Working Draft

Agricultural Handbook for Vermont Counties

Compiled and Edited by:
Ken Becker,
Fred Schmidt,
Will Sawyer,
Mike Moser

August 2005

Center for Rural Studies
207 Morrill Hall,
University of Vermont
Burlington, VT 05405

View resources on the Web at: http://crs.uvm.edu/

Table of Contents

nlights of 1992 and 2002 Agricultural Census Data for Vermont

Key Statistics	**1992**	**2002**
Number of Farms	5,436	6,571
Market Value of Ag Products Sold	$415,253,000	$473,065,000
Net cash return from ag sales	$71,810,000	$101,678,000
Harvested crop acreage	477,020	454,699
Dairy cow numbers	168,473	150,626
Number of dairy farms	2,373	1,508
All crops (including vegetable and nursery) as a percent of the total market value of agricultural products	9%	15%

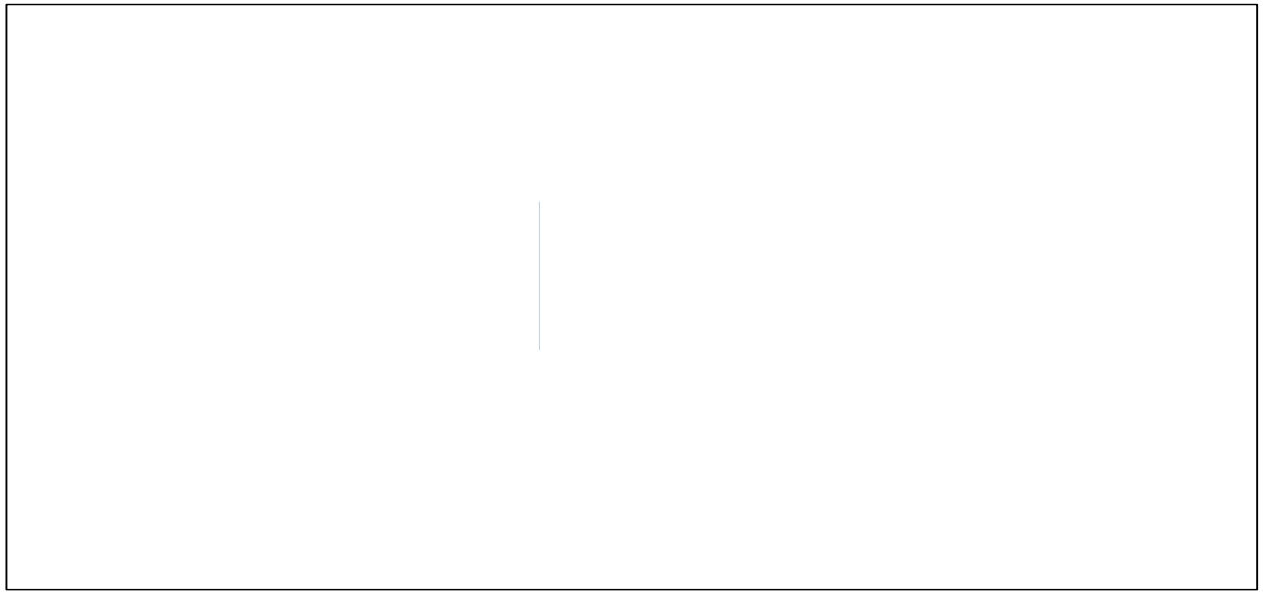


Table 1. Historical Profile of Vermont Agriculture, 1850-2002

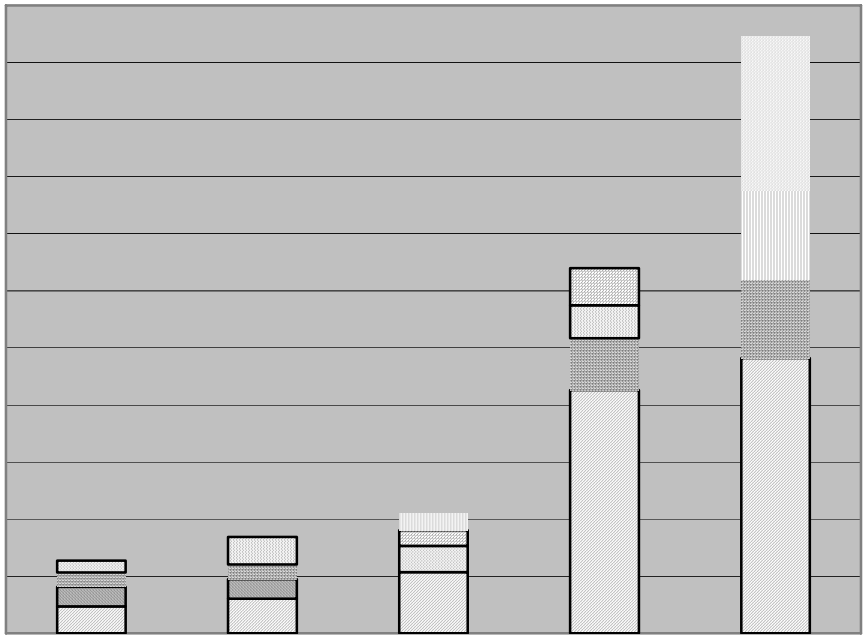
Table 1. Historical profile of Vermont Agriculture, 1850-2002

Year	Census Population Estimate	Number of Farms	Total farm acreage	Total cropland acreage	Percent of all VT land in farms*	Percent of land in farms in cropland	Percent of 1880 farms	Percent of 1880 acres in farms	Average acres per farm
2002	616,500	6,571	1,244,909	567,509	21.0%	45.6%	18.5%	25.5%	189
1992	570,115	5,436	1,278,525	658,765	21.6%	51.5%	15.3%	26.2%	235
1987	548,000	5,887	1,407,868	707,970	23.8%	50.3%	16.6%	28.8%	240
1982	516,000	6,315	1,574,441	772,055	26.6%	49.0%	17.8%	32.2%	249
1978	498,000	5,852	1,633,049	806,244	27.6%	49.4%	16.5%	33.4%	279
1974	473,000	5,906	1,667,561	779,344	28.2%	46.7%	16.6%	34.2%	282
1970	444,732	6,874	1,915,520	836,246	32.4%	43.7%	19.4%	39.2%	279
