United States Department of Agriculture
Midwest Climate Hub

Adaptation Resources for Agriculture
A Case Study: Organic Dairy in Wisconsin

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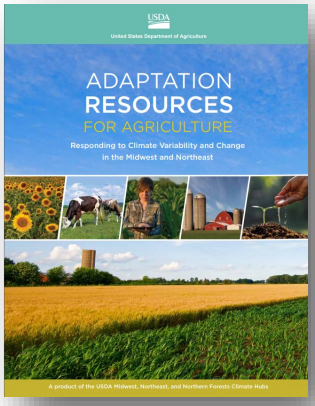

The Adaptation Resources for Agriculture Workbook was jointly developed by USDA Climate Hubs and NRCS to support producers, service providers, and educators in the Midwest and Northeast Regions to manage climate change. The workbook helps producers consider both short-term adaptive management actions (<5 years) and long-range strategic plans (5 to ~20 years, subject to farm type). This workbook promotes adaptation through multiple resources including a "menu" of many adaptation strategies/approaches and example tactics for row cropping and forages, confined livestock, grazing, orchards and small fruit and vegetable production systems. Recent efforts by USDA Climate Hub NRCS Liaisons work to increase the number of examples, and have been documented as Case Studies. These Case Studies are of agricultural producers utilizing the workbook to document their management choices to ameliorate climate change impacts to their operations.

R & G Miller & Sons: An Organic Dairy Farm in Wisconsin

The working farm lands of Wisconsin are important and dominate part of the state's drumlin region. They provide a multitude of agricultural products and jobs to the area. One of the many challenges facing the dairy producers within this region and throughout the U.S. is climate change. R & G Miller & Sons of Columbus, WI participated in the Adaptation Workbook 5-step process to see if there are ways for their operation to become more resilient to a changing climate.

1 **DEFINE:** The first step is to lay out management goals and objectives: For R & G Miller & Sons, this is to continue to produce the highest quality organic milk without sacrificing the health or comfort of their herd. They also want to maintain or increase surplus yields of grain and hay for revenue and/or reserve stocks and maintain a diverse land use that includes rotational grazed pasture and cropland.

2 **ASSESS:** There are numerous climate change impacts and vulnerabilities that will affect Wisconsin agriculture. R & G Miller & Sons noted two impacts that will undoubtedly present challenges to their operation: An increase in temperatures (via increased intensity in summer heat waves (i.e. more days at 95°F and/or increased night-time temperatures) and higher frequency/intensity of extreme precipitation events. Any increased temperatures will stress livestock thus reducing milk production.

3 **EVALUATE:** What management challenges and opportunities may occur as a result of climate change? In the table (see back) the management challenges and opportunities that may occur as a result of climate change are recorded with the feasibility of meeting management objectives under current farm management listed—All of which were high. Other considerations for each land unit were recorded as 'market process and availability'.

Like many producers in Wisconsin, R & G Miller & Sons is already seeing an increase in intense precipitation events particularly in spring. This delays planting and prevents early season grazing due to possible damage/ compaction from cow traffic on saturated pastures. Extended wet periods (e.g. 5 in of rain or more/week) and big deluge rains also lead to ponding in some areas of fields, which in turn leads to reduced productivity of pastures.

Step 3: EVALUATE Management Objectives Given Projected Impacts and Vulnerabilities			
Land Unit	**Objective**	**Challenges to Meeting Management Objective with Climate Change**	**Opportunities for Meeting Management Objective with Climate Change**
Cropland	Utilize targeted fertilization management system to maximize variable rate technology to increase yields	*Heavy rain/wet spring condition*-more difficult to get into fields in spring, ponding-make it harder to plant, haul manure in spring/fall; Ponding reduces yields *Drought*-decreases yields	Crops will benefit from longer growing season as long as there's enough moisture; Seed companies are keeping up with some changes (e.g., drought-tolerant corn) and more options are available; Plant some crops (Winter tricale & wheat) during fall and could do more of that for forage or grain (would reduce corn acres)
Pasture	Maintain productive cow herd while maintaining good vegetation; Continue to increase acres of pasture interseeded; Maintain and increase plant/pasture productivity	*Wet spring conditions*-more difficult to get cows out (access in lanes, muddy/greasy with all the traffic); Potential for more disease with prolonged wet conditions; Diseases do reduce productivity of plants (orchard grass) *Drought*-decreases yields; Grasses shut down and increases need to feed	Pasture will benefit from longer growing seasons as long as there's enough moisture
Farmstead	Improve/increase energy efficiency of milking and housing facilities	*More intense heat*-would require greater cooling within buildings (current design is mostly natural ventilation w/o misters); *Increased spring precipitation or larger events*-causes manure storage lagoon to fill faster; too much precip at once means hauling at inopportune times, risking compaction, rutting, etc.	N/A 

4 **IDENTIFY:** The fourth step of the process is brainstorming tactics that farmers can implement to enhance the farm's ecosystem's ability to adapt to climate change and meet management goals. Through workbook exercises, R & G Miller & Sons discovered numerous tactics that they are or could implement: plant fall crops for a forage or grain the following spring; increase cover crop usage; reduced tillage regime; increase interseeding efforts in pastures; shift pasture planting varieties and increase rehab; and upgrade cow lanes to pastures.

5 **MONITOR:** Throughout the workbook exercise it was clear that R & G Miller & Sons continually look for avenues to improve the land that provides for their organic dairy herd. Via their mission and vision, they are able to simultaneously consider how to mitigate their direct affects on the changing climate and adapt to the current/anticipated changes in climate to become a local leader in environmental stewardship (*i.e.* monitor and evaluate effectiveness of implemented tactics).

The Take-Away

The Adaptation Resources for Agriculture Workbook can be a valuable process for any agricultural producer to undertake as long as one is willing to think outside the box and look beyond next year's cropping or grazing season. Take action now to improve your operation and production resiliency.

For more information, contact:

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