**SCENARIO**

**BACKGROUND:**

You are the land manager for a 1280-acre row-crop, cow operation in Nebraska. Your major crops include a corn and soybean rotation with cattle taken in annually during non-growing season on a cash-rent basis. With current market conditions and considering last year’s net revenue, it is anticipated that the farm will have major difficulty and may not be able to find capital such as operating loans to continue operating beyond the next two years without significant changes. The farm consists only of essential family personnel and equipment (in good shape) that is paid for. There are no savings to be had in reductions of labor or equipment.

The farm is implementing conventional farming techniques, including tillage, and extensive use of synthetic fertilizers applied with sprayers. Irrigation consists of manually operated center pivots and gravity irrigation. Cattle are used to graze on corn stocks during the winter months. Only two crops are raised, 75% field corn and 25% soybeans.

The farm is using extensive inputs such as synthetic fertilizers due to poor soil condition. The farm has significant soil compaction due to many trips through the field with equipment and other farm practices. There is poor soil health, significantly reduced populations of beneficial microbes and low organic matter content. The farm has a stream running through ½ mile of a field. This stream is seeing high levels of runoff and erosion sediment as well as high levels of fertilizers and pesticides in the runoff water. Wind erosion can also occur on this farm, causing excessive dust during the winter and early spring. The local Natural Resources District has sampled the water and determined that the Nitrate levels in the ground water under some fields exceed 20 ppm (parts per million); which is double the allowable federal drinking water standard.

**RESOURCE CONCERNS:**

This operation has the following resource concerns**:**

* High input costs, such as need for fertilizers, herbicides and pesticides.
* High cost for fuel or electricity for irrigation.
* Poor soil health, including microbes and organic matter.
* High soil compaction
* Less than optimal forage potential (lost grazing value)
* Erosion due to runoff and wind erosion.
* Reduced water quality through leaching of agriculture fertilizers and chemicals.
* Reduced water quantity through irrigation inefficiency.

**STUDY/PLANNING OBJECTIVES:**

1. Explore the concept of soil health and how practices such as No-Till farming and Cover crops can impact soil health, water quality, and water quantity.
2. Explore the relevance and usefulness of new technologies in increasing farm efficiency and decreasing environmental impact such as Soil Moisture Sensors, Project Sense, and Subsurface Drip Irrigation.
3. Review the importance of existing best management practices such as Buffer Strips for controlling erosion, and improving water quality, and Wind breaks to reduce erosion and increase soil moisture.
4. Create an **Operating Plan** to address these issues which your team will present. You will have the specified amount of time to complete an oral presentation of this Operating Plan.
   1. Create and provide a “Background” summarizing the previous management activities and explain how these have led to the current Resource Concerns.
   2. Explain Agriculture Soil and Water Stewardship, its importance, and how this concept will be incorporated into the overall objective of this agriculture operation.
   3. In order to address **ALL** of the Resource Concerns, identify and explain relevant, specific **best management practices** which, when implemented will likely result in better agricultural soil and water stewardship.
   4. Summarize the importance of partnerships, with research institutions, conservation agencies, and grant funding in pursuing the implementation of new technologies and procedures.
5. Summarize your plan to include the desired future economic and environmental conditions and outcomes of successful stewardship on this farm.

**RESOURCES (not limited to this list):**

**Soil Conservation:**

NRCS:

<https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_063808.pdf>

<https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ia/newsroom/releases/?cid=nrcs142p2_011847>

<https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/home/?cid=nrcs143_023568>

<http://cropwatch.unl.edu/farmresearch/articlearchives/introducing-project-sense>

Fairfax Co. Va:

<http://www.fairfaxcounty.gov/nvswcd/newsletter/notill.htm>

Nebraska Forest Service

<http://nfs.unl.edu/documents/windbreakdesign.pdf>

Natural Resources District:

<http://www.cpnrd.org>

**Soil Health:**

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/soils/health/>

<https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/climatechange/?cid=stelprdb1077238>

Soil Food Web:

<http://www.soilfoodweb.com.au/index.php?option=com_content&view=article&id=85&Itemid=117>

National Geographic:

<http://news.nationalgeographic.com/news/2014/09/140918-soil-bacteria-microbe-farming-technology-ngfood/>

**Water Conservation:**

University Nebraska Lincoln

<http://water.unl.edu/crops/nitrogen>

<http://water.unl.edu/crops/soil>

<http://water.unl.edu/cropswater/nawmn>

Nebraska Department of Agriculture

<http://www.nda.nebraska.gov/pesticide/buffer_strip.html>

Environmental Protection Agency

<https://www3.epa.gov/region9/water/drinking/files/dwshat-v09.pdf>

<https://www3.epa.gov/watersense/outdoor/tech.html>

Successful Farming @ Agriculture.com

<http://www.agriculture.com/crops/where-drip-irrigation-fits-in_135-ar13146>

<http://www.agriculture.com/machinery/precision-agriculture/soilmoisture-senss_234-ar42409>

CCOF Foundation

<https://www.ccof.org/blog/balancing-soil-fertility-equation-five-ways-reduce-nitrogen-leaching>

**Special Topics Rules and Regulations**

**(Found in the Nebraska Envirothon Policy Manual page 8)**

**8.3** The seventh station will require each team to address question concerning a special issue each year based on

the special issued determined by the Canon Envirothon Steering Committee. The oral presentation will:

**8.3a.** Be at least 8 minutes minimum and no more than 10 minutes in length. or over 10 minutes. Points will be

deducted for presentations under 8 minutes.

**8.3b.** Require participation of all five team members. Each team member contributes up to two points for

participating orally in the presentation.

**8.3c.** Require teams to present a natural resource remediation strategy for an actual(on the ground) or

hypothetical natural resources issue.

**8.3d.** Following the presentation there will be a question and answer period for the judges.

**8.3e.** Only visual materials allowed are posters. There is no limit to the number of posters a team is able to use.

There will be an easel provide for teams to use. Note cards are allowed during the presentation. All visual

materials and note cards must be turned in at registration. Materials will be made available immediately prior to

presentation.