1960	389,881	12,099	2,945,343	1,028,203	49.8%	34.9%	34.1%	60.3%	243

Graph 1. Cash Receipts Over Time of Vermont's Top Four Agricultural Commodities After Dairy

Dairy dominated Vermont’s agricultural commodities for the data points presented on the following page. After removing dairy from the data set it is easier to see trends occurring in the next top four commodities for the selected years. It should also be noted that data for the greenhouse/nursery commodities began being collected in 1992 and thus is not presented in the earlier data sets.

Graph 1. Cash Receipts Over Time of Vermont's Top Four Agricultural Commodities After Dairy



II. Farm Characteristics

Table 2. Farms Inventory

In the decade from 1992 to 2002, farm numbers in Vermont

Table 2. Farms inventory

	Number of farms			Acres of land in farms			Average size of farms (Acres)		
	1992	**2002**	**% Change**	**1992**	**2002**	**% Change**	**1992**	**2002**	**% Change**
Addison	683	676	-1.0%	209,677	193,376	-7.8%	307	286	-6.8%
Bennington	154	228	48.1%	33,682	41,126	22.1%	219	180	-17.8%
Caledonia	430	505	17.4%	96,704	84,318	-12.8%	225	167	-25.8%
Chittenden	405	473	16.8%	82,849	76,679	-7.4%	205	162	-21.0%
Essex	74	98	32.4%	17,710	19,838	12.0%	239	202	-15.5%
Franklin	728	770	5.8%	203,503	190,115	-6.6%	280	247	-11.8%
Grand Isle	108	99	-8.3%	24,848	16,289	-34.4%	230	165	-28.3%
Lamoille	227	317	39.6%	41,348	53,820	30.2%			

Table 3. Farms by Size

During the last decade, there were dramatic increases in farms over 1,000 acres (up 72%) and those under 50 acres (up 115%). The more traditionally sized farms found in the middle 180 to 999 acre category declined approximately 22%.

