



Natural Capital Science Report



THE 2010 MASSACHUSETTS DAIRY PROMOTION BOARD DAIRY FARM IMPACT SURVEY:

SURVEY RESULTS

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Executive Summary

To better assess the contributions and impacts of dairy farms and the importance of state and federal programs to dairy agriculture, Manomet worked with the Massachusetts Dairy Promotion Board (MDPB) to randomly survey 100 Massachusetts (MA) dairy farmers. This report summarizes the survey responses from the 43 farmers who responded. It uses survey results and benchmark statistics from other sources to describe how MA dairy farms affect local economies and communities, their conservation practices, and the importance of existing state and federal programs.

Survey Representativeness and Farm Size

- MDPB survey farmers reported herd sizes, gross sales, and regional distribution that were similar to results from other surveys of MA dairy farms. Therefore, the MDPB survey results were representative of MA dairy farms, their impacts, and their practices.
- The land area of farms reported by MDPB survey farmers was smaller in land area than U.S. dairy farms and was more than one-third forested.
- The herd size of MDPB survey farms was about 27% smaller than the average U.S. herd size.

Economic Conditions on Dairy Farms

- In 2010, almost 40% of MDPB survey farmers reported that they were not able to cover milk production costs due to low market prices.

Economic Impacts

- MDPB survey farmers reported paying on average \$10,350 for local taxes, more property taxes than other MA farmers and U.S. farmers. They reported tax contributions in over 25% of MA municipalities.
- The average reported gross sales of MDPB survey farms was <50% of the U.S. average, \$786,000.
- Off-farm employment was economically important to MDPB survey farmers. However, while 64.2% of MDPB survey farm families had off-farm income, over 93% of U.S. farm families had off-farm income. This difference may have occurred because dairy agriculture requires a higher level of skilled labor than other types of farms and so is more dependent on family members working on-farm.
- MDPB survey farms reported mostly purchasing supplies and services from local businesses and spent nearly two-thirds of their expenditures (59%) within MA.

Benefits to Local Communities

- MA dairy farms were important to local food production. MA dairy farms produced an estimated 18% of the milk consumed in the state in 2007. Over 25% of MDPB survey farmers reported selling other food products to consumers, including meat, dairy products, eggs, maple syrup, vegetables, baked goods, honey, and fruits.
- About 80% of MDPB survey farms reported volunteering their time, far greater than the volunteer rate of 26.3% for MA residents in 2009. They reported volunteering an average of 90 hours/year, far greater than the average volunteering of 27 hours/year for MA residents in 2009.
- About 50% of MDPB survey farmers reported making charitable contributions, averaging about \$725 in 2010.
- MDPB survey farmers reported visitation rates for tours that were about 25% of the visitation rates for some national parks in the lower 48 states.
- Most MDPB survey farmers (98%) reported employing at least one practice to be a good neighbor. Almost three-quarters of MDPB survey farmers indicated that local communities were supportive or very supportive of local dairy farming.
- About 75% of MDPB survey farmers reported providing public recreational access to their land, in contrast to only 12.6% of forest landowners in the U.S. They reported an average of 5.3 recreational visitors/acre/year, which compares favorably with the average visitation levels in U.S. national parks of 9.8 visitors/acre/year. Statewide, MA dairy farms provided recreational access to an estimated 37,000 acres.
- MDPB survey farmers reported that their farms are multi-generational, staying in a family for an average of three generations and up to 13 generations.
- Although about two-thirds of MDPB survey farmers reported planning to transfer their farm to the next generation, only about half reported having a transfer plan. Only about 13% of the dairy farmers reported having a written plan transferring their farm to the next generation, which was much lower than the 2003 national average of 27%.
- About 67% of MDPB survey farmers reported maintaining farm buildings >60 years old which were visual reminders of local agricultural heritage, more than double the national average for all U.S. farms. Over 90% of MDPB survey farmers reported applying more than one practice to enhance the scenic appeal of their farm in 2010.

Environmental Conservation

- MDPB survey farmers reported their use of twelve conservation programs that support the use of conservation practices and reduce their property tax burden. About one-third of MDPB survey farmers reported using EQIP compared with <1% of U.S. farmers.
- About 50% of the MDPB survey farmers reported having a state or NRCS-approved nutrient management plan in 2010, a level much greater than the 8.8% of U.S. corn farmers who use nutrient management plans. Nearly all MDPB survey farmers reported applying best management practices (BMPs) to conserve soils and use agriculture chemicals appropriately.
- Eighty percent of MDPB survey farmers reported testing soils frequently enough to help ensure best management of nutrients and manure.
- Almost 60% of MDPB survey farmers reported using no-till, which was much greater than the 34% of U.S. corn farmers who used conservation tillage including no-till. About 30% of MDPB survey farmers reported using buffers along waterways, which was at a level much greater than U.S. family farm in 2001 (8%). Over 90% of the MDPB survey farmers reported applying practices to minimize nutrient run off and protect water quality.
- Forty-six percent of MDPB survey farmers reported managing some portion of their farm for wildlife, which was much greater than a similar statistic of 4% of U.S. family farmers who enhanced their land for wildlife. This amounts to an estimated total 23,000 acres of wildlife habitat.
- Over 65% of MDPB survey farmers reported using alternative energy sources. They reported using alternative energy such as wind, solar, and/or methane digesters more frequently than other New England farmers and U.S. farmers.
- Nearly all MDPB survey farmers reported applying energy conservation measures in the last 5 years. MDPB survey farmers reported much more frequent use of renewable energy and energy conservation practices than regional and U.S. farms.

Importance of State and Federal Farm Programs

- Nearly all MDPB survey farmers (95%) reported that the MA Dairy Farmer Tax Credit Program in 2008 and 2009 was important for maintaining the economic viability of their farm. MDPB survey farmers primarily reported using their income tax credit to pay for operating costs. This program helps dairy farmers when wholesale markets do not pay dairy farmers what it costs them to produce milk.
- MDPB survey farmers indicated >20% enrollment in the MA Agriculture Preservation Restriction (MAPR) Program and in the MA Agricultural Environmental Enhancement Program (MAEEP). These two programs were also identified by many MDPB survey farmers as being important to the economic viability of their farms. In the MAPR Program, the Commonwealth buys a conservation restriction (an easement) from the landowner, which reduces property taxes and development pressure on farmland. The MAEEP provides support for practices that reduce emissions, energy use and costs, and meet clean water standards.
- About 90% of MDPB survey farmers reported enrollment in one or more of twelve state or federal conservation programs to improve farming practices or reduce environmental impacts.

Introduction

Dairy agriculture is important to the economy, local communities, and environment of Massachusetts (MA) in many ways. Milk and other dairy products from cows are the fourth most economically important agriculture products in MA (USDA National Agriculture Statistics Service 2007). In 2007, their sales were worth \$50.5 million and accounted for 10.3% of the total value of agriculture products sold in MA. In 2010, MA had 157 dairy farms (MDAR Division of Animal Health, unpublished data), which produced 244 million pounds of milk in 2010 (USDA National Agricultural Statistics Service 2011a). The supply chains of dairy products also create additional downstream jobs. Upstream, dairy farms also pay service providers, including feed suppliers, veterinary services, equipment suppliers, and financial services, which generate additional economic value. The total economic impact of dairy may be more than several times the value of gross sales, as has been found in nearby Connecticut (CT DECD 2009).

MA dairy farms also have significant impacts on local communities and ecosystem services. They produce dairy products, other local foods, and agricultural products. They significantly contribute to MA food security by producing over 18% of milk consumed by the state's consumers in 2007¹.

MA dairy farms have a large impact on quality of life in local communities. Dairy farms can provide significant local open space benefits (CT DECD 2009). MA dairy farms also help conserve over \$600 million of non-market value in the form of ecosystem services such as open space, clean water, scenic views, wildlife habitat, food production, wood products, and real estate values for local communities (Breunig 2003).

To better assess the contributions and impacts of dairy farms and the importance of state and federal farm programs to dairy agriculture, Manomet worked with the MA Dairy Promotion Board (MDPB) to randomly survey 100 MA dairy farmers. This report uses survey results and benchmark statistics from other sources to describe how MA dairy farms affect local economies and communities, their conservation practices, and the importance of existing state and federal programs.

This report first compares results from the MDPB survey to results from other MA dairy farm surveys to determine whether the overall results of the MDPB survey were representative of all MA dairy farms. It then summarizes the MDPB survey results and describes the impacts of dairy farms on the MA economy, local communities, and environment. It includes benchmark statistics from the USDA and other sources to make the results more meaningful. There are sections covering 24 topics. Each section lists survey questions associated with the topic, statistically summarizes the response to these questions through text and figures, and highlights key points, including comparisons with other studies. A copy of the MDPB survey can be found at the end of the report in Appendix A. A full discussion and synthesis of these results can be found in Whitman (2011).



¹ 244 million lbs. of milk produced in Massachusetts (USDA National Agricultural Statistics Service 2011a); estimated milk consumption = 1335.7 million lbs. (6,547,629 people in Massachusetts in 2010 [U.S. Census Bureau 2011] X estimated annual U.S. per capita milk consumption of 204 lbs [USDA National Agricultural Statistics Service 2011b]).

Methods

Development of the Survey: Manomet developed, with assistance from MDPB, a dairy farmer survey composed of 59 questions (see Appendix A for the survey). We included questions regarding practices outlined in the Vital Capital Index for Dairy Agriculture (Whitman and Clark 2010). The survey included questions about dairy farms (e.g., milking herd size, acreage), their effect on local economies, production of agricultural goods, neighbor relations, contributions to local communities, conservation of land and agricultural heritage, and farm stewardship.

Survey Methods: We randomly selected 100 farmers from a mailing list of 157 MA dairy farmers to create a probabilistic survey. This list includes nearly all MA dairy farms. Our goal was to receive ≥ 40 responses (a 40% return rate). The survey was mailed to farmers on March 24, 2011, with a cover letter from the MDPB explaining the purpose of the survey. We sent a postcard one week later to remind farmers to complete the survey. We mailed the survey again on April 12, 2011, to non-responding farmers with a cover letter from the MDPB explaining the purpose of the survey. We also telephoned non-responding farmers. We received 46 surveys back from farmers (a 46% return rate). Three surveys were blank and discarded from the analysis.

All surveys are at risk to errors, including coverage errors, sampling error, measurement error, and non-response errors (Dillman 2007), which can be largely overcome with

proper survey development and deployment (Dillman 2007). We avoided coverage errors by selecting farms for the survey from the entire list of MA dairy farms. We assessed sampling error by comparing our survey data to other data sources and found that our survey farms were indistinguishable in size, gross sales, and regional location found by other surveys of MA dairy farms. We avoided measurement error (e.g., inaccurate or imprecise answers by respondents due to confusing questions) by having a panel of dairy farmers review the survey questions to ensure that the average dairy farmer would correctly interpret questions and provide the appropriate response. We avoided non-response errors by contacting the survey farmers several times to ensure a high response rate. Moreover, most farmers who completed the surveys had a $>85\%$ response rate for most questions.

Analysis and Statistics: We applied statistical procedures cited in the results using SAS statistical software, v. 9.1 (2010), Sigma Plot graphics software, v. 9.0 (2004), and Zar (1999) for the analyses. This included: (1) one-sample t-tests to compare the mean value from continuous data to mean values from other sources, (2) Kolmogorov-Smirnov tests to compare the distribution of survey data to distributions from other sources, and (3) confidence limits to compare survey percentages with percentages from other sources.



Results

Survey Representativeness

We compared the MDPB survey farms with MA dairy farm statistics from two other sources to determine whether the MDPB survey results were representative of MA dairy farms. First, we compared the MDPB survey results with MA dairy farm data from the USDA National Agriculture Statistics Service (2007) to determine whether both surveys had similar distributions of milking herd sizes and gross sales of milk and other dairy products. The USDA National Agriculture Statistics Service is widely recognized as one of the best sources of agriculture statistics in the U.S. We also compared the MDPB survey results with the MDPB mailing list (unpubl. data, MDPB) to determine whether both data sets indicated a similar regional distribution of MA dairy farms.

Milking Herd Size: Milking herd size distribution was the same for the MDPB survey farms and MA dairy farms reported by the USDA National Agriculture Statistics Service farms (2007; Fig.1, Kolmogorov-Smirnov test, $d_{max} = 7$, $P = 0.10$). The reported MDPB survey farm mean milking herd size was 96 cows which is statistically indistinguishable from the MA mean milking herd size estimate by the USDA National Agriculture Statistics Service (2007). Hence, the MDPB survey dairy farms were likely to be representative of all MA dairy farms based on milk herd size.

Gross Sales of Milk: The mean gross sales of milk and other dairy products were statistically similar for MDPB survey farms and farms in the USDA National Agriculture Statistics Service survey (2007): \$292,000 vs. \$327,622 (Fig. 2; t -test $t = 1.20$, $d.f. = 42$, $P > 0.20$). Hence, the MDPB survey dairy farms were likely to be representative of all MA dairy farms based on gross sales of milk.

