Missouri, and California—on 9,974 acres in 1997. Texas had over three-fourths of the U.S. organic cotton acreage in 1997, much of it operated by an organic cotton marketing cooperative that formed in the early 1990s and is still active. Certified organic cotton acreage in 1997 was 70 percent lower than 1995 acreage, and accounted for only 0.1 percent of U.S. cotton acreage (table 5). Several major clothing companies tested organic cotton clothing lines without commercial success in the mid-1990s. These companies have now switched to a new approach—blending organic with conventional cotton—to help stabilize the market and encourage organic production (Bunin, 2000). Also, startup U.S. companies have begun to sell all-organic cotton clothing and textiles. However, U.S. producers are facing increasing competition for the organic cotton market from countries with lower labor, input, and technology costs (Bunin).

Potatoes were grown under certified organic production systems on 4,335 acres in 19 States in 1997 (table 14). California led with 1,091 acres, followed by Colorado (905 acres), Washington (645 acres), and Idaho (618 acres). Only 0.3 percent of the U.S. potato crop in 1997 was managed under certified organic farming systems (table 5). Production costs for organic potato production on a large scale may still be higher, and yields lower, than for conventional potato production. A University of Wisconsin study in the early 1990s found slightly higher production costs and significantly lower yields in a 1-year trial in that State (Wyman and Diercks, 1998).

A small crop of organic peanuts—2,969 acres in Texas and New Mexico—was certified in 1997. Over 13,800 acres of trees used for maple syrup production were certified in 1997, up 36 percent from 1995, led by Vermont and Minnesota.

Certified organic producers left 31,800 acres fallow in 1997. Over 7,000 acres of cover crops were certified in 1997, but most of the cover crop acreage was not included in this study because only one crop was counted on each acre per year.

## Certified Organic Livestock

The development of certification standards for U.S. livestock has lagged standards for crops. Only 16 of the 40 certifying groups active in 1997—4 State and 12 private—serviced livestock production (table 2). Organic meat and poultry markets have lagged those for crops partly because meat and poultry could not be labeled as organic until February 1999, when a provisional label was approved by USDA (U.S. Department of Agriculture, 1999). Food crops and nonmeat animal foods (eggs and dairy products) are regulated by the Food and Drug Administration, and have been allowed to carry an organic label throughout the 1990s.

Certified organic livestock is still well under 1 percent of total U.S. livestock. However, the number of dairy cows and layer hens produced under certified organic farming systems increased sharply during the 1990s, and the market for organic meat products is expected to grow now that organic labeling is permitted.

**Cows, pigs, and sheep.** Farmers and ranchers raised certified organic cows, pigs, and sheep in 23 States in 1997 (table 15). Dairy cows led, with 12,897 animals certified organic in 1997. New York was the top producer (3,386 dairy cows), followed by Wisconsin (2,509) and Minnesota (2,425). Pennsylvania, California, and Maine also had over 1,000 organic dairy cows each.

The number of certified organic milk cows nearly tripled between 1992 and 1994 and more than doubled between 1994 and 1997. Organic dairy sales in mainstream supermarkets were up 200 percent or more in several major markets—including Baltimore, Phoenix, Detroit, and Boston—between December 1997 and December 1998. Organic dairy sales jumped over 500

**Table 15—U.S. certified organic livestock, 1997, by State**

State	Cows, pigs, and sheep					Chickens and other poultry					Other animals <sup>1</sup>
	Beef cows	Milk cows	Hogs & pigs	Sheep & lambs	Total	Layer hens	Broilers	Turkeys	Other/ Unclassified	Total	
	<i>Number</i>										
U.S. total	4,429	12,897	482	705	18,513	537,826	38,285	750	221,389	798,250	3,966
California	400	1,089			1,489	350,000	-	-	-	350,000	-
Connecticut	78	8	12	81	185	57	-	-	-	57	-
Hawaii	-	-	-	-	-	-	-	-	-	-	3,700
Illinois	-	90	-	-	90	-	-	-	-	-	-
Indiana	-	-	-	-	-	15,000	-	-	-	15,000	-
Kansas	-	-	-	-	-	15,000	-	-	-	15,000	-
Maine	42	1,020	20	169	1,251	348	900	-	-	1,248	27
Maryland		504	-	-	504		-	-	-	-	-
Michigan	1,800	160	-	9	1,969	40	-	-	-	40	-
Minnesota	39	2,425	-	-	2,464	8,006	1,000	-	85	9,091	91
Missouri	842	100	-	-	942	-	-	-	-	-	-
Montana	-	-	-	-	-	-	-	-	-	-	40
New Hampshire	-	-	-	-	-	-	-	-	40,000	40,000	-
New Jersey	25	2	-	15	42	25	-	-	-	25	-
New Mexico	300	-	-	-	300	-	2,500	750	-	3,250	75
New York	189	3,386	-	51	3,626	-	-	-	161,304	161,304	-
North Carolina	-	-	-	-	-	9,700	-	-	20,000	29,700	-
Ohio	-	-	-	-	-	30,000	-	-	-	30,000	3
Pennsylvania	100	1,256	-	200	1,556	37,300	29,000	-	-	66,300	30
South Dakota	430	-	-	180	610	-	-	-	-	-	-
Virginia	-	-	-	-	-	62,400	-	-	-	62,400	-
Washington	100	342	450	-	892	9,360	1,385	-	-	10,745	-
Wisconsin	84	2,509	-	-	2,593	590	3,500	-	-	4,090	-

<sup>1</sup> Includes goats and other animal specialties.