Table 3. Farms by Size

	1 to 9 acres	10 to 49 acres	50 to 179 acres	180 to 499 acres	500 to 999 acres	1,000 acres or more
1992						

Table 4. Farm Valuation

Real estate values have appreciated substantially in the past decade, with the greatest impact on agriculture being felt in the north and western parts of the state. Rutland County experienced the greatest percentage change in farmland value with a 42.8% increase. Lamoille County followed closely behind with a 40.9% increase in average value of real estate per farm. Orleans, Windsor, Franklin, Addison and Grand Isle Counties all had average per farm value increases of around 30% or more, and all exceeded the average increase in the state as a whole.

Table 4. Farm Valuation

	Estimated market value of land and buildings		Estimated market value of all machinery and equipment
	Average per farm (dollars)	Average per acre (dollars)	Average per farm (dollars)
	1992	**2002**	

III. Market Value of Agricultural Products

Table 5. Farm Expenses and Income

Production expenses per farm were highest in the three dairy Counties of Franklin ($95,000), Addison ($90,000) and Orleans ($51,000).

The greatest rates of change in farm expenses were recorded in Windsor (+72%), Windham (+62%), and Orange (+60%) Counties.

Since Average Expenses per Farm Unit can be used as a proxy to identify the size of individual farm operations, the largest farms in the state are in Addison, Franklin, Orleans and Grand Isle Counties. Meanwhile the smallest average farm sizes are found in Windsor, Washington, Bennington, Rutland and Lamoille Counties.

Productivity of farming regions is measured by the net cash return from agricultural sales for the whole county. By this measure, Franklin, Addison, and Orleans Counties far outrank all other regions of the state. In fact the net cash return from agricultural sales is almost as high in these three Counties ($68 million) as in all the rest of the state combined ($74 million).

The most profitable farms, as measured by net cash return from agricultural sales per farm unit, were in the large dairy producing areas of Addison, Franklin, and Orleans Counties.

Profitability increased most dramatically in Chittenden (+151%), Essex (+62%), and Grand Isle (+52%) Counties followed by the three dairy Counties of Addison, Orleans, and Franklin. Profitability declined in Windsor (the only county to have negative net cash farm returns in both 1992 and 2002), Lamoille, Rutland and Bennington Counties.

Table 5. Farm Expenses and Income

	Production expenses		Net cash income of operation
	Total production expenses (Thousands of dollars)	Average expenses	

Table 6. Farms by Value of Sales

In 2002, 41% of all farms had sales of less than $2,500 and 18% of farms had sales of more than $100,000. The remaining 41% of farms fall in the middle categories of sales between $2,500 and $100,000.

There was a 102% increase in the number of farms in the lowest category of sales (less than $2,500). Altogether, there were 1,750 more farms in 2002 with annual sales below $50,000 than there were in 1992.

The number of farms in the two highest sales categories ($50,000 to $99,999 and more than $100,000) had declines of 44.6% and 20.3%, respectively. There were 615 fewer farms with sales in excess of $50,000 in 2002 than existed in 1992.

This data does not reveal the percentage of total agricultural production by farms of various sizes. While the majority of farms fall in the smallest value of sales categories, it is likely that the majority of total agricultural sales occur on farms with sales in excess of $100,000. In the future, more categories above the $100,000 thresh hold and fewer categories below that level would be more revealing about the range and scope of individual farm sizes and their contribution to the total value of agricultural production in the state.