Regional Distribution: The regional distribution of MDPB survey farms was very similar to the MDPB mailing list farms, with the western region having the most farms (Fig. 3, Kolmogorov-Smirnov test, $d_{max} = 7$, $P > 0.10$). Hence, the MDPB survey dairy farms were likely to be representative of all MA dairy farms based on regional distribution.

Key Points: The MDPB survey farms were representative of all MA dairy farms based on milking herd size, gross sales of milk, and regional distribution.

Fig. 1. Milking herd size distribution of MDPB survey farms and all MA dairy farms (USDA National Agriculture Statistics Service 2007).

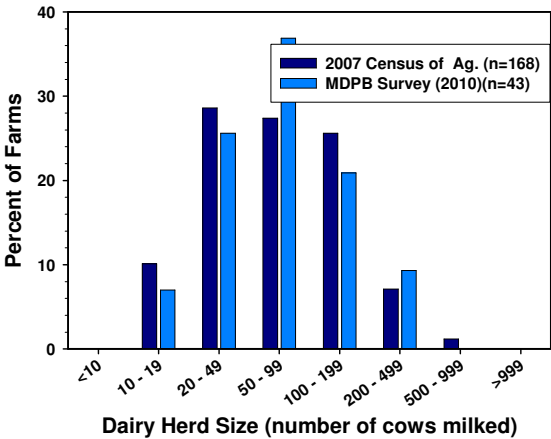


Fig. 2. Gross sales of milk and other dairy products of MDPB survey farms and mean gross sales for all MA dairy farms (horizontal line; USDA National Agriculture Statistics Service 2007). The X is the mean gross sales for MDPB survey farms (\$292,000). Each filled circle represents a farm from the MDPB survey. The bars represent one standard deviation from the mean for MDPB survey farms.

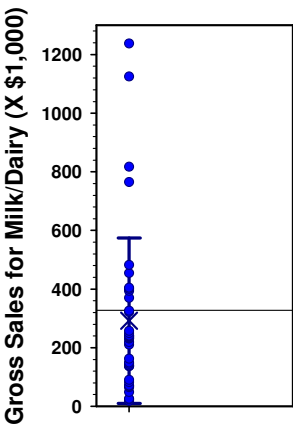
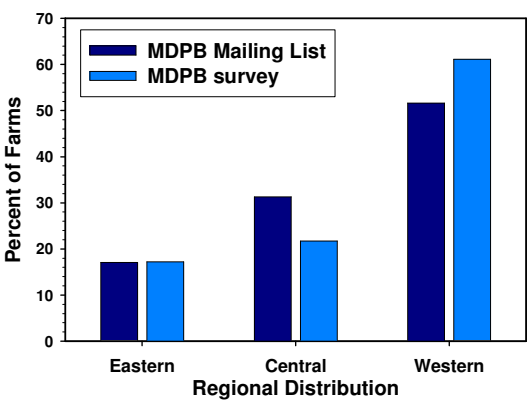


Fig. 3. The regional distribution of MDPB survey farms and all MA farms (from the MDPB mailing list).



Farm Size

Land Managed by Dairy Farmers

Survey Questions:

#2: How many acres of land did you own in 2010?

#3: How many acres of land did you lease or rent or farm that you did not own in 2010?

#57: How many acres of land did you own in 2010 that were forested?

Results: MDPB survey farmers reported that their farms averaged 246 acres in size, included 90 acres of forest, used 173 acres of leased or otherwise non-owned farmland and managed 418 acres (Fig. 4). They reported farm sizes ranging from 0 to 1000 acres. They reported total land managed (owned, leased, and/or otherwise farmed) ranging from 77 acres to 1583 acres.

Most (>50%) of the MDPB survey farmers reported owning >64% of the lands that they managed (Fig. 5). About 11.6% of the MDPB survey farmers reported relying exclusively on leased land or land otherwise not owned.

Key Points: MDPB survey farms were modest in size and were more than one-third forested. Leased land was an important part of the land base supporting their farming activity.

Fig. 4. Farm size (acres) reported by MDPB survey farmers, including acres owned, acres of forest, acres of leased lands (including lands without rental fees), and total acres managed by MDPB survey farmers in 2010. The blue shaded box indicates the 25th percentile (bottom), 50th percentile (solid horizontal line), and 75th percentile (top). The lower and upper whiskered bars indicate the 5th and 95th percentiles, respectively. Filled circles represent outliers. The dotted horizontal lines indicate the mean value.

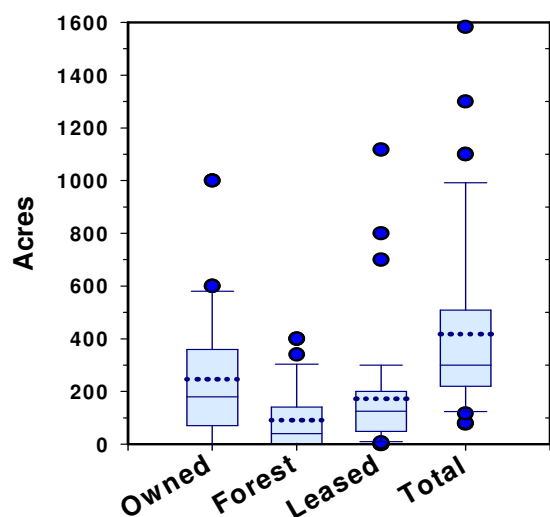
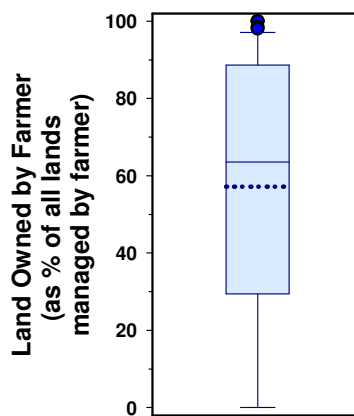


Fig. 5. Percent of land farmed by MDPB survey farmers that was reported owned in fee.



Milking Herd Size:

Survey Question:

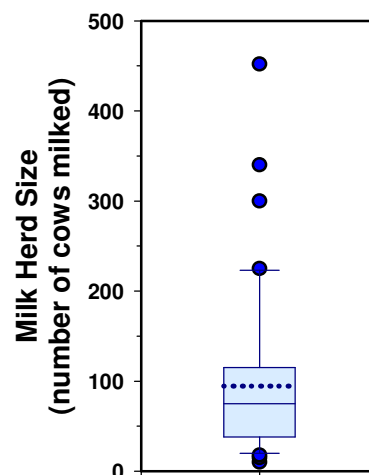
#4: How many cows did you milk in 2010?

Results: MDPB survey farmers reported an average herd size was 96 milking cows, with a range of 10 to 452 cows (Fig. 6). Fifty percent of MDPB survey farmers reported herd sizes ranging from 40 to 120 cows.

The national mean milking herd size, 120 cows/farm, was significantly greater than the MA mean milking herd size of 96 cows/farm (USDA National Agriculture Statistics Service 2007; Kolmogorov-Smirnov test, $d_{\max} > 18$, $P < 0.001$).

Key Points: The average herd size of MDPB survey farms was about 25% smaller than the national average herd size.

Fig. 6. The milking herd size of MDPB survey farms (number of cows) reported for 2010.



Economic Conditions on Dairy Farms: Cost of production

Survey Question:

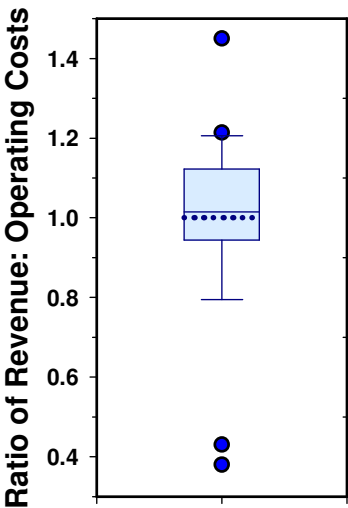
#5: What was the ratio of your farm revenue to farm operating costs in 2010?

Results: The ratio of revenue to operating costs can be used to assess business’s ability to meet short-term cash needs by covering operating costs. A ratio of 1.0 indicates that a business can cover operating costs. A ratio <1.0 indicates that a business is using on-hand capital or borrowing money to pay for short-term operating costs. A ratio >1.0 indicates that a business is able to cover short-term operating costs but may still need additional money to pay for long-term costs.

In 2010, MDPB survey farmers reported an average ratio of 1.00 and the ratio ranged from 0.38 to 1.45 (Fig. 7). In 2010, 38% of MDPB survey farmers reported ratios indicating that their operating costs exceeded revenue. On the other hand, 62% of MDPB survey farmers reported a ratio ≥ 1.0 in 2010.

Key Points: Almost 40% of MDPB survey farmers did not cover costs of milk production in 2010, which was a year of historical low wholesale milk prices.

Fig. 7. The average ratio of revenue to operating costs reported by MDPB survey farmers (n=29) in 2010.



Economic Impacts

Payments to Local Government

Survey Questions:

#8: How much did your farm business pay in local property taxes and excise taxes in 2010?

#9: How much did your farm business pay in municipal utility bills (water, sewer, and/or trash pick-up) in 2010?

Results: Over half (51%) of MDPB survey farmers reported making local payments for trash pick-up, nearly one-third (30%) reported making payments for local drinking water, and only about 5% reported making payments for sewer (Fig. 8).

MDPB survey farmers reported paying on average \$10,350 for local taxes (property plus excise taxes) in 2010 (Fig. 9). Their average reported taxes were more than the \$4,808 average property taxes of MA farm owners and more than the \$3,118 average property taxes of U.S. farm owners (USDA National Agriculture Statistics Service 2007). MDPB survey farmers who farmed only leased land also reported paying local taxes, though five of the farmers with the lowest local taxes in 2010 (<\$800) farmed only leased land. Over 50% of the MDPB survey farmers reported paying >\$7,400 in local taxes. They reported paying local taxes that ranged from \$64 to \$68,150 in 2010. Their tax contributions may have helped financially support town services in over 25% of MA municipalities.

MDPB survey farmers who were supplied water from municipal water districts (n = 13; 30%) reported paying an average of \$552 for water, with their payments ranging from \$270 to \$6,000 in 2010 (Fig. 9). MDPB survey farmers who used municipal trash pick-up (n = 22; 51%) reported paying an average of about \$1,400 for pick-up, with their payments ranging from \$50 to \$3,260 in 2010. MDPB survey farmers who used municipal sewer services (n = 3; 5%) reported paying an average of about \$552 for their local sewer bill, with their payments ranging from \$255 to \$1,130 in 2010.

Key Points: MDPB survey farmers reported paying more in property taxes than other MA farmers and U.S. farmers and making payments that support municipal water utilities, trash pick up, and sewerage.

Fig. 8. Percent of MDPB survey farmers who reported making local payments for trash, water, and sewer.

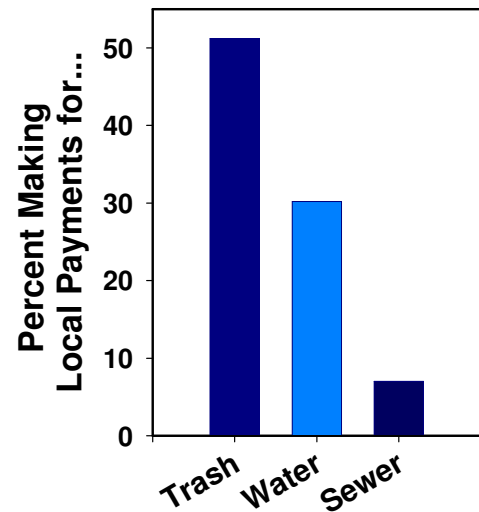
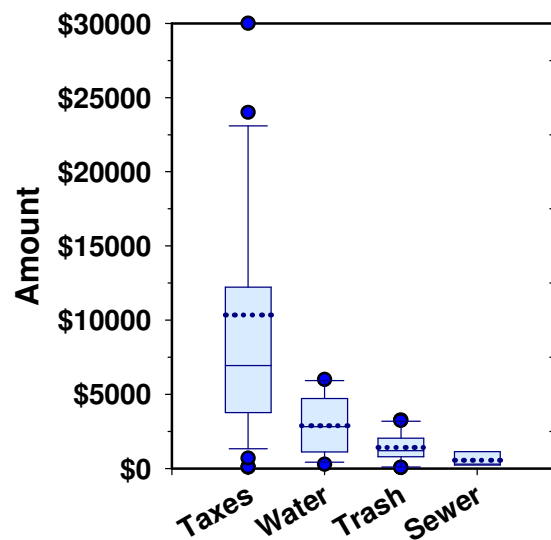


Fig. 9. The average local payments for sewer, trash pick-up, drinking water, and local taxes (property plus excise taxes) reported by MDPB survey farmers for 2010.