Source: Economic Research Service, USDA.

percent during that period in the Houston market (Barnard, 1999).

Thirteen States contained 4,429 certified organic beef cows in 1997, and almost 40 percent were in Michigan. Fewer than 1,000 sheep and lambs were certified organic in 1997, and only 482 hogs and pigs were certified organic. The number of certified organic animals in all of these categories declined between 1992 and 1997 (table 4), partly due to the lack of labeling.

The United States had 537,826 certified organic layer hens in 1997, up sharply from 47,700 layers in 1994. (table 4), along with 38,285 organic broiler hens, 750 turkeys, and 221,389 unclassified organic poultry animals. California was the leader in organic poultry production, with 350,000 organic birds, followed by New York (161,304) and Pennsylvania (66,300 birds). Other organic animal specialties—including goats, fish and bee colonies—were certified in several States. Hawaii had 3,700 certified organic bee colonies.

## Conclusions

U.S. certified organic cropland in the United States more than doubled between 1992 and 1997, but is still modest because of the low starting base. Only 0.2 percent of total cropland was managed under certified organic farming systems in 1997, although about 2 percent of some of the major specialty crops (apples, grapes, lettuce, and carrots) was under organic management.

Strong market signals for organically produced agricultural goods, along with growing public and private support for organic farming systems, make it likely that organic production will remain a fast-growing segment of U.S. agriculture. Government's efforts to facilitate organic production have focused primarily on developing national certification standards, but USDA has recently begun several small organic programs, including export promotion, farming systems trials, and weed management research. USDA has also started a pilot program in 15 States to provide financial

## Methods and Data

USDA analyzed data from State and private certification groups in the early 1990s to calculate certified organic farmland acreage and livestock numbers (Dunn 1995a, 1995b). Noncertified production was excluded, even though it may be a large segment of U.S. organic production. California, for example, requires registration but not certification, and certified organic farms represented less than half of all registered organic farms in 1995 (Torte and Klonsky, 1998). USDA excluded noncertified production because of the difficulty in “determining whether or not uncertified producers are farming organically according to a defined set of production criteria” (Dunn, 1995a). Also, some producers obtain certification from more than one certifying agency, and double-certified acreage was excluded whenever possible to avoid double-counting. This report follows similar procedures, analyzing data from State and private certifiers, excluding uncertified production, and excluding double-certified acreage whenever possible.

A list of 51 organic certification groups operating in the United States in 1997 was compiled from various national organic industry directories (Appropriate Technology Transfer for Rural Areas; California Alliance with Family Farmers; Organic Farming Research Foundation; and Organic Trade Association). These certification groups were contacted to determine if they certified farmers and were active in 1997. Several had become inactive or were not yet active in 1997, some provided support services but not certification, others certified processors but not farmers, and several could not be reached by phone or by mail. Forty of these 51 certification organizations were determined to be actively certifying farmers in 1997 (table 2).

Membership directories, acreage reports, and other sources of certified acreage and livestock data were obtained from these 40 certifiers to estimate certified acreage in 1997 by State and for major crops. The California Agricultural Statistics Service calculated the acreage and livestock numbers certified by one major certifier based on the office records of that organization. Data from all of the certifiers were sorted into the major crop and livestock sectors defined by the Census of Agriculture, and acreage of the major commodities within each farm sector was also calculated.

The format of acreage and livestock data in certifier reports varied substantially. Most reports showed an acreage breakdown by crop and by State or by farm (some down to a tenth of an acre). Some showed an acreage breakdown by farm but not by crop. Others showed acreage for major categories of crop and livestock production but not for individual commodities.

Eleven of the private certifiers provided certification services in more than one State in 1997. Several of these certifiers provided services in only a couple of adjacent States, but 3 of them provided services in 20 States or more. The acreage reports and other data sources for most of these national certifiers, particularly the larger ones, showed crop acreage and livestock numbers by State.

Certified organic acreage and livestock estimates were calculated by State and by commodity for 1997 with several exceptions. First, several certifiers had replaced 1997 data records with data for 1998, and their 1998 data were used in this report. Second, data that could not be broken down by commodity are reported in aggregate. The amount of acreage that could not be classified by commodity varied by farm sector (9 percent of grain acreage; 4 percent of legume acreage; 40 percent of oilseed and hay acreage; 38 percent of vegetable acreage; and 21 percent of fruit acreage). Finally, some data could not be classified by State (well under 1 percent of the total) and are included in a regional category.

assistance for certification costs (U.S. Department of Agriculture, 2000b).

Additional public and private research is needed on many aspects of organic production and marketing in the United States. What are the primary incentives that motivate farmers to switch from conventional to organic farming systems? How much labor is used under organic farming systems, and how is it integrated into these systems? Who are the primary U.S. organic consumers currently, and how responsive will these and other consumers be to organic labeling changes and to changes in the price and availability of organic food? What would the economic impacts and social benefits be under widespread adoption of organic farming systems? Additional research is also needed on how to improve organic farming systems from an economic and social perspective, as well as from agronomic and ecological perspectives. The extent of the national research agenda on organic agriculture, along with program and policy initiatives, will help shape the role that organic farming systems play in U.S. agriculture in the decades ahead.

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