Table 6. Farms by Value of Sales

	Less than $2,500			$2,500 to $4,999			$5,000 to $9,999			$10,000 to $24,999			$25,000 to $49,999			$50,000 to $99,999			$100,000 or more		
	1992	**2002**	**% Change**	**1992**	**2002**	**% Change**	**1992**	**2002**	**% Change**	**1992**	**2002**	**% Change**	**1992**	**2002**	**% Change**	**1992**	**2002**	**% Change**	**1992**	**2002**	**% Change**
Addison	110	227	106.4%	40	51	27.5%	49	51	4.1%	56	44	-21.4%	29	42	44.8%	84	45	-46.4%	315	216	-31.4%
Bennington	57	120	110.5%	22	22	0.0%	21	17	-19.0%	17	34	100.0%	7	12	71.4%	10	8	-20.0%	20	15	-25.0%
Caledonia	111	204	83.8%	55	57	3.6%	53	54	1.9%	24	59	145.8%	29	27	-6.9%	72	32	-55.6%	86	72	-16.3%
Chittenden	111	198	78.4%	56	60	7.1%	61	37													

Table 7. Market Value of Agricultural Products Sold

Not surprisingly, market value of agricultural products is greatest in the dairy Counties of Franklin, Addison and Orleans Counties. Also not surprisingly, market value of agricultural products is lowest in Essex and Bennington Counties. Livestock sales exceed $100 million in Franklin County and stand at $95 million and $54 million in Addison and Orleans Counties, respectively. Value of livestock sales have increased most dramatically in Franklin, Orange and Addison Counties, while declines have been experienced in Lamoille, Rutland, Caledonia, and Washington Counties.

The greatest changes in market value of agricultural product sales occurred in Chittenden County (+31%), Windham County (+30%), and Orange County (+29%), presumably attributable to growing sales of crops including vegetable, greenhouse and nursery growth. Sales of all crops exceed $6 million per year in the above three Counties as well as Addison and Franklin Counties.

As a percentage of the total market value of agricultural products, livestock products are most concentrated in Orleans, Franklin and Addison Counties (all at or above 90% of all sales represented by livestock sales), and lowest in Windham, Chittenden, Windsor, and Bennington Counties (all at or above 30% of all sales represented by crop sales).

For the state in 2002, livestock products represent 85% of the market value of agricultural products sold and all crops represent 15% of agricultural sales. In 1992, livestock products were 91% and all crops were 9% of total agricultural sales. This change denotes a substantial increase in the relative value and importance of crops (primarily vegetables and nursery crops) as a percentage of the total market value of agricultural products.

IV. Operator Characteristics

Table 8. Farm Operator Characteristics

Table 8. Farm Operator Characteristics

The total number of farm operations in Vermont where farming is the primary activity of the operator has remained relatively stable at approximately 3,500 farms. Over the last decade, this number has declined by less than 1%.

On the other hand, the number of operations where the principal operator works at least some days off the farm has increased nearly 50%, with most of this increase coming from operations run by part-time farmers working more than 200 days off the farm (such farms increasing more than 76%).

The greatest increase in operations run as the primary occupation of the operator has occurred in Bennington and Windham Counties (62% and 31%, respectively). The number of farms where farming is the primary occupation of the operator is greatest in Franklin (504), Addison (405), Orleans (395), Rutland (312), Windsor (311), and Orange (304) Counties.

Decreases in farms run as the primary occupation of the operator have occurred in Grand Isle, Addison, Franklin, Caledonia, Orleans, and Orange Counties.

The greatest number of part-time farms (as measured by principal operator working 200 or more days off the farm) are in Orange (301), Rutland (268), Franklin (242), and Windsor (240) Counties.