Total Gross Agricultural Sales

Survey Question:

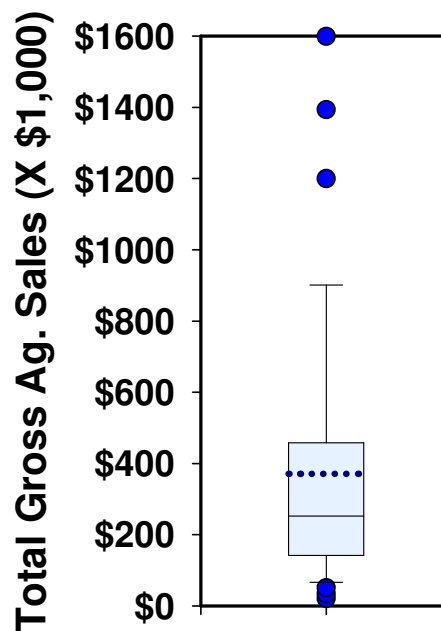
#10: What were your farm business gross sales from milk in 2010?

#11: What were your farm business gross sales from other agricultural products in 2010?

Results: MDPB survey farmers reported average total gross sales (milk gross sales plus gross sales from other agricultural products) of over \$370,000, with values ranging from \$21,000 to \$1,598,700 in 2010 (Fig. 10). Over 50% of MDPB survey farmers reported total gross sales over \$252,600 in 2010.

Key Points: The average reported gross sales of MDPB survey farms from other agricultural products was <50% of the average gross sales for all U.S. dairy farms, \$786,000 (USDA National Agriculture Statistics Service 2007).

Fig. 10. The total gross sales reported by MDPB survey farmers.



Off-farm Employment

Survey Question:

#13: How important is income from off-farm employment to the economic viability of your farm?

#14: What percentage of your family net income is from off-farm employment?

Results: Almost two-thirds (58%) of MDPB survey farmers reported that off-farm employment was important to the economic viability of their farm (Fig. 11). About one-third (32.6%) of MDPB survey farmers reported that off-farm employment was unimportant to the economic viability of their farm because off-farm employment was not used to support the farm family.

Thirty-five MDPB survey farmers reported the percentage of their family net income from off-farm employment. Of these 35 farmers, 35.8% reported that off-farm employment accounted for none of their family net income (Fig. 12). An average of 37% of family net income was from off-farm employment (n=35). Off-farm employment was reported as accounting for more than 20% of net MDPB survey farmer family income.

Key Points: Off-farm employment was economically important to MDPB survey farmers. While 64.2% of MDPB survey farm families had off-farm income, over 93% of U.S. farm families had off-farm income (Dimitri et al. 2005). Farm families in animal agriculture are less likely to seek off-farm employment because it is difficult to replace them selves with employees with their unique skill set (Leistritz et al. 1985). Off-farm employment reportedly accounted for >20% of net family income for >50% of MDPB survey farmers.

Fig. 11. The percent of MDPB survey farmers who reported the different levels of importance of income from off-farm employment to the economic viability of farms (percent of MDPB survey farmers).

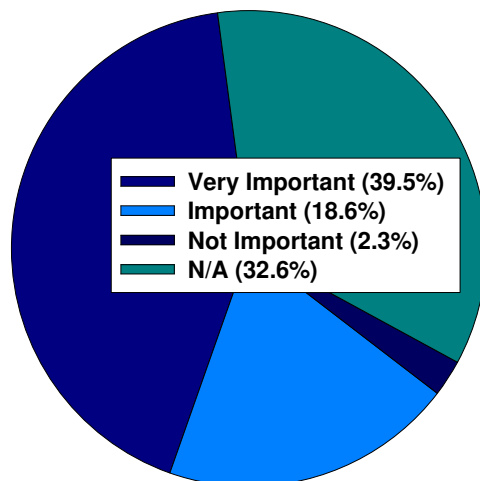
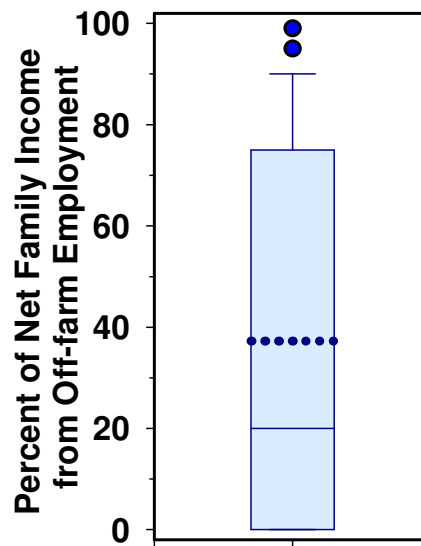


Fig. 12. Percent of net family income reported by MDPB survey farmers derived from off-farm employment in 2010.



Employees

Survey Questions:

#15: How many full-time equivalent (FTE = 40 hrs/week) employees did your farm business have in 2010?

#18: What was your farm business total payroll (including workers' compensation and unemployment insurance) in 2010?

#19: What was the financial value of fringe benefits (e.g., health insurance, food, housing, transportation, vehicle use) provided to employees in 2010?

Results: MDPB survey farmers reported an average of just over 2 FTE employees per farm and ranged from 0 to 9 FTE employees (Fig. 13). Fifty percent of the MDPB survey farmers reported <2 employees per farm.

MDPB survey farmers reported a farm business total payroll (including workers' compensation and unemployment insurance) that averaged \$67,300 and ranged from \$0 to \$492,000 in 2010 (Fig. 14). They reported that the financial value of fringe benefits (e.g., health insurance, food, housing, transportation, vehicle use) provided to employees averaged \$13,200 and ranged from \$0 to \$95,000 in 2010 (Fig. 14).

Key Points: Based on these statistics, MA dairy farmers directly employed an estimated 588 people with an average wage that was greater than the living wage for MA. Their total payroll was an estimated \$13.5 million in 2010.

Fig. 13. Number of FTE employees reported per MDPB survey farm in 2010.

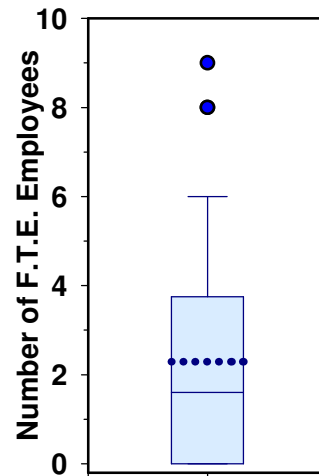
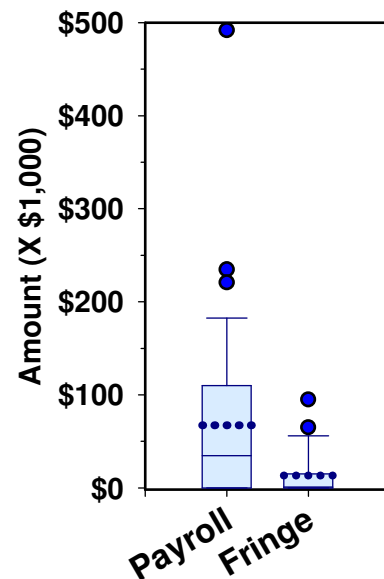


Fig. 14. Farm business total payroll (including workers' compensation and unemployment insurance) reported per MDPB survey farm.



Local Purchases

Survey Questions:

#16: Which of the following supplies or services were mostly ($\geq 50\%$) purchased from suppliers or service providers inside Massachusetts in 2010?

#17: What percentage of your expenditures for supplies and services were spent on suppliers and/or service providers outside of Massachusetts in 2010?

Results: Overall, MDPB survey farmers reported spending the largest part of their expenditures in MA. About 50% or more of MDPB survey farmers reported buying more than 50% of their supplies and services in MA, with the exception of heifers (Fig. 15). MDPB survey farmers reported spending an average of about 59% of their expenditures for supplies and services on providers inside of MA in 2010 (Fig. 16).

Key Points: MDPB survey farmers reported purchasing supplies and services mostly from local suppliers. They reported spending nearly two-thirds of their expenditures (59%) within MA. Anecdotally, they reported that they purchased supplies and services outside MA when the nearest vendors were in adjacent states or to keep operating costs down.

Fig. 15. Percent of MDPB survey farmers reporting the purchase of twelve different supplies or services mostly ($>50\%$) from suppliers or service providers inside Massachusetts in 2010.

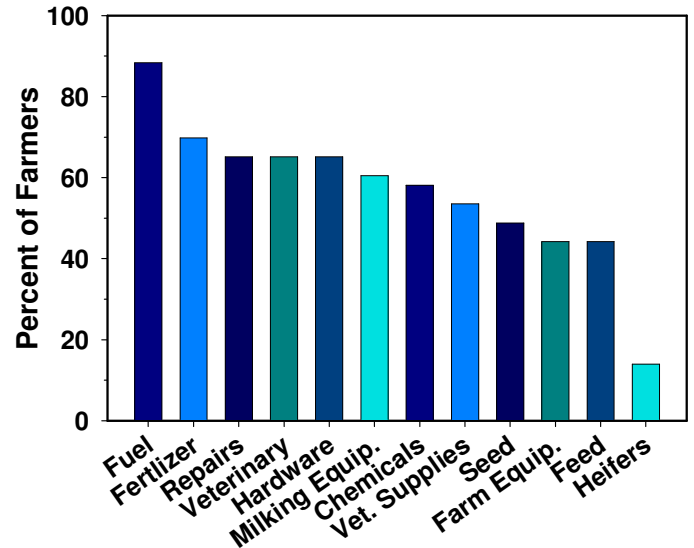
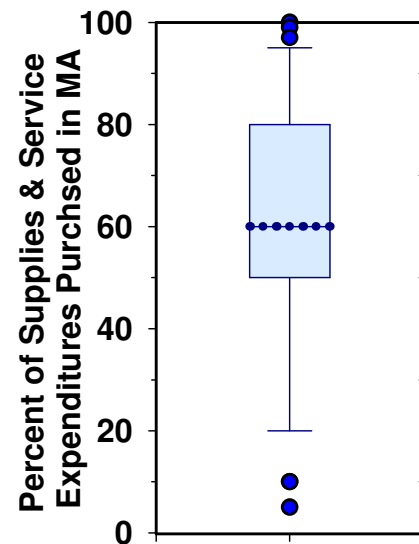


Fig. 16. Percent of supplies and service expenditures purchased in MA as reported by MDPB survey farmers.



Benefits to Local Communities

Local Production of Food and Other Agriculture Products

Survey Questions:

#20: What was your annual milk production in 2010?

#21: What other agricultural products from the farm were sold in 2010?

#22: Which of your agricultural products were direct marketed to consumers in 2010?

#23: What percentage of your gross sales were direct marketing expenses for dairy products in 2010?

Results: MDPB survey farmers reported milk production that averaged 1,133,000 cwt per farm and ranged from 2,000 cwt to 6,900,000 cwt in 2010 (Fig. 17). Half of the MDPB survey farmers reported producing >750,000 cwt.

Over 40% of MDPB survey farmers reported selling heifers and calves, hay, and manure in 2010 (Fig. 18). About 80% of MDPB survey farmers reported selling products other than milk, including meat, maple syrup, eggs, vegetables, etc. Of the 34 MDPB survey farmers that reported selling products, 91% reported selling more than one product.

About 70% of MDPB survey farmers reported that they direct marketed products. This exceeded the 22% of MA farms that reported direct marketing in 2007 (USDA Census of Agriculture 2007). About 27% of MDPB survey farmers reported directly marketing food products to consumers, with 30% reporting the direct marketing of manure and hay (Fig. 19). They also reported direct marketing meat, dairy products, eggs, firewood, maple syrup, vegetables, baked goods, honey, apples, berries, and flowers. Of the 30 MDPB survey farmers that direct marketed products, 83% reported direct marketing more than one product.

Twenty-five of 43 (58%) MDPB survey farmers reported direct marketing expenses as a percentage of gross sales. Of the 25 MDPB survey farmers, 56% reported direct marketing expenses >0% and these spent an average of 28% of their gross sales on direct marketing expenses.

Key Points: About 80% of MDPB survey farmers reported selling products other than milk and about 70% direct marketed agriculture products. About 27% also reported directly selling food products to consumers, which was greater than the MA farm average of 8.6% and the national farm average of 6.1% (t-test, $t=1.96$, $d.f.=42$, $P<0.05$; Maryland Department of Planning 2007).

Fig. 17. The average annual milk production (cwt, hundred weight) reported per MDPB survey farmer for their dairy farms in 2010.

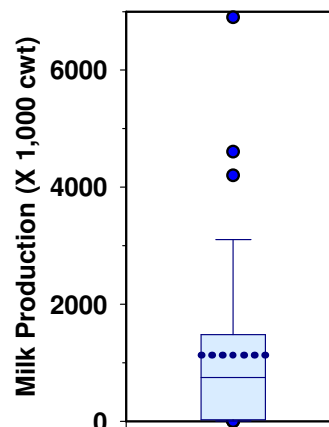


Fig. 18. Percent of MDPB survey farmers who reported the sale of fifteen agricultural products from their farms in 2010.

