

“How wonderful
is it that nobody
need wait a single
moment before
starting to improve
the world”
—Anne Frank

Thank you for your
willingness to
help with the goal of
achieving
sustainability for
our children,
grandchildren
and their futures

Interested in an
educational
presentation about
sustainable agriculture
and forestry
for your club?
—contact us.

We have a -30 minute
presentation which is
easily expanded with a
question and answer
session.

The purpose of this scholarship is to provide financial aid to individuals growing up in southeast Minnesota who are committed to sustainability in the fields of agriculture and forestry, have demonstrated leadership and communication skills, and are interested in pursuing a career in sustainable agriculture and/or forestry. Sustainable practices ensure clean water, health regenerative soils, and vibrant rural communities for future generations. The scholarship fund seeks to find the next generation of agricultural and forestry professionals who will learn how to manage our environment on a completely sustainable basis, provide food, fiber and shelter for people, and in the process protect our precious natural resources for our children and those yet to come.

If you too are concerned about the indiscriminate use of chemicals which are killing our pollinators, polluting our water, and negatively effecting our food supply, then JOIN US by donating today.

Contributions to the Fund are fully tax deductible.

Methods of contributions are numerous:

- ★ A check or credit card is wonderful
- ★ Matching funds from employer.
- ★ Direct transfers from an IRA.¹
- ★ Endowments through your Estate Plan, wills or life insurance policies.¹

¹ See website for method and be sure to contact your financial advisor, accountant or lawyer for advise.

The Scholarship Endowment Fund is structured such that only earnings from the invested capital are used to pay for scholarship(s) and Fund operating expenses. This rule assures that the Fund will operate in perpetuity. The Rochester Area Foundation (RAF) is the steward of the Fund. RAF's administrative fees are 1.25% of the annual



Please help us find qualified candidates

Tell friends and neighbors about the scholarship. Two of our recipients did learn about it this way. Feel free to send us contacts to whom we can send information. Each scholarship is for \$5,000 and recipients are free to apply again in following years. Details are available on our website:

www.protectourresources.org

fund balance and are amply covered by RAF's investment performance. Neither scholarships nor fees are reducing the endowment equity!

100%
of your
donation
goes to
build this
endowment
fund!*

<http://protectourresources.org>

Please share this Newsletter with others
who might be interested in helping the cause. Thanks!

Educational Resources

The Scholarship founders not only work on building the endowment funds. They also operate a website, mail this newsletter twice a year to interested individuals at no cost, and provide presentations—all to bring awareness to people in south east Minnesota about the need to think sustainably in order to protect our futures. The following organizations have received the presentation “Healthy Soils—the Key to Our Survival.”

Kiwanis of Lake City
The Womans Club of Lake City
The Lions Club of Lake City
The Rotary of Lake City
The Izaak Walton League of Wabasha (Wapabsa Ikes)

As a result of the presentation, the Womans Club and the Wapasha Ikes also voted to donate to the endowment fund in addition to several member donations. Thank you.

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—contact us. We have a -30 minute presentation which is easily expanded with a question and answer session.



To access the website with all its references, current and past newsletters, scholarship information, donor list and more, use your smart phone to scan the QR code.

For more details and references related to articles in this news -letter, visit our website:

www.protectourresources.org



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Issue 10

Sustain US

December
2019

By Protecting Our Resources

The Sustainable Agriculture & Forestry Scholarship Endowment Fund Newsletter

Regenerative Agriculture: Merging Farming and Natural Resource Conservation Profitably

This research compared a total of 40 fields on ten farms practicing regenerative agriculture with 36 fields on eight farms practicing conventional agriculture. Here is the abstract:

“Most cropland in the United States is characterized by large monocultures, whose productivity is maintained through a strong reliance on costly tillage, external fertilizers, and pesticides (Schipanski et al., 2016).

Despite this, farmers have developed a regenerative model of farm production that promotes soil health and biodiversity, while

producing nutrient-dense farm products profitably. Little work has focused on the relative costs and benefits of novel regenerative farming operations, which necessitates studying *in situ*, farmer-defined best management practices. Here, we evaluate the relative effects of regenerative and conventional corn production systems on pest management services, soil conservation, and farmer profitability and productivity throughout the Northern Plains of the United States. Regenerative farming systems provided greater ecosystem services and profitability for farmers than an input-intensive model of corn production. Pests were 10-fold more abundant in insecticide-treated corn fields than on insecticide-free regenerative farms, indicating that farmers who proactively design pest-resilient food systems outperform farmers that react to pests chemically. Regenerative fields had 29% lower

Always
leave
the soil
better
than you
found it

“Monocultures
are a
detriment
to soil
health.”
—Gabe
Brown,
North
Dakota
farmer on
10,000
acres

“When we
try to pick
out
anything
by itself,
we find it
bitched to
everything
else in the
Universe.”
—John
Muir

“If we are going to ask farmers to respect soil and do a few things which may not be of short term economic benefit to them, then the society as a whole has an obligation to compensate them for that.”
Dr. Rattan Lal, one of the most renowned soil experts in the world.

grain production but 78% higher profits over traditional corn production systems. Profit was positively correlated with the particulate organic matter of the soil, not yield. These results provide the basis for dialogue on ecologically based farming systems that could be used to simultaneously produce food while conserving our natural resource base: two factors that are pitted against one another in simplified food production systems. To attain this requires a systems-level shift on the farm; simply applying individual

regenerative practices within the current production model will not likely produce the documented results.”