Table 8. Farm Operator Characteristics

	Operators by primary occupation						Principal operator by days worked off farm					
	Farming			Other			Any days worked off farm			200 days or more off farm		
	1992	2002	% Change	1992	2002	% Change	1992	2002	% Change	1992	2002	% Change
Addison	499	405	-18.8%	184	271	47.3%	236	316	33.9%	129	208	61.2%
Bennington	80	130	62.5%	74	98	32.4%	80	122	52.5%	53	99	86.8%
Caledonia	271	250	-7.7%	159	255	60.4%	203	275	35.5%	114	193	69.3%
Chittenden	220	222	0.9%	185	251	35.7%	192	280	45.8%	123	192	56.1%
Essex	50	51										

V. Cropland and Crops Harvested Characteristics

Table 9. Croplands inventory

Total cropland inventory in the state has declined nearly 14% in the last decade by 91,256 acres. Harvested cropland

Table 10. Vegetables Harvested for Sale

As a percentage of harvested cropland acreage in the state, vegetable production occurs less than 1% of available acreage. Nevertheless, there has been a 14% increase in total acreage devoted to vegetable production in the past ten years, increasing from 2,500 acres to 2,900 acres. Chittenden County continues to rank first in the state in terms of total acres of land used for vegetables (515 acres). Windsor County had the most vegetable farms (45) followed by Chittenden County (41).

For Counties that had at least 10 vegetable farms in 1992, Lamoille County saw the greatest increase in vegetable farming activity with double the number of farms. The number of vegetable farms in Addison and Caledonia Counties grew by 64.5% and 61% respectively with a corresponding near doubling of acreage devoted to vegetable production in each of these Counties.

Overall, Vermont experienced about a 25% increase in vegetable farm operations in the past decade, with more than 400 operations as of 2002.

Average number of acres per vegetable operation was highest in Chittenden County at 13, followed by Franklin (9), Grand Isle (9) and Lamoille, Orange, Windham, and Rutland at 8 acres average per farm, each.

Table 10. Vegetables Harvested for Sale inventory

	Number of farms harvesting vegetables for sale			Acres of land used for vegetables for sale		
	1992	**2002**	**% Change**	**1992**	**2002**	**% Change**
Addison	31	51	64.5%	132	258	95.5%
Bennington	19	17	-10.5%	120	76	-36.7%
Caledonia	23	37	60.9%	90	168	86.7%
Chittenden	30	41	36.7%	546	515	-5.7%
Essex	1	3	200.0%	(D)	(D)	NA
Franklin	17	22	29.4%	101	193	91.1%
Grand Isle	11	10	-9.1%	71	85	19.7%
Lamoille	10	20	100.0%	(D)	169	NA
Orange	22	34	54.5%	197	276	40.1%
Orleans	21	22	4.8%	50	(D)	NA
Rutland	38	38	0.0%	304	300	-1.3%
Washington	30	34	13.3%	296	253	-14.5%
Windham	34	39	14.7%	344	303	-11.9%
Windsor	43	45		240	228	-5.0%

Table 11. Orchards inventory

Over the ten-year period, acres of land devoted to orchards declined by 27% or 1,342 fewer acres. Over half of this decrease occurred in Addison County (-795 acres). Orchard acreage continues to be highest in Addison County (1,328 acres) more than double the next highest county (Windham at 643 acres).

The total number of farms with land in orchard remained stable at about 260 operations.

Orange County had the greatest percentage decrease in orchard acreage dropping 64% or 131 acres.

Table 12. Oats Harvested

Oats are a relatively minor crop for the state in terms of both acreage and productio

Oats inventory

Number of farms producing Oats for grain			Acres of land used for Oats for grain			Bushels of Oats for grain		
1992	**2002**	**% Change**	**1992**	**2002**	**% Change**	**1992**	**2002**	**% Change**
10	8	-20.0%	198	125	-36.9%	9,869	4,396	-55.5%

Table 13. Hay and Haylage, Alfalfa, Grass Silage, and Green Chop Hay

By 2002, Vermont had 14% fewer acres, but saw a 31% increase in total hay crop production. This signifies dramatic changes in management practices resulting in higher yields per acre. Management changes responsible for these yield increases probably include a gradual shift from grass species toward legumes, increased number of cuttings per season, and improved fertilization of hay land fo

Table 13. Hay and Haylage, Alfalfa, Grass Silage, and Green Chop Hay inventory

	Number of farms			Acres of land			Dry tons		
	1992	**2002**	**% Change**	**1992**	**2002**	**% Change**	**1992**	**2002**	**% Change**
Addison	538	401	-25.5%	95,434	80,608	-15.5%	182,218	257,010	41.0%
Bennington	103	75	-27.2%	7,684	7,089	-7.7%	14,098	14,791	4.9%
Caledonia									

Table 14. Corn Harvested for Grain or Seed

Grain corn production represents less than 5% of total corn harvested and only about 1% of harvested cropland in the state. There were 30% fewer acres devoted to grain corn in 2002 than in 1992.

