



MINNESOTA STATE ENVIROTHON

2019 MN State Envirothon Scenario

Agriculture and the Environment – Knowledge & Technology to Feed the World

The Oliver Kelley Farm (OKF) is a Minnesota Historical Society site that was home to Oliver Kelley, the founder of the national farming organization, the Grange. OKF maintains historic buildings, livestock, and several acres of gardens and cropland. The site is open to the public and sees roughly 40,000 visitors a year, including school groups, families, and individuals. Three years ago, OKF opened a new program space - Farm Lab - that tells the story of modern Minnesota Agriculture. As part of Farm Lab, OKF created living exhibits, including turning over ten acres of new cropland.

This new cropland will be planted with corn, soybeans, wheat, and sugar beets. Growing these crops will enable OKF to showcase the crops vital to modern Minnesota agriculture. Visitors to the Oliver Kelley Farm will explore the crops and get a closer look at the plants that produce their food and other products. Staff, who are tasked with educating visitors about the story of agriculture in Minnesota, will use the crops as living artifacts to help communicate this story.

The soil type and climate at OKF require that, to maintain high yields, most crops be grown with irrigation. Many types of irrigation options are available Minnesota's farmers. OKF wishes to select irrigation types best suited to its needs and property. This irrigation method must be economically sound, feasible, environmentally responsible, and compatible with the cultivation of corn, soybeans, wheat, and sugar beets. The water for this irrigation system will come from a well on the property.

Because the Farm Lab cropland is also an exhibit, it must be representative of how crops are raised in the rest of Minnesota now, and in years to come. At the same time, as a public and historic site, OKF must adhere to guidelines that do not confine other Minnesota farms.

The Oliver Kelley Farm is designated as a National Historic Landmark. As such, it is subject to state and federal standards regulating land management. These include:

- A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships.
- The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.

- New additions, exterior alterations or related new construction will not destroy historic materials, features and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.
- New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

OKF is also guided by the values included in its mission statement:

The Oliver Kelley Farm tells the story of the Kelley Family and Minnesota's agriculture---past, present and future---to nurture an understanding of where our food comes from and agriculture's impact on our world. We accomplish this by providing engaging experiences that enable visitors to understand and learn in ways that enrich their present lives and help them shape a better future.

Excellence

- We are an authentic working farm
- We create well-researched and non-biased programs
- We strive to attain consistently high levels of customer satisfaction

Engagement

- We provide hands-on activities for all visitors
- We encourage thought provoking discussion
- We seek to assist people in discovering their history

Community

- We actively and purposefully participate in our community
- We value diverse audiences and seek to meet their needs
- We value genetic diversity in plants and animals and strive to preserve it

Personal

- We value individuals and the sharing of their stories
- We are a place to be your family farm, where families work and play together
- We connect people to the story of the food they eat

Once an irrigation system is installed at the Oliver Kelley Farm, it will become a part of programming for both casual visitors and school groups.

One of OKF's school programs for middle and high school students is called "Minnesota Feeding the World." In this program, students examine topics such as changing farming methods, food waste reduction, concerns related to raising animals, and the careers that can solve our food shortage dilemma. By examining these issues, students look for answers to the question "how can Minnesota help feed the 9 billion people expected to live on this planet in 2050?" With a changing climate and more expected droughts in Minnesota, irrigation will continue to be a critical component to producing food here. OKF's irrigation system will act as a program element to discuss how irrigation may help produce food to "feed the world."

Expectations

The Oliver Kelley Farm has contracted you put together an irrigation plan for their Farm Lab cropland. As a part of this plan you will need to:

- Decide on the best type of irrigation system for this land
- Discuss the potential and expected impacts of this system on the environment surrounding the Kelley Farm
- Discuss pros and cons for this system, with suggestions for mitigating potential negatives
- With the intention of using this information to educate visitors, provide ideas on the how use of irrigation systems can help Minnesota contribute to "feeding the world." Also consider how this use will impact Minnesota's citizens/consumers (think natural resources, food availability, food cost, Minnesota's economy, etc.)

Resources

Types of Irrigation Systems - Centers for Disease Control and Prevention

<https://www.cdc.gov/healthywater/other/agricultural/types.html>

The Secretary of the Interior's Standards for the Treatment of Historic Properties + Guidelines for the Treatment of Cultural Landscapes

<https://www.nps.gov/tps/standards/four-treatments/landscape-guidelines/index.htm>

Soil type influences irrigation strategy - Michigan State University

http://www.canr.msu.edu/news/soil_type_influences_irrigation_strategy

Soil survey of Sherburne County, MN

https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/minnesota/MN141/0/sherb_MN.pdf

“Getting water to crops when they're thirstiest pays off” - MPR News

<https://www.mprnews.org/story/2014/10/02/ground-level-beneath-the-surface-otter-tail-irrigation>

Beneath the Surface: Minnesota’s Pending Groundwater Challenge - MPR News

<http://minnesota.publicradio.org/projects/2014/01/ground-level-beneath-the-surface/>

“A better way to water crops” - Farm Horizons

<http://www.herald-journal.com/farmhorizons/2016-farm/better-irrigation.html>

“Technology developments improve irrigation efficiency” - The Land

https://www.thelandonline.com/news/technology-developments-improve-irrigation-efficiency/article_ccb113c2-f74f-11e5-849a-cfd007b0df.html

Lightning round talk from Josh Stamper, from the Department of Soil, Water, and Climate at the University of Minnesota

<https://www.youtube.com/watch?v=l8VFgye89xs>

National Climate Assessment

<https://nca2014.globalchange.gov/report>

THE OLIVER KELLY FARM 2018