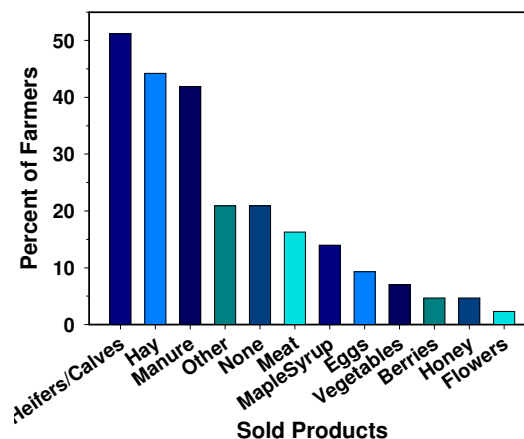
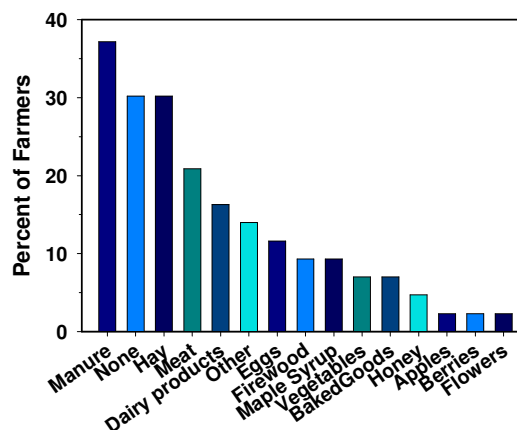


Fig. 19. Percent of MDPB survey farmer who reported direct marketing of 15 agricultural products to consumers in 2010.



Volunteering in Local Community

Survey Questions:

#24: Which of the following types of organizations did you volunteer for in 2010?

#25: Please estimate the number of hours you volunteered in 2010 for charitable organizations.

#26: Please estimate the number of hours you volunteered in 2010 in local government.

Results: About 80% of MDPB survey farmers reported volunteering their time for ≥ 1 organization and 60% of farmers volunteered their time for ≥ 2 organizations (Fig. 20). Almost 50% of MDPB survey farmers reported volunteering with local agriculture organizations. Over one-third of MDPB survey farmers volunteered in local government (e.g., members of selectman boards, town councils, planning boards). They also reported volunteering in local churches, youth organizations (e.g., 4-H, scouting), land trusts, other civic clubs, and public safety.

MDPB survey farmers reported volunteering an average of 90 hours/year (Fig. 21). They reported volunteering an average of 55 hours a year to charitable organizations. They also reported volunteering an average of 43 hours/year to local government activities, with half of the MDPB survey farmers volunteering to fill positions in local government.

Key Points: About 80% of MDPB survey farmers volunteered their time, which was far greater than the volunteer rate of 26.3 % for MA residents in 2009, a rate which had been stable for the previous decade (CNCS 2010a). MDPB survey farmers volunteered an average of 90 hours/year, which was twice as many hours as the average volunteer hours of 27 hours/year for MA residents in 2009 (CNCS 2010a). Because volunteer time in MA was valued at \$26.18/hour (CNCS 2010b), the average MDPB survey farmer donates about \$2400 in time/year.

Fig. 20. Percent of MDPB survey farmers who reported volunteering their time for different types of organizations in 2010.

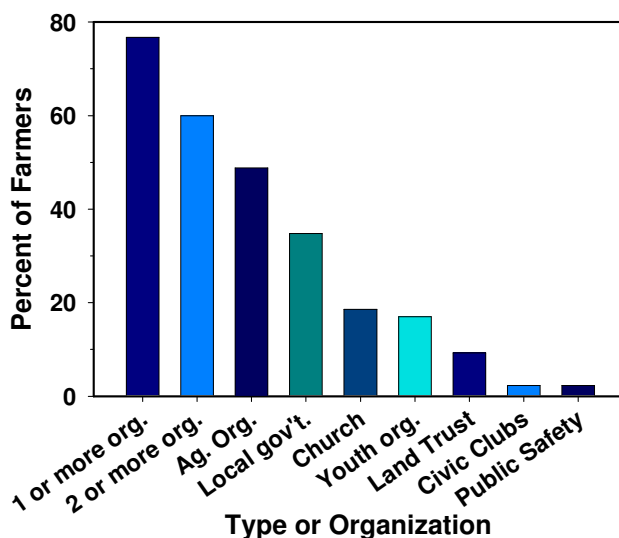
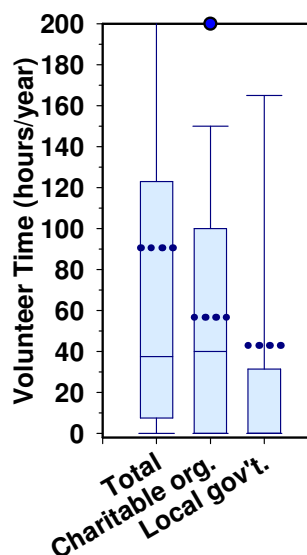


Fig. 21. Total volunteer time, charitable organization volunteer time, and local government volunteer time (hours/year) reported by MDPB survey farmers for 2010.



Charitable Giving

Survey Questions:

#27: Did you make charitable contributions of services and/or materials, including agricultural products in 2010?

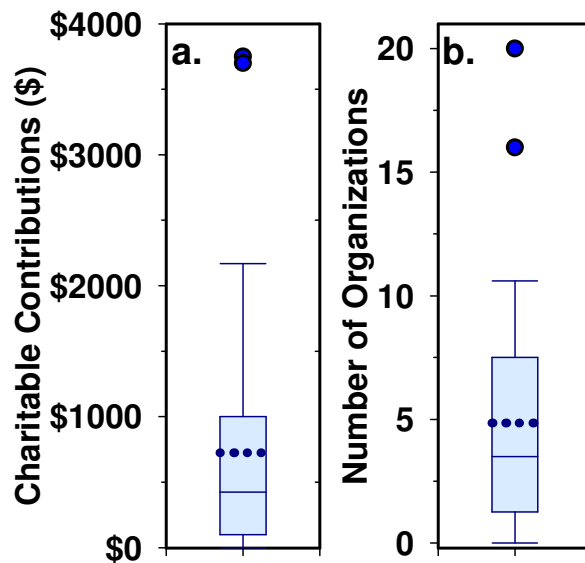
#28: What was the value of your charitable contributions in 2010?

#29: How many charitable and/or non-profit organizations did you financially donate to in 2010?

Results: About half of the MDPB survey farmers reported charitable contributions of services and/or materials (53%) and money (51%) in 2010. Annual financial charitable contributions reported by MDPB survey farmers averaged \$725 in 2010 (Fig. 22a). The MDPB survey farmers reported making contributions to an average of five organizations (Fig. 22b).

Key Points: About 50% of MDPB survey farmers reported making charitable contributions. Their average reported annual financial charitable contribution was \$725 in 2010, which was about 40% less than average charitable contributions made by U.S. residents. (\$1,214; Bryan 2010).

Fig. 22a+b. The economic value of farmer charitable contributions and number of charitable organizations receiving contributions as reported by MDPB survey farmers for 2010.



Agriculture Outreach

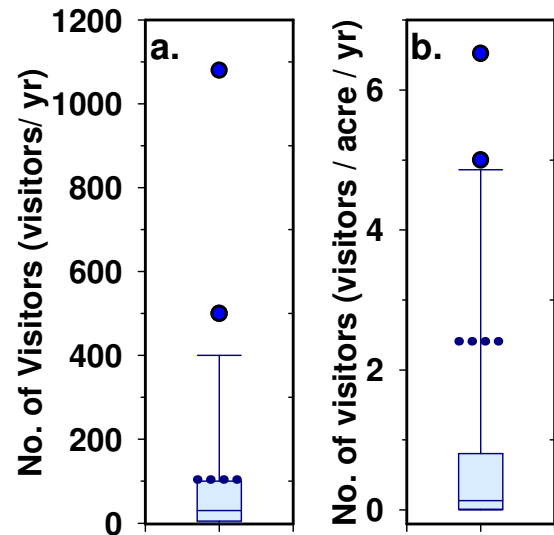
Survey Questions:

#30: How many visitors toured and learned about dairy agriculture on your farm in 2010?

Results: MDPB survey farmers reported an average of 100 visitors/year or 2.4 visitors/acre/year who toured and learned about agriculture (Fig. 23a+b).

Key Point: MDPB survey farms had visitation rates for tours that are about 25% of the visitation rates for some national parks in the lower 48 states (Walls 2009).

Fig. 23a+b. (a) Number of annual visitors / year who toured farms and (b) number of visitors / acre/year in 2010 based on reports by MDPB survey farmers.



Being a Good Neighbor

Survey Questions:

#31: Do you employ practices to reduce the odors associated with manure spreading?

#32: Do you employ practices to minimize the effect of fly populations on your neighbors?

#33: What other practices and strategies do you employ to be a good neighbor?

#34: How would you describe the level of community support for dairy farming in your community or town?

Results: Almost all MDPB survey farmers (98%) reported employing at least one practice to be a good neighbor (Fig. 24). More than three-fourths of MDPB survey farmers reported employing practices to reduce odor associated with manure spreading (77%) and to minimize the effect of fly populations on their neighbors (81%). Two-thirds (65%) of MDPB survey farmers reported either providing their contact information or routinely talking to neighbors. Other good neighbor strategies reported by MDPB survey farmers included giving manure to neighbors and placing new buildings away from property lines.

Almost three-quarters of MDPB survey farmers reported that local communities were supportive or very supportive of local dairy farming (Fig. 25).

Key Points: Almost all MDPB survey farmers (98%) employed at least one practice to be a good neighbor. Almost three-quarters of MDPB survey farmers indicated that local communities were supportive or very supportive of local dairy farming.

Fig. 24. Percent of MDPB survey farmers who reported the use of seven different practices to be good neighbors.

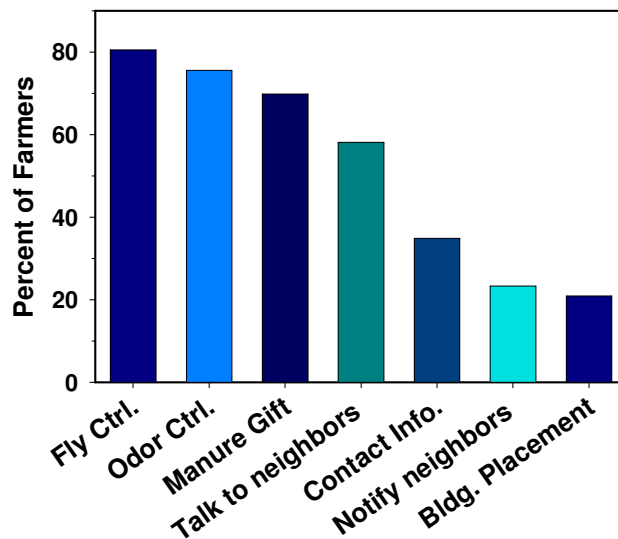
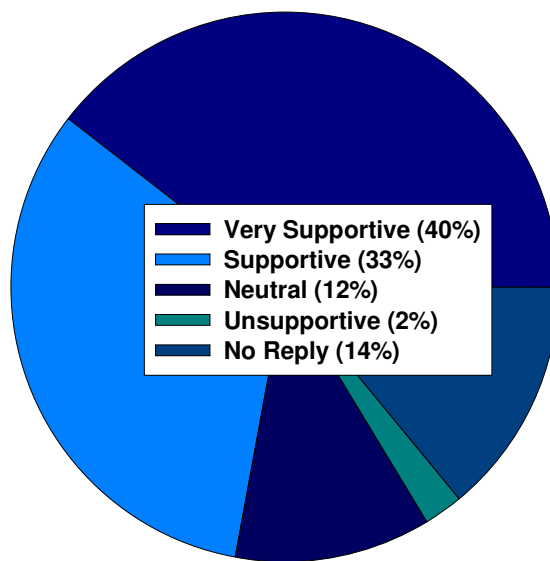


Fig. 25. The level of community support for dairy farming in local communities as reported by MDPB survey farmers.



Recreation Access and Use

Survey Questions:

#35: How many acres of land (including land that you do not own but control access) did you make available for recreational access in 2010?

#36: Approximately how many recreational users accessed this land in 2010?

#37: Do you have any established public facilities (trails, boat ramps, etc.) on your property used for recreational purposes?

#38: What level of public access to your property do you provide for recreational activities?

#39: If access is permitted, which of the following activities take place on your property?

Results: MDPB survey farmers reported making available an average of 218 acres per farm to recreational users in 2010 with >50% of MDPB survey farmers reporting making available >100 acres (Fig. 26a). They reported an average of 184 recreational visitors in 2010 (Fig. 26b), which translated into an average of 5.3 recreational visitors/acre/year although 50% of the MDPB survey farmers reported <0.25 recreational visitors/acre/year (Fig. 26c). Almost 40% of MDPB survey farmers (39%) reported that they had established public facilities (trails, boat ramps, etc.) on their property for recreational purposes.

About 87% of MDPB survey farmers reported providing public access for recreation (Fig. 27). Nearly a third (28%) reported providing open access to anyone. About 40% of MDPB survey farmers reported requiring that visitors seek permission to gain access. Only 12% of MDPB survey farmers reported providing no access.

MDPB survey farmers who reported providing access listed 15 recreational activities taking place on their land (Fig. 28). Over 75% of MDPB survey farmers provided hunting access. Over one-third of MDPB survey farmers reported providing access for one or more of six other activities.