Table 14. Corn for Grain or Seed inventory

	Number of farms			Acres of Land			Bushels			Bushels per Acre		
	1992	**2002**	**% Change**	**1992**	**2002**	**% Change**	**1992**	**2002**	**% Change**	**1992**	**2002**	**% Change**
Addison	44	20	-54.5%	3,370	1,279	-62.0%	321,902	153,559	-52.3%	95.5	120.1	25.7%
Bennington	9	6	-33.3%	301	69	-77.1%	36,958	7,620	-79.4%	122.8	110.4	-10.1%
Caledonia	6	3	-50.0%	106	(D)	NA	10,890	(D)	NA	102.7	NA	NA
Chittenden	11		-36.4%	662	331	-50.0%	72,482	42,367		109.5	128.0	16.9%

Table 15. Corn Harvested for Silage or Green Chop

Over the past ten years, there has been a 6% increase in acreage (about 5,300 more acres) with a 9% increase in total production. Yield of corn silage (tons per acre) has increased 3% from 15.8 tons in 1992 to 16.3 tons in 2002 statewide. The highest yielding region of the state is Windham County with nearly 22 tons per acre, presumably due to well drained soils in the Connecticut River Valley and a longer growing season than most other regions of the state.

Overall, corn silage production represents 20% of 2002 cropland harvested in Vermont, which is up from 18% in 1992. Corn silage is primarily grown to feed the state's dairy herd, so corn silage acreage is concentrated in the three dairy Counties: 25,300 acres in Franklin, 24,300 acres in Addison and 10,200 acres in Orleans Counties. These three Counties represent two thirds of all corn silage acreage in the state.

Franklin County has the most farms growing corn silage (198) followed by Asoils %state.

Table 15. Corn for Silage or Green Chop inventory

	Number of farms			Acres of land			Tons (green)	Tons per Acre
	19		% Change	1992	2002	% Change	1992	

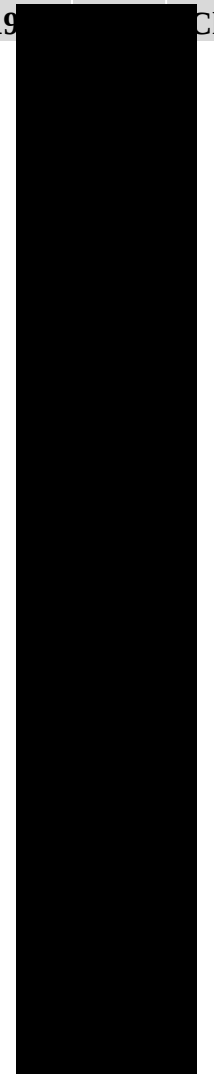


Table 16. Nursery, Greenhouse, Floriculture, Mushrooms, Sod, and Vegetable Seeds Grown for Sale

These agricultural products represent the big story about the changing face of agriculture in Vermont over the last decade. Statistics were not even maintained on these crops prior to 2002. There are now 432 such operations, with 558 acres in the open and more than 2.2 million square feet in greenhouse space. If the data was available, it is expected that the dollar value of total production from these operations would be substantial and represent a significant portion of the total growth in agricultural value output.

The largest average size of greenhouse operators (measured by square feet under protection per farm) are in Chittenden (10,700 sq. ft.), Bennington (6,274 sq. ft.), and Orange (6,067 sq. ft.) Counties.

