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Farm Example Land Walk Report

Agroecologist: Luke Robert Gran

Land Walk Date: December 22, 2015
Report: January 12, 2016

Client(s): John and Jane Doe
Phone(s): (515) 975-6139

Contact Person: John Doe
Email(s): Email

Home Address: Address

County: County

Summary

Diverse farmer John Doe has made a tremendous impact on Iowa by following his passion to stop dust storms of soil erosion he remembers as a child. His journey as a farmer has spanned an incredible period in history, from the end of the commonplace sighting of the moldboard plow to no-till and genetically modified crops. The Doe Farms' mission statement is, "To produce abundant crops while saving precious topsoil," but John is exploring how he might incorporate "improving water quality" into that mission. Doe Farms is located in the Des Moines Lobe geological formation, where ponding in former prairie/wetland soils causes some ground to be unprofitable for annual row crops in most years.

There are diverse opportunities available to address the goals of Doe Farms. These include adding field complexity and enterprise diversity to bring the next generation of the family into the farm, reconstructing native prairie and/or wetlands to improve water quality, adding perennial vegetation field borders and installing "saturated buffers" in these perennial zones to filter nitrate leaving tile lines. Another practice proven to improve yield, soil conservation, wildlife habitat, and aesthetic value are field windbreaks, also called shelterbelts. Finally, continuing to improve soil quality with more aggressive cover cropping, maintaining a small grain crop in the rotation, and enhancing the farmstead windbreak for another 100 years of good farming and living on the plains of north central part of County County.

CLIENT GOALS (Based on emails and site visits with John and Jane.)

1. *Recover value of crop losses in prairie potholes by converting production to ecosystem services (conservation water storage, water quality improvement, habitat enhancement) that may qualify for government funding programs. Improve the quality of water leaving the farm, without compromising profitability.*
2. *Increase wildlife habitat on the farm, including expansion and improvement of the farmstead windbreak.*
3. *Improve soil quality and soil health, and reduce soil erosion.*
4. *Keep the land in the family.*

GOAL-ORIENTED RECOMMENDATIONS

1. Improve water quality leaving the farm, without compromising profitability.
    1.1. Government programs
        1.1.1. Convert field ponds that flood frequently to diverse prairie pollinator habitat.
        1.1.2. Reconstruct a small wetland with a prairie buffer all the way around it. The NRCS is an excellent resource for long-term funding and design.
        1.1.3. Install a “Quail Buffer” 30-60’ wide around the farm, consisting of diverse native wildflowers and grasses. Consider alternately planting a diverse field windbreak/shelterbelts on the farm (part of a CRP program), to increase yields by 10-20%, while benefiting wildlife, and conserving the soil.
        1.1.4. Filter the tile water leaving your farm by installing, within the “Quail Buffer”, a “Saturated Buffer” with a control box.
    1.2. Farm business changes
        1.2.1. Get more aggressive with your cover crop system. Don’t let two months of growth pass you by—when the weather patterns are appropriate, consider seeding cover crops in late August. Try pilots from Storm Flying Service out of Webster City or Iowa Cover Crops out of Grand Junction, Iowa. Another promising option, though less proven, is to interseed cover crops in the corn crop at the V6 stage.
        1.2.2. Increase the diversity of your cover crop mix to get balanced fall and spring growth. Species to try: yellow mustard, rapeseed, oats, and barley, sown along with cereal rye.
2. Increase wildlife habitat on the farm, including expansion and improvement of the farmstead windbreak.

2.1. Farmstead windbreak cost-share assistance with annual CRP rental rate programs are available. 125 feet width would provide you enough space to have a premium windbreak with diverse conifer, deciduous trees, and shrubs or prairie.

3. Improve soil quality and soil health, and reduce soil erosion.
   3.1. Grazing livestock could improve soil health by enhancing the diet of the biology in your soil. This would also create an opportunity to incorporate a diverse, 8-12 species summer cover crop into your rotation. Consider leasing your land, post-harvest, to a neighbor with livestock, or bring a family member back to the farm for enterprise diversification. A six-species forage mixture of grasses and legumes for hay would be amenable to incorporating livestock into your stripfarming system.
   3.2. Field windbreaks/shelterbelts are an effective practice for reducing wind erosion on your farm, while also increasing yields, as also noted in section 1.1.3.
   3.3. Your practices are already excellent, though consider adding diversity to your cover crops, and seeding them earlier, either by flying them on in late August, or interseeding at V6 stage in corn.
4. Keep the land in the family.
   4.1. New enterprises for increased income generation and broader family involvement.
      4.1.1. Enterprises could include Chinese chestnuts, incorporating livestock, agri-tourism, and leased hunting to native ecosystem areas (prairie potholes).
      4.1.2. If not already doing so, begin facilitating regular family farm meetings, to establish rapport for a successful transition.