Key Points: MDPB survey farms provided recreational access to an estimated 37,000 acres statewide. About 75% of MDPB survey farmers reported providing public access. In contrast, only 12.6% of forest landowners in the U.S. provided public access (Butler 2008). Twenty-eight percent of MDPB survey farmers provided open access, which was much greater than 11% reported for all landowners in the northern U.S. (Cordell et al. 1993). MDPB survey farmers averaged 5.3 recreational visitors/acre/year. or about half the 9.8 visitors/acre/year for national parks (Walls 2009).

Fig. 26 a, b, and c. Levels of recreational use reported by MDPB survey farmers: (a) number of acres per farm made available for recreation; (b) number of visitors reported per farm per year; (c) number of visitors reported / acre / year.

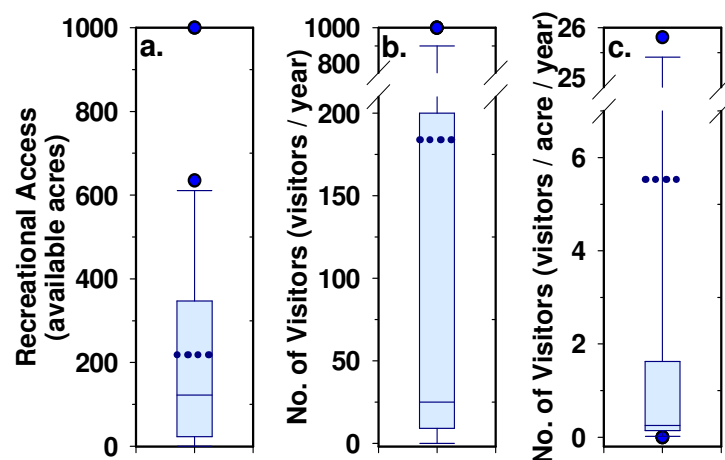


Fig. 27. Type of recreational access reported by MDPB survey farmers for 2010.

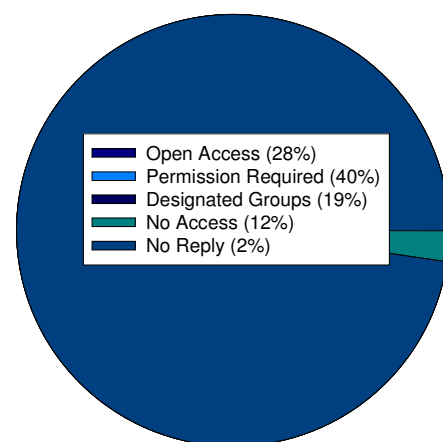
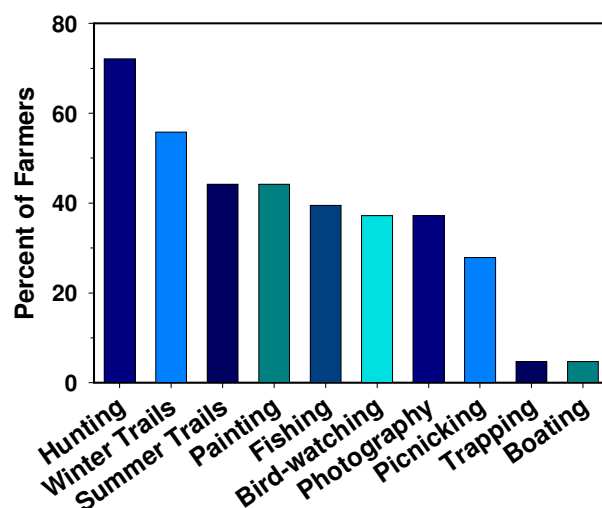


Fig. 28. Percentage of MDPB survey farms reporting ten different recreational activities occurring on their farm.



Multi-generational Farms and Farm Transfer

Survey Questions:

#40: How many generations has your dairy been in your family?

#41: How many generations live and/or work on your dairy?

#42: Are you planning to transfer your farm business to the next generation?

#43: If yes to #42, do you have an agreement or plan to transfer your farm business to the next generation?

Results: MDPB survey farmers reported that their farms had been in the family for an average of four generations, with a range of 1 to 13 generations (Fig 29a). Twenty-five percent of MDPB survey farmers reported that their farms had been in their family for ≥ 5 generations.

MDPB survey farmers reported that their farms averaged two generations living and/or working on the farm, with a range of 1 to 5 generations on the farm (Fig. 29b). Twenty-five percent of MDPB survey farmers reported three or more generations living and/or working on the farm.

Almost two-thirds of MDPB survey farmers (60%) planned to transfer their farm to the next generation (Fig. 30). Nearly 12% were not planning to transfer their farm to the next generation. Nearly one-quarter of MDPB survey farmers (23%) were undecided (5% did not reply).

Of the two-thirds of MDPB survey farmers (60%, n=31) who planned to transfer their farm to the next generation, slightly less than one half reported having a plan for making the transfer (Fig. 31). About one-third of the MDPB survey farmers reported having an informal verbal agreement or written plan for transferring their farm to the next generation. Only about 13% of the MDPB survey farmers reported having a written plan transferring their farm to the next generation.

Key Points: MDPB survey farms were multi-generational, typically staying within a family for ≥ 3 generations and sometimes as long as 13 generations. Most MDPB survey farms have at least two generations living and/or working on the farm. Although about two-thirds of MDPB survey farmers reported planning to transfer their farm to the next generation, only about half of these farmers reported having a transfer plan. Only about 13% of the MDPB survey farmers reported having a written plan to transfer their farm to the next generation, which was much lower than the 2003 national average, 27% (Mishra et al. 2005).

Fig. 29a+b. (a) Number of generations farm has been in family and (b) number of generations living on farm reported by MDPB survey farmers.

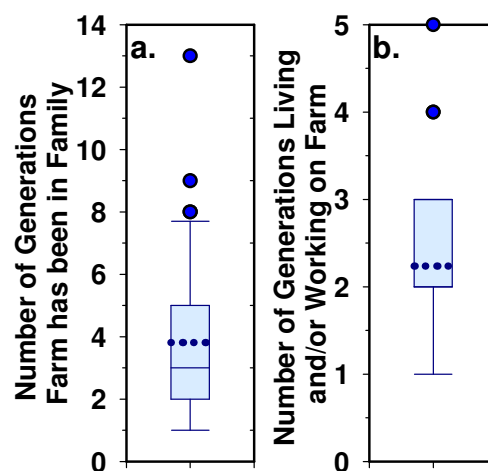


Fig. 30. Percent of MDPB survey farmers reported planning to transfer their farm to the next generation.

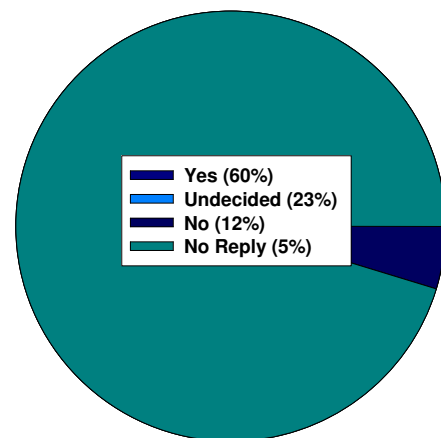
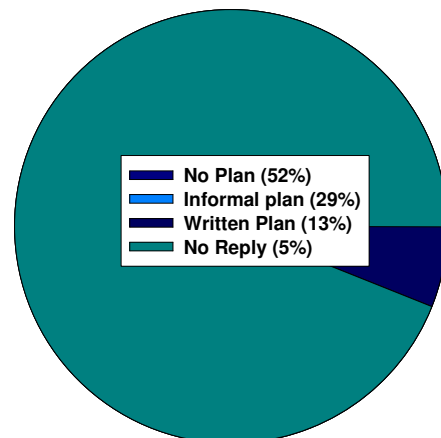


Fig. 31. Percent of MDPB survey farmers who reported having no plan, an informal plan, or a written plan for transferring their farm to the next generation or who did not report the status of transfer planning.



Agricultural Heritage and Conservation

Survey Questions:

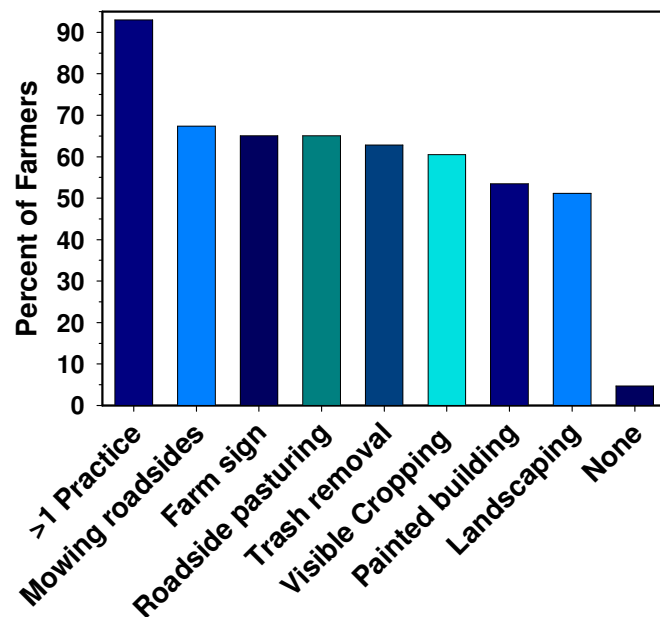
#47: Did you maintain farm buildings or structures >60 years old that are visual reminders to your community of its agricultural heritage?

#48: Did you add to the scenic appeal of your farm by employing any of the following practices in 2010?

Results: About 67% of MDPB survey farmers reported that they maintained farm buildings or structures >60 years old that were visual reminders to their communities of their agricultural heritage (Fig. 32). Over 90% of MDPB survey farmers reported using >1 practice that added to the scenic appeal of their farm in 2010 (Fig. 32). These practices included: mowing along roadsides, placing conspicuous farm signs, pasturing cows along roadsides, removing trash along road, cropping in areas visible from the road, painting or re-siding visible buildings in the last 10 years, and landscaping the entrance to their farm. At least 50% of MDPB survey farmers applied all of these practices.

Key Points: About 67% of MDPB survey farmers maintained farm buildings >60 years old which were visual reminders of local agricultural heritage, more than double the national average of 30.1% for all U.S. farms with buildings >50 years old (Maryland Department of Planning 2007, National Park Service 2011). Over 90% of MDPB survey farmers used more than one practice to enhance the scenic appeal of their farm in 2010.

Fig. 32. Percent of MDPB survey farmers reporting the use of different practices that add to the scenic appeal of their farm.



Environmental Conservation

Stewardship and Best Management Practices (BMPs)

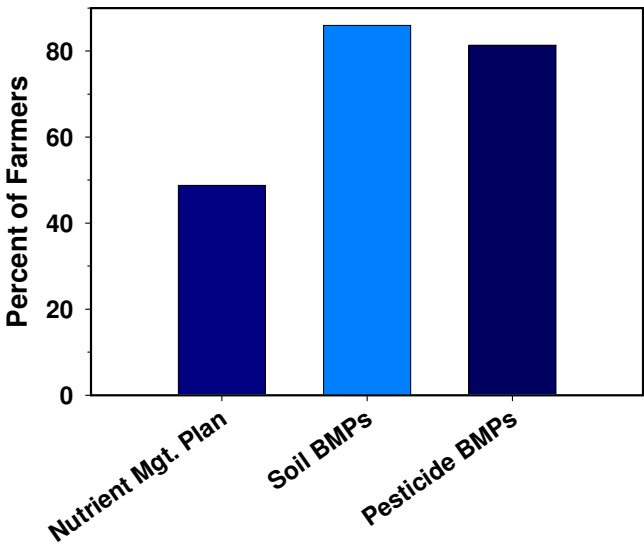
Survey Questions:

- #49: Did you have a state- or NRCS-approved nutrient management plan in 2010?
- #52: Do you apply soil best management practices when needed to minimize erosion?
- #53: Do you apply best management practices for all pesticide, herbicide and/or fungicide applications?

Results: About 50% of MDPB survey farmers reported having a state- or NRCS-approved nutrient management plan in 2010 (Fig. 33). About 80% of MDPB survey farmers reported applying soil erosion BMPs and BMPs for the application of pesticides, herbicides, and fungicides.

Key Points: About 50% of the MDPB survey farmers had a state- or NRCS-approved nutrient management plan in 2010, a level much greater than the 8.8% of U.S. corn farmers who use nutrient management plans (Lambert et al. 2007). Nearly all MDPB survey farmers apply BMPs to conserve soils and use agriculture chemicals appropriately.

Fig. 33. Percentage of MDPB survey farmers who reported having a state- or NRCS-approved nutrient management plan, applying soil BMPs, and applying BMPs for pesticide, herbicide and/or fungicide applications in 2010.