The largest operators (in terms of acres in the open per farm) are in Lamoille (2.7), Washington, (2.2), and Chittenden and Orleans Counties (2.0 acres each).

The most farms are in Windham (65), Addison and Chittenden (42 each), Orange (37) and Windsor (36) Counties.

The most greenhouse space is in Chittenden, followed by Windham and Orange Counties.

The most acres in the open are in Chittenden, followed by Washington and Orleans Counties.

Addison	NA	42	NA	NA	149,026	NA	NA	32	NA

VI. Livestock Inventories

Table 17. Cattle and Calves Inventory

The cattle and calves inventory is not a terribly enlightening statistic because it appears to combine beef and milk cows, adult animals and replacements. Most of these animals are found on Vermont's dairy farms. The number of farms producing and selling cattle has declined while the total cattle inventory has also declined, but at a more gradual rate. As a result, the average size of the remaining cattle farms has increased. For a more thorough analysis of dairy cattle inventory, see Table 18.

Table 17. Cattle and Calves inventory

Table 18. Beef Cow Inventory

Compared to ten years earlier, there are about 50 more beef operations (a 5% increase in farms) raising 500 fewer animals. With only slightly more than 11,000 animals in the whole state, the average beef operation is very small in Vermont having only 10 animals per farm. The average number of animals per farm varies little across the Counties.

The most animals are in Windsor, Rutland, Orange, and Addison Counties, with those four Counties representing 51% of the state's entire beef herd.