I look forward to assisting you further as needed with the implementation of these farm enhancements.

Best Wishes,

Luke Robert Gran
Forester, Owner

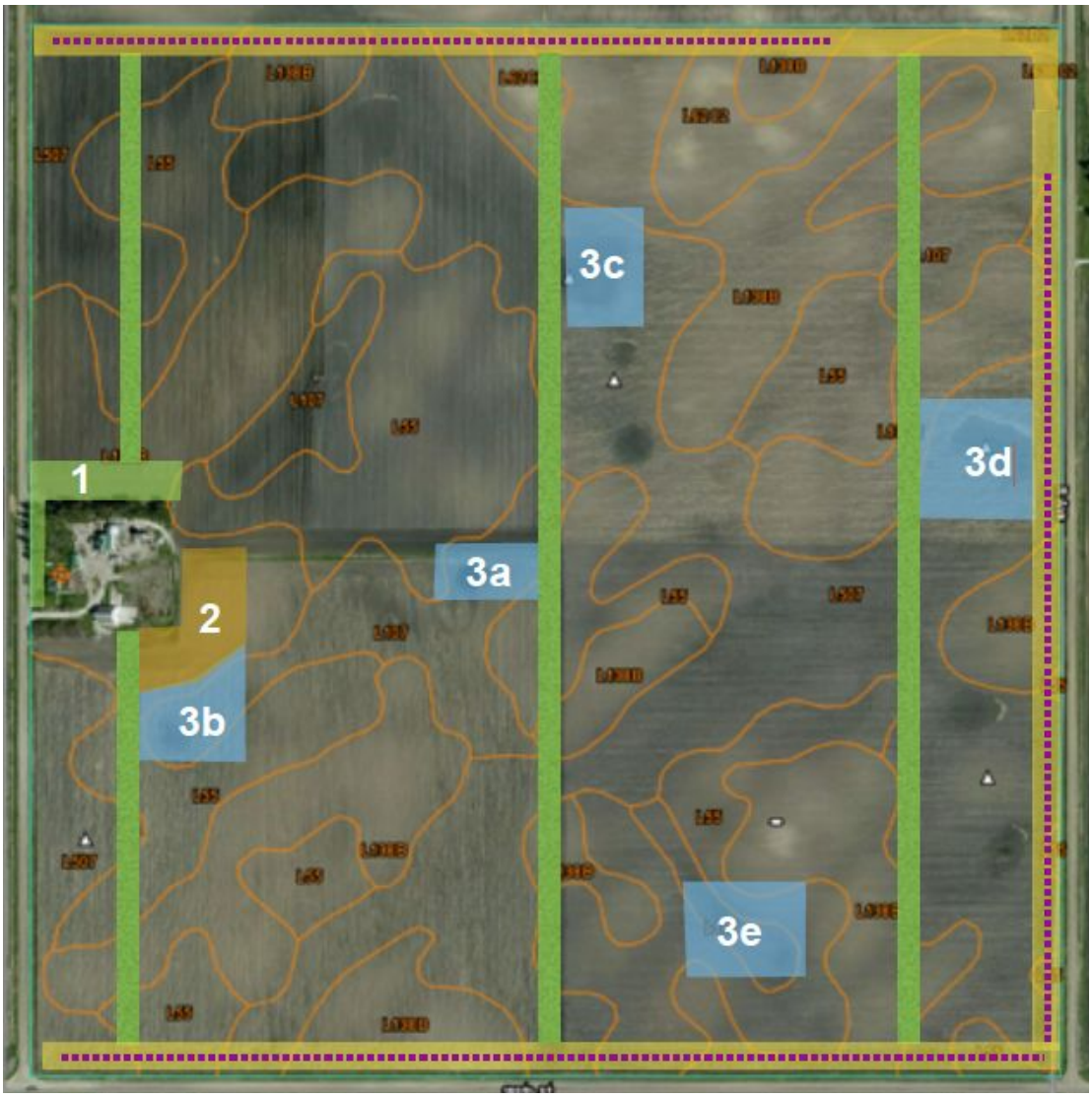
Recommended Trees and Shrubs for your Farmstead Windbreak