Soil Testing

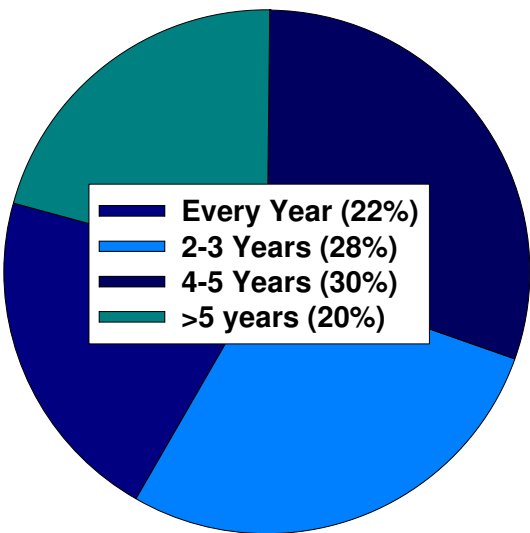
Survey Question:

#51: How often do you test the soil in your fields?

Results: About 50% of MDPB survey farmers reported testing their soil every three years or less (Fig. 33). About 20% of MDPB survey farmers reported testing their soil every six or more years.

Key Points: Eighty percent of MDPB survey farmers reported testing soils frequently enough (at least every 5 years; Bruulsema and Ketterings 2008) to help ensure best management of nutrients and manure.

Fig. 39. Frequency of soil testing reported by MDPB survey farmers.



Other Farming Practices

Survey Questions:

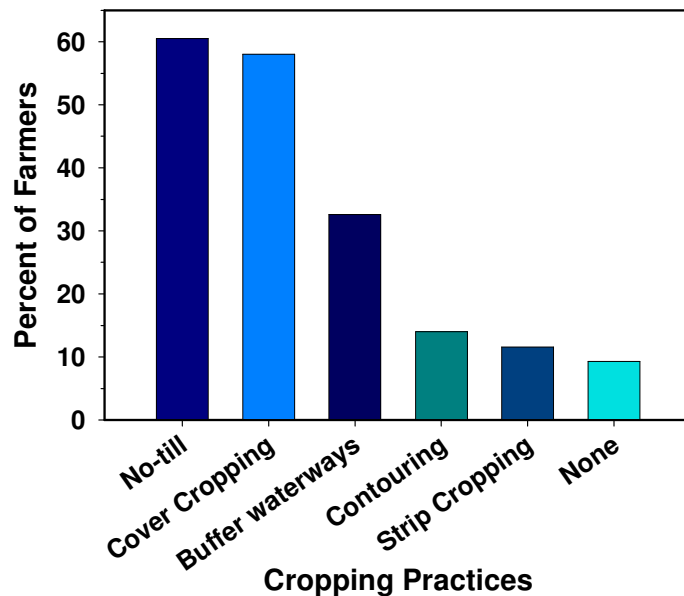
#50: What percentage of field acres planted to annual crops (corn, cereal grain, soybeans, or other) had cover cropping over the winter 2010-2011?

#54: Which agricultural cropping practices do you uniformly adopt across your farm fields to minimize nutrient run off and address potential water quality issues?

Results: Over 90% of the MDPB survey farmers reported applying farming practices to minimize nutrient run off and address potential water quality issues (Fig. 40). Over 50% of MDPB survey farmers reported applying no-till and cover cropping practices to their annual crop fields (Fig. 40). About 30% of MDPB survey farmers reported using buffers along waterways to protect water quality. Some MDPB survey farmers may have not used buffers along waterways because their farm land did not abut waterways. The percentage of MDPB survey farmers who reported the use of other practices such as contouring and strip cropping was <15%. About 10% of the MDPB survey farmers did not report the application of any of these cropping practices to minimize nutrient run off and address potential water quality. When MDPB survey farmers used cover cropping on annual crop fields, they reported an average of 63.3% of their annual crop acreage utilized cover cropping, with 50% of the farmers applying cover cropping to >50% of their annual crop fields.

Key Point: Almost 60% of MDPB survey farmers reported using no-till practices which was much greater than the 34% of U.S. corn farmers who used conservation tillage including no-till (Lambert et al. 2007). About 30% of MDPB survey farmers reported using buffers along waterways which was at a level much greater than U.S. family farms in 2001 (8%; Lambert et al. 2007). Over 90% of the MDPB survey farmers reported applying practices to minimize nutrient run off and protect water quality.

Fig. 40. Percentage of MDPB survey farmers who reported applying any of five agricultural cropping practices to minimize nutrient run off and address potential water quality issues.



Wildlife Habitat

Survey Questions:

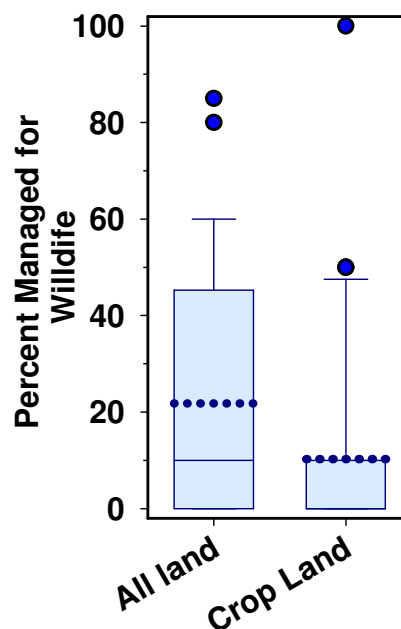
#55: What percentage of your total acreage was made up of land that was managed primarily for wildlife species or was not managed for agriculture and is suitable for wildlife habitat in 2010?

#56: On what percentage of your acres cropped or managed for forage did you apply wildlife conservation practices in 2010?

Results: Forty-six percent of MDPB survey farmers reported managing some portion of their farm for wildlife species or wildlife habitat. On average MDPB survey farmers reported managing >20% of their lands primarily for wildlife and about 10% of their crop lands for wildlife (Fig. 41). About 25% of MDPB survey farmers reported managing almost 50% or more of their lands primarily for wildlife.

Key Points: Forty-six percent of MDPB survey farmers reported managing some portion of their farm for wildlife, which was much greater than a similar statistic of 4% of U.S. family farmers who enhanced their land for wildlife (Lambert et al. 2007). Based on these statistics, this amounts to an estimated total 23,000 acres of wildlife habitat.

Fig. 41. Percentage of all land reported by MDPB survey farmers as being managed for wildlife species and percentage of crop and forage lands reported by MDPB survey farmers where wildlife conservation practices were applied in 2010.



Renewable Energy and Energy Conservation

Survey Questions:

#58: What alternative energy sources did you use in 2010?

#59: What energy conservation measures or upgrades have you applied in the last 5 years?

Results: Over 65% of MDPB survey farmers reported using one or more types of alternative energy on their farm (Fig. 42). About 35% of MDPB survey farmers reported using an outdoor wood boiler while about 25% used other types of wood heat. MDPB survey farmers also reported using solar, wind, and geothermal energy sources on their farms.

Over 95% of MDPB survey farmers applied one or more energy conservation practices to their farms in the last 5 years (Fig. 43). More than 40% of MDPB survey farmers reported installing plate coolers, using reduced tillage, and/or reducing the number of tractor passes in the field to conserve energy. They also reported other energy conservation practices such as energy audits and the installation of pre-heaters, efficient light, variable speed pumps, and efficient barn fans.

Key Points: Over 65% of MDPB survey farms reported using alternative energy sources. MDPB survey farmers' use of renewable energy from wind, solar, and/or methane digesters was more frequent than other farmers in New England and significantly ahead of U.S. farmers (t-test, $t=1.97$, d.f.=42, $P<0.05$), with 11.6% of MDPB survey farmers using these renewable energy sources compared with 10% of New England farmers and <1% of U.S. farmers (2009 Census of Agriculture). Nearly all MDPB survey farms reported applying energy conservation measures in the last 5 years. Over 25% of MDPB survey farms reported having had audits which was significantly greater than <2% of New England farms (t-test, $t=1.97$, d.f. 42, $P<0.05$) and <1% of U.S. farms (t-test, $t=1.97$, d.f. 42, $P<0.01$; 2009 Census of Agriculture). MDPB survey farms reported using renewable energy and energy conservation much more frequently than regional farms and U.S. farms.

Fig. 42. Percentage of MDPB survey farms reported using different sources of alternative energy in 2010.

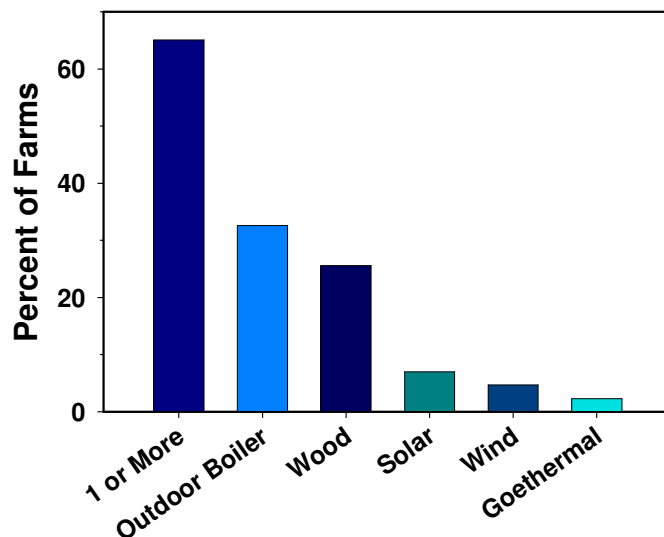
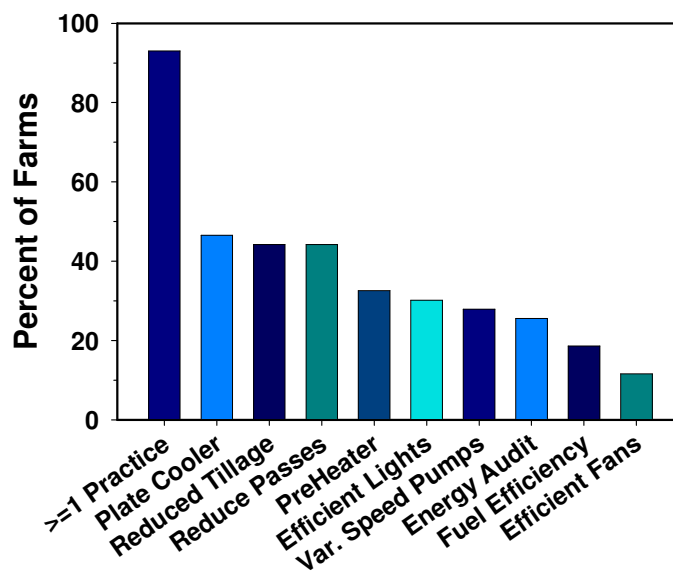


Fig. 43. Percentage of dairy farmers who applied various energy conservation practices in the last 5 years.



Importance of State and Federal Farm Programs

Importance of MA Dairy Farmer Tax Credit Program

Survey Question:

#6: Was the MA Dairy Farmer Tax Credit payment that you received for tax years 2008 and 2009 important to maintaining the economic viability of your farm (payments would have been received in 2009/2010)?

#7: How did you use the MA Dairy Farmer Tax Credit payment that you received for tax years 2008 and 2009 to help maintain the economic viability of your farm business?

Results: Nearly all responding MDPB survey farmers (95%) indicated that their MA Dairy Farmer Tax Credit payment for tax years 2008 and 2009 was important for maintaining the economic viability of their farm (Fig. 44).

Over 95% of MDPB survey farmers reported using their tax credit from 2009 and 2010 to pay for operating costs, 79% using it to pay debts, and 62% using it to pay for capital improvements. The 5% of MDPB survey farmers who did not use the credit to pay for operating costs reported using it to pay debts (Fig. 45).

Key Point: The MA Dairy Farmer Tax Credit Program was very important to maintaining the economic viability of dairy farmers in 2009 and 2010. Nearly all MDPB survey farmers reported using the MA Dairy Farmer Tax Credit Program to cover operating expenses and manage debt following the 2008 and 2009 tax years, a time when wholesale milk prices were at nearly record lows. These business strategies are frequently used by business owners to stabilize and strengthen businesses when prices are down.

Fig. 44. Percent of MDPB survey farmers who indicated that their MA Dairy Farmer Tax Credit payment that was received for tax years 2008 and 2009 was important to maintaining the economic viability of their farm.

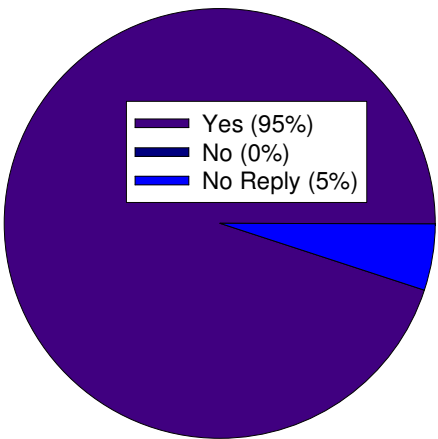
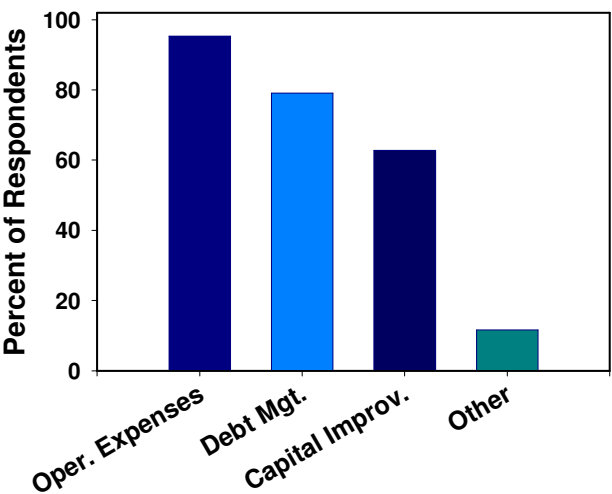


Fig. 45. Percent of MDPB survey farmers who reported using the MA Dairy Farmer Tax Credit payment that they received for tax years 2008 and 2009 for covering operating costs, debt management, capital improvements, and other uses.