LaCanne CE,
Lundgren JG. 2018.

Regenerative agriculture: merging farming and natural resource conservation profitably. PeerJ 6:e4428 <https://doi.org/10.7717/peerj.4428>

A New Organization Formed to Advance the Interest of Private Well owners.

The Minnesota Well Owners Organization—MNWOO—

- ✓ will help navigate the maze of fragmentation of water regulation through state agencies
- ✓ advocate in local, state, and federal issues
- ✓ educate, train and assist with local water issues
- ✓ provide technical advice and discount on services
- ✓ advice on type and timing of well testing
- ✓ provide awareness of regional events and news

Details at <https://mnwoo.org>

Land Stewardship[Project's (LSP) Statement on the Current Farm Crisis:

- The 2018 median farm income for U.S. farm households was negative \$1,533
- For six years, more than half of farmers and ranchers have lost money on their crops or herds.
- 70% of the total income of farm families comes from off-farm sources.

The pain of the crisis is not being felt by agribusiness and corporate interests that continue to make profits at the expense of farmers and rural communities. The fact is that there is money in agriculture, but farmers are not getting anywhere close to a fair share of the economic benefits being generated by the food they labor to produce on the land.

Failure to address the destruction of farm-level profitability is not acceptable and is producing devastating results. The combined impact of these structural forces—left to play out without intervention from our elected representatives, our public officials, and farmers themselves—may very well lead to the extinction of the next wave of the kinds of small to mid-sized farm operations, particularly dairy farmers, that are the source of vitality for rural communities. Long term food security and environmental stewardship require more farmers, not less, and stronger rural communities, not weaker ones.

Every time we lose seven farmers, we lose one business in the community.

For details and to provide help:
<https://landstewardshipproject.org>

Water is Life

Clean and Safe Groundwater, Rivers, Streams and Lakes are Essential to Our Lives and Livelihoods

Minnesota: The Land of More Than 4,000 Impaired Lakes & Streams*

BLUE-GREEN ALGAE

Harmful Blooms: Cyanobacteria, also known as blue-green algae, can proliferate in lakes when exposed to heat and excess phosphorus—a nutrient common in agricultural runoff. They produce toxins that can sicken people, and they can kill pets, livestock and wildlife. Ibid pg 23

“UNFIT FOR RECREATION”

“1 OR 2 DOG DEATH NOT UNCOMMON”

Another example of blue-green algae

WATER WARNING



AVOID CONTACT WITH THE WATER

This water contains a blue-green algal bloom that can be harmful to humans and pets.

For your safety:

- Do not swim, waterski, or tube in the water
- Avoid swallowing water
- Stay away from areas of scum when boating

Map of Impaired Waters, Draft 2020

<https://www.pca.state.mn.us/water/impaired-waters-viewer-iwav>

* There are 3,416 waterways in the Minnesota inventory which show a range of problems, including excess mercury, bacteria, phosphorus, nitrate and other pollutants, as well as struggling fish and insect populations. The 3,416 bodies of water represent 56% of the state's waters; they include some well-known rivers, such as the Blue Earth and the Crow, as well as hundreds of tiny streams and creeks. The state has finished a 10-year sampling effort and now has a complete inventory of contaminated waters, a tool that can be used to track future progress in reducing water pollution. Too much phosphorus — found in farm fertilizers, manure, sewage and industrial waste — can cause eutrophication, reducing the oxygen in water and choking out fish and other aquatic life. It can also fuel toxic blue-green algal blooms.

If mercury contamination is excluded from the inventory, “only” 40% of Minnesota waters are impaired.

Blue-green algae blooms contain powerful natural poisons. These toxins include *hepa- toxins* that cause liver injury and *neurotoxins* that act on the nervous system. Contact with water containing these toxins has resulted in rashes, respiratory problems, and gastroenteritis in humans. Dogs, livestock, and wildlife are also highly susceptible to the toxins; it is not unusual to hear of animals getting sick or dying after drinking or swimming in water that contains blue-green algae.

