

Conservation Corner for January 9, 2018

Upgrade the Farm

How to Harvest More from the Energy you have

by Jodi DeHate

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Everyone likes to save money, right? What things in your home have you switched out to make your energy or electric bill less? Energy star appliances, LED or CFL lights, better windows, or maybe even more insulation to keep the heat or cool air in? Have you ever thought about what farms might do to try to conserve energy?

Older buildings but new technology

Not all of us are fortunate enough to live in a brand-new home, so as homeowners we upgrade where we can as money and time allows. The same can be said of many farms that operate in older buildings. Just like energy audits that homeowners can take part in, farmers can utilize energy audits that can help them assess where improvements need to take place. Simply replacing old halogen or florescent lights with an LED (light emitting diode) saves a lot of money in not only bulb replacement and cost, but in how much less energy they use. One farm said the LED lights cost \$30 vs \$300 for the old halogen lights. Plus, they use about 85% less energy. Not only do they cost less and use less energy, they also shine brighter. Think of flashlights of just 5 years ago, you know the big heavy ones that gave pretty decent light. Now you can buy a small LED one and it shines 10 times brighter.

Other fairly easy fixes are insulation, variable frequency drive (VFD's) pumps and motors which use electric. VFD's use less energy, save motors, and are just more efficient to run. They only use the amount of electric needed when it's needed. The non-VFD electric motors used a constant draw of electric even though the piece of machinery may not have needed it. This is over simplified of course, but that's the easiest way to explain VFD motors.

Audits

Many cooperatives like Michigan Milk offers an energy audit for its producers. Michigan State University Extension also offers an audit program for farmers. As well as the electric companies themselves. Most electric companies have a team of individuals that specifically service farms and their needs.

Spud life extended

As farms expand and age new buildings are pretty much needed to keep up with the growth of the farm--not to mention buildings don't last forever. In talking to the inspiration of this article, Ed Dracht, owner and operator of Dracht Construction near Marion, pointed to what technology is used in new construction. Ed and his crew have built several Butler buildings using Techmark designs and technology for potato farms throughout Northern Michigan. His latest was for Kitchen farms in Antrim, and he's built one for Eisenga Family Farms in Marion, and Elmaple farm near Kalkaska.

The Techmark products and designs specifically control temperature, moisture, and air flow in storage for food crops like potatoes, apples and mushrooms. These new buildings reduce a lot of wasted produce. Bruce Cotton, one of Elmaple's owners, said they have reduced potato shrinkage due to loss of moisture by half since they have been storing potatoes in the newest building using Techmark technology. The system has also reduced pressure bruising. Pressure bruises are caused by not enough humidity in the storage area.

Cows can be misers too

New dairy facilities take advantage of new technologies as well. The cooling of milk is an example as seen in these steps.

1. Milk is run typically through a plate cooler
2. Milk is cooled through plates that come in contact with very cold water
3. The plate cooler water is warmed by this process
4. The milk is pumped into a large tank
5. The milk continues to be cooled until it reaches just below 40° F

All this cooling takes a lot of energy and creates, ironically, a lot of heat. In some cases, the heat is captured and reused elsewhere.

The plate cooler water is captured and often fed to the cows. For whatever reason cows love the warm water. The warm water can be used to clean and sanitize the milking equipment. The dirty water is then pumped into the manure pit, where it's eventually spread on crop ground. Talk about ultimate recycling!

The condensers and compressors used to cool the milk take a ton of energy. Many farms have gone to different type of compressor called a scroll compressor. This saves energy usage as high as 20% over the older models.






Ventilation in barns is a major part to good animal care. That means fans and maybe sprinkler systems in barns. It also means sidewalls that are curtains instead of a solid wall. Sensors that are installed in barns can lower or raise those curtains to provide proper temperature and ventilation in barns. Those sensors can also automatically turn on fans. Many of these electric pumps and motors use the VFD's to ensure less energy usage.

Green for everyone

This article just touches on some of the ways farms can save energy and be greener. If you want to learn more about these programs or how to have an audit done on your farm please contact Jodi DeHate, Michigan Agriculture Environmental Assurance Program Technician for Missaukee, Crawford, Kalkaska and Wexford Counties, at 231.839.7193, jodi.dehate@macd.org or stop by the Missaukee Conservation District at 6180 W. Sanborn Road, Lake City.



Air tubes are being installed in Kitchen Farm construction project. Photo credit: Dracht Construction

	<p>Air diffusers are being installed in Darwin Eisenga's Kitchen Farm construction project. Photo credit: Dracht Construction</p>
	<p>Close up of air diffusers installed in Darwin Eisenga's Kitchen Farm construction project. Photo credit: Dracht Construction</p>
	<p>Steel frame of Kitchen Farm. Photo credit: Dracht Construction</p>
	<p>A storage room in the Kitchen Farm where potatoes will be kept at optimum temperature and humidity. Photo credit: Dracht Construction</p>
	<p>Darwin Eisenga checking controls of potato storages. Photo credit Darwin Eisenga</p>