Participation in Other State and Federal Farm Programs

Survey Questions:

#44: Please list the conservation programs in which you participated in 2010.

#45: Of land you own, how many acres were permanently protected through an agricultural preservation restriction or conservation restriction at the end of 2010?

#46: Of land that you leased or rented or used in 2010 but did not own, how many acres were permanently protected through a MA Agriculture Preservation Restriction or conservation restriction/easement when you used them?

Results: Many MDPB survey farmers reported the use of twelve types of state and federal conservation programs for conserving their farmland. Over two-thirds of MDPB survey farmers reported using the Mass. Taxation Law Chapter 61, 61a, 61b, or 61c Program, which values farmland at current use for property taxes (Fig. 46). About one-third of MDPB survey farmers reported using the Natural Resources Conservation Service's (NRCS) Environmental Quality Incentive Program (EQIP). About 25% of MDPB survey farmers reported using the MA Agriculture Preservation Restriction Program and the MA Agriculture Environmental Enhancement Program. About 20% of MDPB survey farmers reported renting state lands for farming and/or using conservation restrictions and easements. Only 10% of MDPB survey farmers reported not using any conservation programs. Less than 7% of MDPB survey farmers reported using each of the following NRCS programs: Grassland Reserve Program, Agriculture Management Assistance, Farm and Ranchland Protection Program, Wetlands Reserve Program, Wildlife Habitat Incentive Program, and Conservation Security Program.

MDPB survey farmers reported on average that 31% of their lands and 25% of leased or rented lands were in conservation restriction programs (Fig. 47).

Key Point: MDPB survey farmers use twelve types of conservation programs to reduce their property tax burden and increase their use of conservation practices. About 1/3 of MDPB survey farmers use EQIP compared with <1% of U.S. farmers (United States Department of Agriculture 2003), though about 16% of U.S. farms were enrolled in various USDA NRCS programs (US Census of Agriculture 2007).

Fig. 46. Percent of MDPB survey farmers reporting participation in six major conservation programs in 2010.

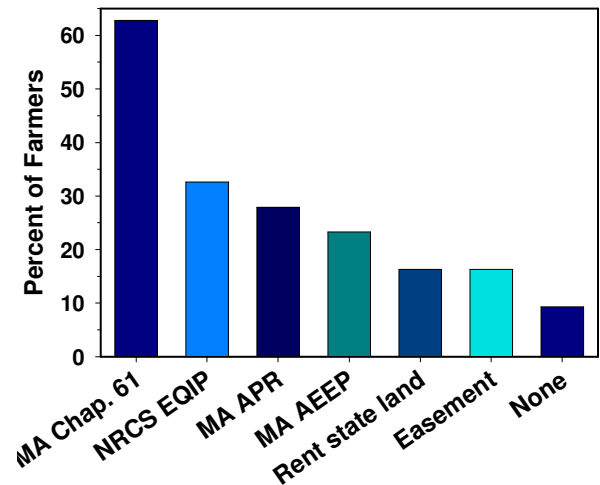
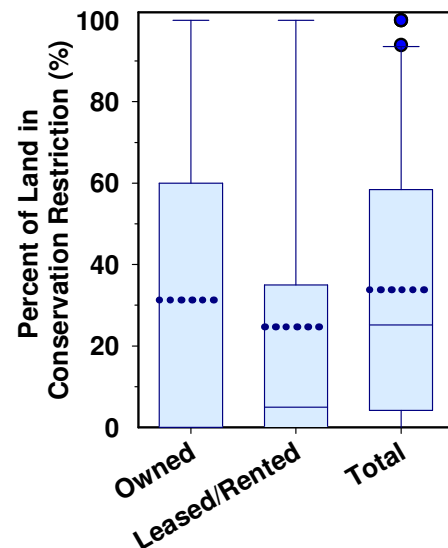


Fig. 47. Percent of owned land, leased or rented lands, and all land farmed by dairy farmers in conservation restriction programs reported by MDPB survey farmers for 2010.



Importance of Other State and Federal Farm Programs

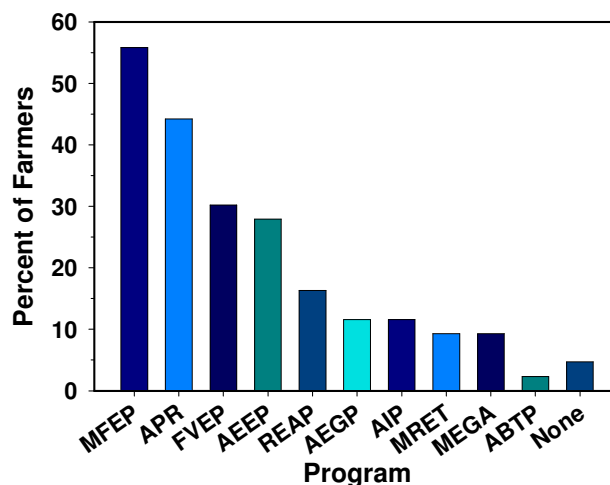
Survey Question:

#12: Which of the following programs have been important to the economic viability of your farm?

Results: Over 50% of MDPB survey farmers reported that the MA Farm Energy Program (MFEP) was important to the economic viability of their farm (Fig. 48). All of the participants in other energy programs, USDA/Rural Energy for America Program (REAP), Agricultural Energy Grant Program (AEGP), and MA Renewable Energy Trust (MRET), also reported that MFEP was important to the economic viability of their farms. About 11% of MDPB survey farms reported that the Agricultural Preservation Restriction Improvement Program (AIP) was important to the economic viability of their farm. More than a quarter of the MDPB survey farmers reported that the Farm Viability Enhancement Program (FVEP) and Agricultural Environmental Enhancement Program (AEEP) were important to the economic viability of their farm.

Key Point: MDPB survey farmers reported that state and federal energy conservation programs and the MA Agricultural Preservation Restriction Program were programs that most contributed to the economic viability of their farms.

Fig. 48. Percent of MDPB survey farmers who identified state and federal programs as having been important to the economic viability of their farm (MFEP: MA Farm Energy Program, APR: MA Agricultural Preservation Restriction Program, FVEP: Farm Viability Enhancement Program, AEEP: Agricultural Environmental Enhancement Program, REAP: USDA/Rural Energy for America Program, AEGP: Agricultural Energy Grant Program, AIP: Agricultural Preservation Restriction Improvement Program, MRET: MA Renewable Energy Trust, MEGA: Matching Enterprise Grants for Agriculture, ABTP: Agriculture Business Training Program)



Summary

MA dairy farmers significantly contributed to the economy of the Commonwealth and local communities through jobs, revenue, taxes, and local purchases. They are much more likely than other U.S. farmers to apply measures to conserve natural resources. They also contribute to their local communities by conserving farmland and agriculture heritage, producing local food, volunteering, and providing recreation access at levels greater than comparison groups.

MA dairy farmers participate in a variety of state and federal programs to improve their farms. It is noteworthy that just as MA Dairy Farm Tax Credit was created in 2008, and the use of MA Agriculture Preservation Restriction Program (APR) and MA Agricultural Environmental Enhancement Program (AEEP) by farmers significantly increased in the late 2000s (per. comm. MA Department of Agriculture Resources), the numbers of dairy farms in the state stabilized after decades of decline. Although circumstantial, these trends may be the best evidence for continuing these programs as a means of enhancing the sustainability of MA dairy farmers. These three programs may have played an essential role in maintaining the economic viability of dairy agriculture and the flow of benefits that they provide to the Commonwealth and its communities.

References

- Breunig, K. 2003 *Losing Ground: At What Cost?* Massachusetts Audubon Society, Lincoln, MA.
- Bruulsema, T. and Q. Ketterings. 2008. Fertilizer BMPs — Best Management for Fertilizers on Northeastern Dairy Farms. International Plant Nutrition Institute, Norcross, GA. Reference # 08052.
- Bryan, J. 2010. Individual Income Tax Returns, 2008. Internal Revenue Service, Statistics of Income Bulletin, Fall 2010.
- Butler, B. 2008. Family Forest Owners of the United States, 2006. Gen. Tech. Rep. NRS-27. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 72 p.
- Dillman, D. 2007. *Mail and internet surveys: The tailored design method*, 2nd ed. John Wiley and Sons, Inc, Hoboken, NJ.
- Dimitri, C., A. Effland, and N. Conklin. 2005. The 20th century transformation of U.S. agriculture and farm policy. USDA, Economic Research Service, National Agricultural Statistics Service. Economic Information Bulletin No. 3.
- Connecticut Department of Economic and Community Development (CT DECD). 2009. The economic and fiscal impacts of Connecticut's dairy industry. Department of Economic and Community Development and the Department of Agriculture in cooperation with the University of Connecticut, Department of Agricultural and Resource Economics, Storrs, CT.
- Cordell, H., D. English, and S. Randall. 1993. Effects of subdivision and access restrictions on private land recreation opportunities. General Technical Report RM231. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 21p.
- Corporation for National and Community Service (CNCS). 2010a. Volunteering in Massachusetts. Corporation for National and Community Service, Washington, DC (Accessed 6/24/11).
- Corporation for National and Community Service (CNCS). 2010b. Research Brief: Volunteering in America Research Highlights. Corporation for National and Community Service, Washington, DC. <http://www.volunteeringinamerica.gov/MA> (accessed 6/24/11).
- Lambert, D., P. Sullivan, R. Claassen, and L. Foreman. 2007. Profiles of US farm households adopting conservation-compatible practices. *Land Use Policy* 24: 72-88.
- Leistritz, F., H. Vreugdenhill, B. Ekstrom, and A. Leholm. 1985. Off-Farm Income and Employment of North Dakota Farm Families. Agricultural Economics Misc. Report No. 88. Agricultural Experiment Station, North Dakota State University, Fargo, ND, 1985.
- Maryland Department of Planning. 2007. The 2007 Census of Agriculture: Sustainability Practices on Maryland's Farms. Maryland Department of Planning, Baltimore, MD.
- Mishra, A., H. El-Osta, and J. Johnson. 2005. Succession decisions and retirement income of farm households, No 32810, Agricultural Outlook Forum 2005, United States Department of Agriculture, Agricultural Outlook Forum, <http://econpapers.repec.org/RePEc:ags:usaofi:32810>.
- National Park Service. 2011. National Registry of Historic Places. Washington D.C. <http://nrhp.focus.nps.gov/natreg/docs/Download.html> (accessed 7/1/11).
- U.S. Census Bureau. 2011. State and County QuickFacts. Data derived from Population Estimates. U.S. Census Bureau, Washington D.C. Last Revised: Friday, 03-Jun-2011 15:22:35 EDT.
- USDA National Agriculture Statistics Service. 2007. 2007 Census of Agriculture: State Profile — Massachusetts. USDA, Washington, DC.
- USDA National Agricultural Statistics Service. 2011a. Agricultural Review, volume 31, number 3. New England Agricultural Statistics, USDA National Agricultural Statistics Service, Concord, NH.
- USDA National Agricultural Statistics Service. 2011b. Livestock, Dairy, and Poultry Outlook - Dairy products: Per capita consumption, United States, 1975-2010. USDA Economic Research Services, National Agricultural Statistics Service, Washington, DC.
- USDA National Census of Agriculture. 2009. 2009 On-Farm Energy Production Survey, www.agcensus.usda.gov/Publications/2007/Online_Highlights/On-Farm_Energy_Production/index.asp. (last accessed June 23 2011).
- Walls, M. 2009. Backgrounder: Parks and Recreation in the United States. Resources for the Future. Washington, DC.
- Whitman, A. 2011. The 2010 Massachusetts Dairy Promotion Board Dairy Farm Impact Survey: A synthesis of results. Manomet Center for Conservation Sciences, Natural Capital Initiative, Manomet, MA. Report NCI-2011-2.
- Zar, J.H. 1999. *Biostatistical analysis*. 4th edition. Prentice Hall, Upper Saddle River, NJ.

Appendix A. Massachusetts Dairy Promotion Board 2010 Dairy Farm Impact Survey

Your farm was randomly selected for the 2010 Dairy Farm Impact Survey. Results from returned surveys (including incomplete surveys) will be used by the Massachusetts Dairy Promotion Board to highlight the economic, social, and environmental value of dairy farming in Massachusetts. Your information will be kept confidential. Please use the enclosed addressed stamped envelope to mail the survey to us by **Friday April 8th**. Thank you for responding to this survey!