Table 18. Beef C

	Number of fa	
	1992	
Addison	97	
Bennington	44	

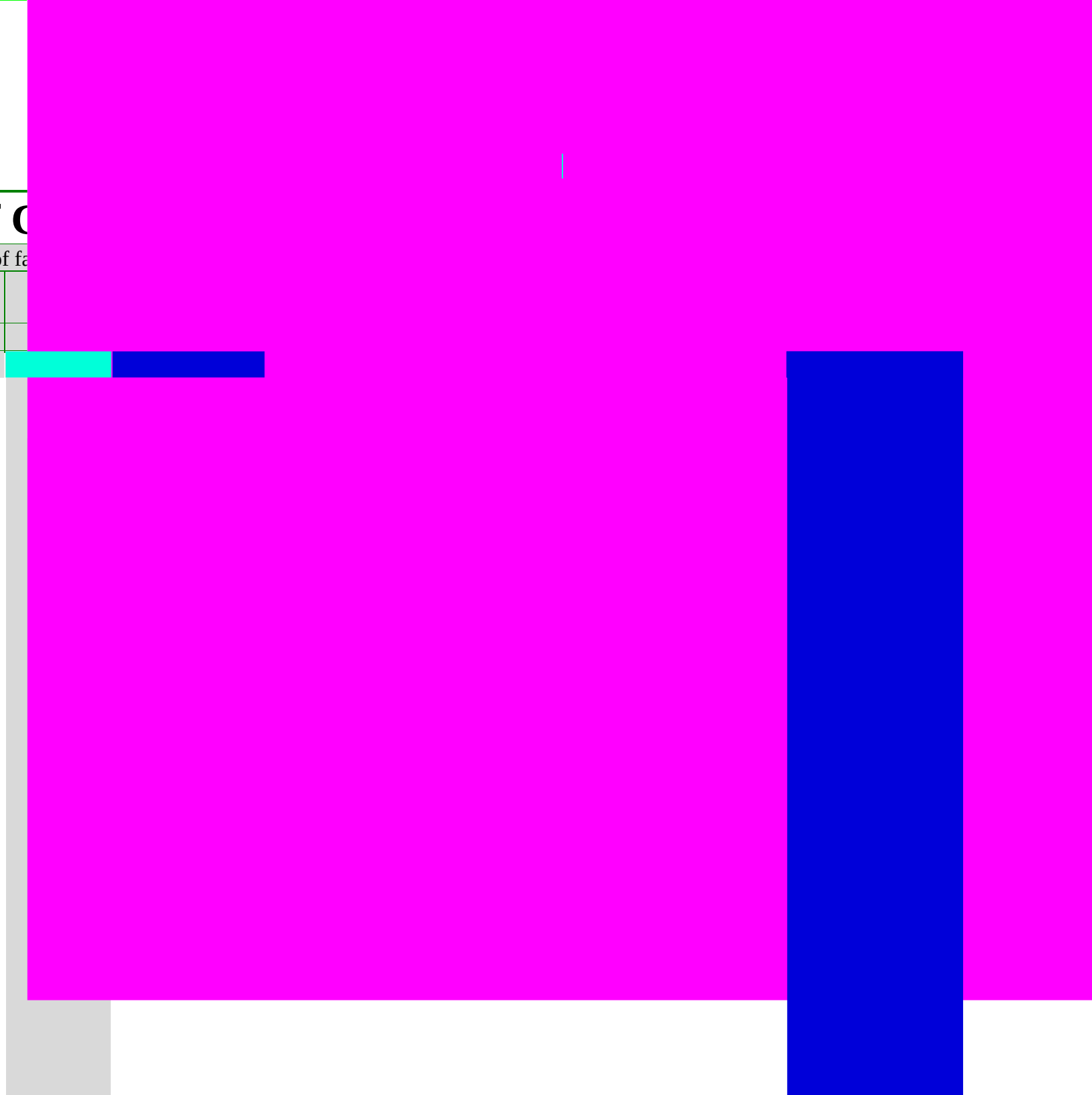


Table 19. Milk Cows Inventory

Vermont agriculture has been led by milk production for over a century and dairy cattle continue to exert their influence in 2002. Three Counties, Franklin, Addison and Orleans, represent 64% of all the milk cows in the state. Franklin County has the most cows (40,500) followed by Addison (32,800) and Orleans (22,800).

The fewest dairy cows are found in Bennington and Essex Counties.

Vermont's dairy farm numbers have declined 36.5% (from 2,373 to 1,508) over the past ten years, with a less gradual decline in the total dairy herd from 168,500 cows to 150,600 (a 10.6% decline in cow numbers). As a result, the state has experienced an increasing size for its dairy farms from 71 milk cows per farm on average to 100 milk cows. The largest average sized farms are found in Addison (148 cows), Frankl

k Cows inventory

	f farms producing milk cows		Number of milk cows			Average milk cows per farm		
	2002	**% Change**	**1992**	**2002**	**% Change**	**1992**	**2002**	**% Change**
	222	-39.2%	34,912	32,797	-6.1%	95.6	147.7	54.5%
	24							

Table 20. Sheep and Lambs Inventory

The sheep industry has declined over the last decade with 6% more farms in 2002 (29 more farms) producing 14% fewer animals than in 1992. Windham County continues to have the most sheep.

Table 20. Sheep and Lambs inventory

	Number of farms producing sheep and lambs			Number of sheep and lambs		
	1992	**2002**	**% Change**	**1992**	**2002**	**% Change**
Addison	47	56	19.1%	2,113	1,737	-17.8%
Bennington	31	30	-3.2%	622	626	0.6%

Table 21. Poultry Inventory

Two or three commercially sized layer operations in Vermont represent 85% of all the layers present in 2002. Turkey production is also concentrated on less than half a dozen farms in the state. Because production is concentrated on a relatively few farms, most of this data is withheld to protect the confidentiality of the individual operators.

s selling -type chickens		Number of broilers and other meat-type chickens sold		
% Change		**1992**	**2002**	**% Change**
200.0%		745	(D)	NA
-66.7%		(D)	(D)	NA
550.0%				

Chittenden	28	68	142.9%	(D)	1,382	NA	4	14	

Table 22. Hogs and Pigs Inventory

The swine industry is not a significant economic presence in the state. 206 farms produced 2,019 hogs, or less than 10 hogs per farm. Swine production appears to be a part-time enterprise, perhaps in conjunction with other enterprises within diversified farming operations.