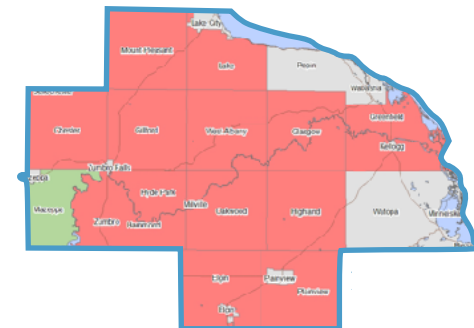
We can't eliminate blue-green algae from a lake—they are an inherent part of the overall algal community. What we really want to do is control their overall intensity and the frequency of the blooms. Since we can't control the water temperature, the best thing we can do is to reduce the amount of nutrients getting into the lake. This can best be accomplished by reducing the amount of phosphorus and nitrogen from man-made sources such as lawn

fertilizer, and runoff from cities, cultivated fields, feedlots, and a myriad of other sources. Though a reduction of nuisance algal blooms will not be immediate, it is the best long-term solution to minimizing the frequency and intensity of algal blooms.

(MNPCA and Star Tribune 11/13/2019)

Why is nitrate a concern?

A growing body of literature suggests associations between nitrate exposure and health effects such as increased heart rate, nausea, headaches, and abdominal cramps. Some studies suggest an increased risk of cancer, especially gastric cancer, from consuming nitrate/nitrite in drinking water, but there's not scientific consensus. High levels of nitrate can also cause a fatal condition called methemoglobinemia (blue baby syndrome) in infants. (EQB 2019)



For example: Wabasha County Townships with Impaired Wells are shown here. Other SE MN counties experience similar or worse situations

Contaminated wells in Wabasha ranged from 2.4% in Mazeppa to 33.8% of wells tested in Plainview. 31.1% of tested wells have nitrates above 3%. Red townships = More than 10% of wells has more than 10 Mg/L Nitrate

Removing nitrates from tap water is expensive:

In Minnesota, the cost of building new water treatment systems that experienced excess pollution in their drinking water: (Source: EQB report)

- Clear Lake, Pop. 525, \$8,284 per household (ph)
- St. Peter, pop. 11,196, \$1,744 ph
- Adrian, pop. 1,209, \$3,597 ph

The annual operation and maintenance cost can be from 3 to 10% of acquisition

Clean Water, Clean Air, Healthy Soil—the Key to Our Survival

cost. Systems may have a life of 20 years. Adrian has experienced two system failures with costly repairs since their system was installed in 1998.

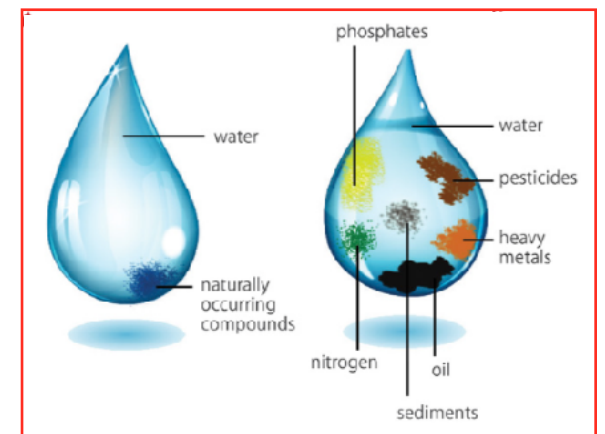
When faced with high concentration of nitrates, private well owners have two choices: drill new deeper wells or treat the water at the tap. The former involves significant well drilling costs and from 3 to 5 times higher energy costs—forever.

Installing treatment at the tap also has first costs and cost in use.

It is more economical to prevent water problems than clean up after they occur.

The Current Drinking Water Quality Standard May Be Unsafe

Nitrate is a contaminant in water. Our drinking water is considered safe if the nitrate concentrations are less than 10 milligrams per liter of water (10 mg/l). This number is a standard set by the Safe Drinking Water Act of 1974. The number is based on data on baby blue syndromes (a potential killer) collected in 1951. This was not a scientifically rigid study. When standards for protection of the public are established based on research, a safety factor (also known as uncertainty factor) is applied. This is normally 10x—if x is an apparent limit, then 10x should be safe accounting for uncertainties. This is not the case for the nitrate standard which was established based on, now, 78 year old information. Additionally, recent studies suggest an increased risk of, for ex., cancer, from consuming nitrates in drinking water. This risk may reflect a long term exposure which is not reflected in the 10 mg/l standard. Test your water regularly. Treat if you have more than 3 mg/l of nitrates. Learn more by reading this article at the Environmental Working Group (EWG): <https://www.ewg.org/research/pouring-it/health-effects-nitrate-exposure>



This image from an Environmental Quality Board's publication demonstrates the negative impact humans have on water quality compared to historic water purity. Clean, safe water should be a right!

If you have more than 3 mg/l of nitrates in your well water, you are 90% sure to also have pesticides present.