1. In what town is the street address of your farm?

2. How many acres of land did you own in 2010?

 ,

acres

3. How many acres of land did you lease or rent or farm that you did not own in 2010?

 ,

acres

4. How many cows did you milk in 2010?

 ,

COWS

5. What was the ratio of your farm revenue (gross income on line 11 on your IRS Schedule F Form) to farm operating costs (total expenses on line 35 on your IRS Schedule F Form) in 2010? [For example, if your farm revenues from line 11 were \$126,554 and your farm operating costs from line 35 were \$103,342, then you would divide \$126,554 by \$103,342 to calculate 1.225, which you would enter in the spaces to the right.]

 .

6. Was the MA Dairy Farmer Tax Credit payment that you received for tax years 2008 and 2009 important to maintaining the economic viability of your farm (payments would have been received in 2009/2010)?

☐ Yes ☐ No

7. How did you use MA Dairy Farmer Tax Credit payment that you received for tax years 2008 and 2009 to help maintain the economic viability of your farm business (payments would have been received in 2009/2010; check all that apply, if "Other", list)?

☐ Debt management ☐ Major capital improvements ☐ Operating expenses ☐ Other: _____

Local Economy

8. How much did your farm business pay in local property taxes and excise taxes in 2010?

\$,

9. How much did your farm business pay in municipal utility bills (water, sewer, and/or trash pick-up) in 2010?

Water \$, Sewer \$, Trash pick-up \$,

10. What were your farm business gross sales from milk in 2010?

\$,

11. What were your farm business gross sales from other agricultural products in 2010?

\$

12. Which of the following programs have been important to the economic viability of your farm (check all that apply, if "Other" list)?

- | | |
|---|---|
| <input type="checkbox"/> None | <input type="checkbox"/> ABTP: Agriculture Business Training Program |
| <input type="checkbox"/> MFEP: MA Farm Energy Program | <input type="checkbox"/> APR: Agricultural Preservation Restriction |
| <input type="checkbox"/> REAP: USDA/Rural Energy for America Program | <input type="checkbox"/> AEGP: Agricultural Energy Grant Program |
| <input type="checkbox"/> MRET: MA Renewable Energy Trust | <input type="checkbox"/> AIP: Agricultural Preservation Restriction Improvement Program |
| <input type="checkbox"/> AEEP: Agricultural Environmental Enhancement Program | <input type="checkbox"/> MEGA: Matching Enterprise Grants for Agriculture |
| <input type="checkbox"/> FVEP: Farm Viability Enhancement Program | <input type="checkbox"/> Other: _____ |

13. How important is income from off-farm employment to the economic viability of your farm (check one box)?

☐ Very important ☐ Important ☐ Not important ☐ Not applicable (no one is employed off the farm)

14. What percentage of your family net income is from off-farm employment? %

15. How many full-time equivalent (FTE = 40 hrs/week) employees did your farm business have in 2010? FTE

16. Which of the following supplies or services were mostly ($\geq 50\%$) purchased from suppliers or service providers inside Massachusetts in 2010 (check all that apply; if "Other", list)?

☐ None ☐ Farm equipment ☐ Equipment repair ☐ Milk room equipment ☐ Veterinary services
☐ Veterinary supplies ☐ Feed ☐ Hardware ☐ Seed ☐ Fertilizer ☐ Chemicals and sprays
☐ Heifer replacements ☐ Gasoline, fuel, oil ☐ Other: _____ ☐ Other: _____

17. What percentage of your expenditures for supplies and services were spent on suppliers and/or service providers outside of Massachusetts in 2010? %

18. What was your farm business total payroll (including workers' compensation and unemployment insurance) in 2010?

\$

19. What was the financial value of fringe benefits (e.g., health insurance, food, housing, transportation, vehicle use) provided to employees in 2010?

\$

Food Production

20. What was your annual milk production in 2010?

CWT

21. What other agricultural products from the farm were sold in 2010 (check all that apply, if "Other", list)?

☐ None ☐ Vegetables ☐ Apples/tree fruits ☐ Berries ☐ Flowers ☐ Nursery stock
☐ Eggs ☐ Poultry ☐ Meat ☐ Manure/compost ☐ Heifers and calves ☐ Maple syrup
☐ Hay ☐ Christmas trees/greens ☐ Honey ☐ Other: _____
☐ Other: _____ ☐ Other: _____ ☐ Other: _____

22. Which of your agricultural products were direct marketed to consumers in 2010 (check all that apply, if "Other", list)?

☐ None ☐ Dairy products ☐ Vegetables ☐ Apples/tree fruits ☐ Berries ☐ Flowers
☐ Nursery stock ☐ Eggs ☐ Poultry ☐ Meat ☐ Hay ☐ Manure/compost ☐ Firewood
☐ Maple syrup ☐ Christmas trees/greens ☐ Honey ☐ Baked goods
☐ Other: _____ ☐ Other: _____ ☐ Other: _____

23. What percentage of your gross sales were direct marketing expenses for dairy products in 2010?

%

Community Contributions and Relations

24. Which of the following types of organizations did you volunteer for in 2010 (check all that apply, if "Other", list)?

- ☐ None ☐ Church ☐ Agricultural organizations (Grange, co-ops, etc.) ☐ Civic clubs ☐ Land trusts ☐ 4-H
☐ PTA/Booster club ☐ Scouting organizations ☐ Town selectman/council ☐ Agriculture commission
☐ Conservation commission ☐ School board ☐ County committees ☐ Planning commission/board
☐ Emergency/public safety service ☐ Other: _____ ☐ Other: _____

25. Please estimate the number of hours you volunteered in 2010 for charitable organizations:

_____, ____ hrs

26. Please estimate the number of hours you volunteered in 2010 in local government:

_____, ____ hrs

27. Did you make charitable contributions of services (e.g., mowing) and/or materials, including agricultural products (e.g., lumber, food) in 2010?

☐ Yes ☐ No

28. What was the value of your charitable contributions in 2010?

\$ _____

29. How many charitable and/or non-profit organizations did you financially donate to in 2010?

____ organizations

30. How many visitors toured and learned about dairy agriculture on your farm in 2010 (estimate if necessary)?

____ people

31. Do you employ practices to reduce the odors associated with manure spreading?

☐ Yes ☐ No

32. Do you employ practices to minimize the effect of fly populations on your neighbors?

☐ Yes ☐ No

33. What other practices and strategies do you employ to be a good neighbor (check all that apply, if "Other", list)?

- ☐ Notify neighbors when moving/applying manure ☐ Provide your neighbor with your contact information
☐ Provide small amounts of manure to your neighbors ☐ Locate new farm buildings away from property lines
☐ Routinely talk to neighbors about your farm ☐ Other: _____

34. How would you describe the level of community support for dairy farming in your community or town (check one box)?

☐ Very supportive ☐ Supportive ☐ Neutral ☐ Unsupportive ☐ Very unsupportive

35. How many acres of land (including land that you do not own but control access) did you make available for recreational access (defined as allowing non-family members access for recreation) in 2010?

_____, ____ acres

36. Approximately how many recreational users accessed this land in 2010?

____ people

37. Do you have any established public facilities (winter or summer trails, boat ramps, water access, etc.) on your property used for recreational purposes?

☐ Yes ☐ No

38. What level of public access to your property do you provide for recreational activities (check one box)?

- ☐ No access is allowed ☐ Written or verbal permission is needed to access part or all of my land
☐ Anyone can access part or all of my land at any time ☐ Designated groups and/or clubs are allowed

39. If access is permitted, which of the following activities take place on your property (check all that apply, if "Other", list)?

<input type="checkbox"/> Hunting	<input type="checkbox"/> Fishing	<input type="checkbox"/> Trapping	<input type="checkbox"/> Winter trail use	<input type="checkbox"/> Summer trail use	<input type="checkbox"/> Boating
<input type="checkbox"/> Bird watching	<input type="checkbox"/> Photography	<input type="checkbox"/> Painting	<input type="checkbox"/> Picnicking	<input type="checkbox"/> Other: _____	

Agricultural Heritage and Conservation

40. How many generations has your dairy been in your family? generation(s)

41. How many generations live and/or work on your dairy? generation(s)

42. Are you planning to transfer your farm business to the next generation (does not have to be a family member) (check one box)?

☐ No

☐ Undecided

☐ Yes

43. If yes to # 42, do you have an agreement or plan to transfer your farm business to the next generation (check one box)?

☐ No

☐ Informal plan/verbal agreement

☐ Written plan

44. Please list the conservation programs in which you participated in 2010 (check all that apply, if "Other", list):

<input type="checkbox"/> None	<input type="checkbox"/> Conservation restriction/easement on my farm
<input type="checkbox"/> Lease/rent state land	<input type="checkbox"/> MA APR – Ag. Preservation Restriction Program
<input type="checkbox"/> MA AEEP - Ag. Environmental Enhancement Program	<input type="checkbox"/> NRCS AMA - Ag. Management Assistance
<input type="checkbox"/> Mass. Taxation Law Chapter 61, 61a, 61b, or 61c	<input type="checkbox"/> NRCS CSP- Conservation Security Program
<input type="checkbox"/> NRCS GRP - Grassland Reserve Program	<input type="checkbox"/> NRCS WHIP - Wildlife Habitat Incentive Program
<input type="checkbox"/> NRCS FRPP - Farm & Ranchland Protection Program	<input type="checkbox"/> NRCS EQIP- Environmental Quality Incentives Program
<input type="checkbox"/> NRCS WRP - Wetlands Reserve Program	<input type="checkbox"/> Other: _____

45. Of land you own, how many acres were permanently protected through an agricultural preservation restriction or conservation restriction at the end of 2010?

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	acres
----------------------	----------------------	----------------------	----------------------	-------

46. Of land that you leased or rented or used in 2010 but did not own, how many acres were permanently protected through an Agricultural Preservation Restriction or conservation restriction/easement when you used them?

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	acres
----------------------	----------------------	----------------------	----------------------	-------

47. Did you maintain farm buildings or structures >60 years old that are visual reminders to your community of its agricultural heritage?

☐ Yes

☐ No

48. Did you add to the scenic appeal of your farm by employing any of the following practices in 2010 (check all that apply, if "Other", list)?

<input type="checkbox"/> None	<input type="checkbox"/> Cropping in visible areas	<input type="checkbox"/> Visible farm sign	<input type="checkbox"/> Mowing roadsides
<input type="checkbox"/> Landscaped farm entrance	<input type="checkbox"/> Trash removal	<input type="checkbox"/> Newly sided/painted building (visible from road) in the last 10 years	
<input type="checkbox"/> Pasturing along roadsides	<input type="checkbox"/> Other: _____		<input type="checkbox"/> Other: _____

Farm Stewardship

49. Did you have a state or NRCS-approved nutrient management plan in 2010?

☐ Yes ☐ No

50. What percentage of field acres planted to annual crops (corn, cereal grain, soybeans, or other) had cover cropping over the winter 2010-2011?

%

51. How often do you test the soil in your fields (check one box)?

☐ >Every 5 years

☐ Every 4 to 5 years

☐ Every 2 to 3 years

☐ Every year

52. Do you apply soil best management practices when needed to minimize erosion?

☐ Yes ☐ No

53. Do you apply best management practices for all pesticide, herbicide and/or fungicide applications?

☐ Yes ☐ No

54. Which agricultural cropping practices do you uniformly adopt across your farm fields to minimize nutrient run off and address potential water quality issues (check all that apply, if "Other", list)?

☐ None ☐ Strip cropping ☐ Cover cropping ☐ Stream buffers when applying manure & chemicals ☐ Contour farming

☐ No-till/reduced tillage practices ☐ Other: _____ ☐ Other: _____

55. What percentage of your total acreage was made up of land that was managed primarily for wildlife species or was not managed for agriculture and is suitable for wildlife habitat in 2010?

%

56. On what percentage of your acres cropped or managed for forage did you apply wildlife conservation practices in 2010?

%

57. How many acres of land did you own in 2010 that were forested?

, acres

58. What alternative energy sources did you use in 2010 (check all that apply, if "Other", list)?

☐ None ☐ Windmills ☐ Solar panels ☐ Outdoor boiler ☐ Other wood energy ☐ Methane digester

☐ Geothermal ☐ Other: _____ ☐ Other: _____

59. What energy conservation measures or upgrades have you applied in the last 5 years (check all that apply, if "Other", list)?

☐ None ☐ Energy audit ☐ Pre-heaters ☐ High-efficiency lighting ☐ Variable speed pumps

☐ Plate-type cooler ☐ No/reduced tillage practices ☐ Employed practices that reduce number of passes across field

☐ Upgraded to fuel efficient equipment ☐ Energy efficient barn fans ☐ Other: _____

We will mail reminders to encourage farmers who received the survey to return it.
To avoid being sent a reminder, please print your last name here:

Thank you for participating in the Massachusetts Dairy Promotion Board survey!



Science at Work
— for a —
Sustainable World

Manomet's mission is to conserve natural resources for the benefit of wildlife and human populations. Through research and collaboration, Manomet builds science-based, cooperative solutions to improve sustainability.

*Natural Capital, or ecosystem services, includes all goods and services that we get from nature, such as clean water and air, food, carbon, biodiversity, and wood products.
The Natural Capital Initiative at Manomet is helping people conserve these natural resources to sustain our well-being, environment, and prosperity.*

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