Shrubs and Trees listed are well-suited to Clarion soils

Note: dark gray color fill indicates that the selected species tolerates shade

Hardwoods	Conifers	Shrubs
Basswood	Canaan fir	American plum
Black cherry	Eastern red cedar	Aronia berry
Black oak	Eastern white pine	Arrowwood
Bur oak	Norway spruce	Bladdernut
Black or Sugar maple	White spruce	Buttonbush
Chinkapin oak		Choke cherry
Cottonwood		Crabapple
Hackberry		Eastern redbud
Kentucky coffee tree		Elderberry
Northern pecan		Gray dogwood
Red oak		Gooseberry
Shagbark hickory		Hophornbeam
Swamp white oak		Hawthorn
Silver maple		Hazelnut
Walnut		Nanking cherry
White oak		Nannyberry
		Ninebark
		Paw paw
		Redosier Dogwood
		Serviceberry

New Vision Land Management Map



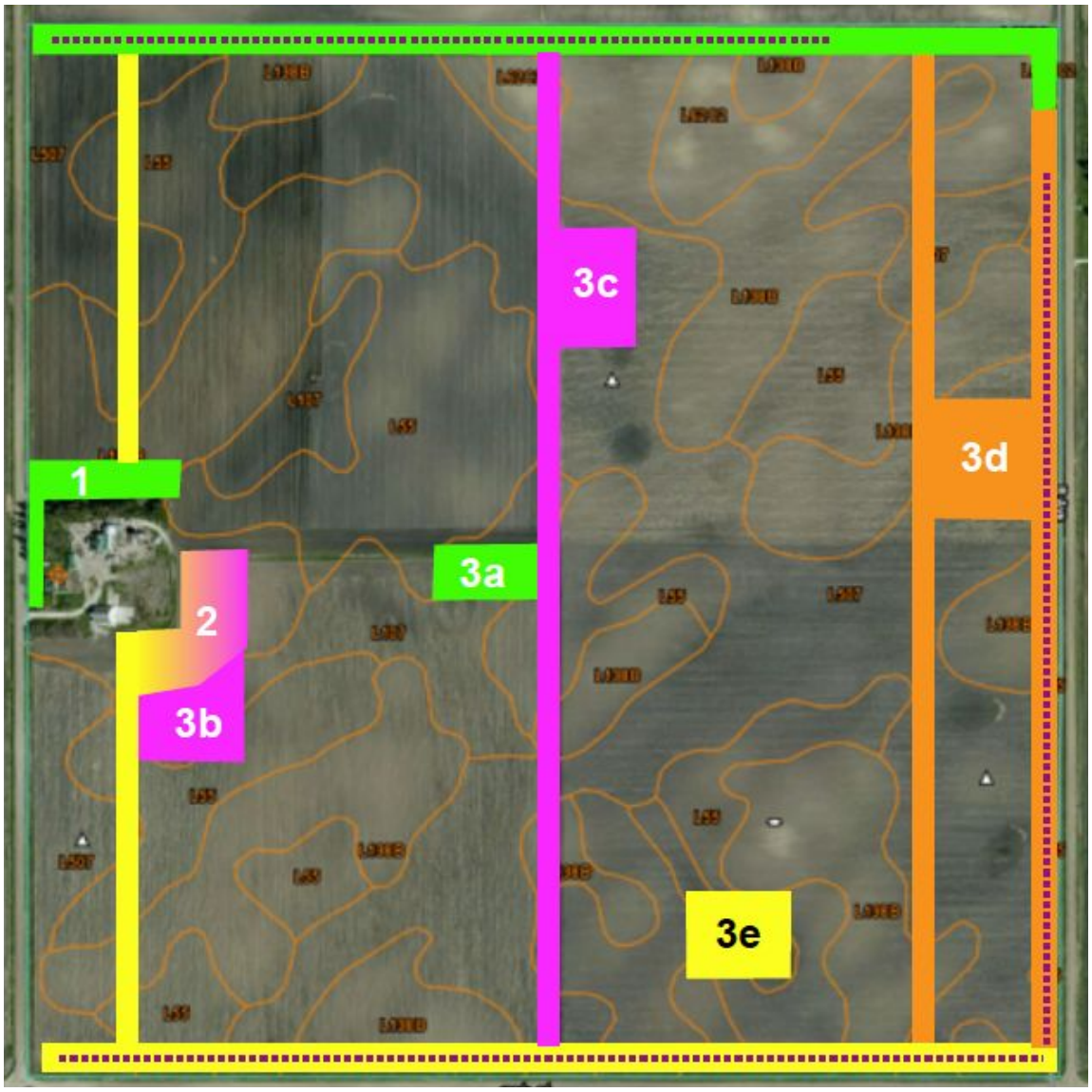
Zone	Management Action
1	Farmstead windbreak
2	High value tree crops orchard
3	Reconstructed prairie wetland possibilities

Field Windbreak

Perennial Field Buffer

Saturated Buffer

Proposed Implementation in Four Phases

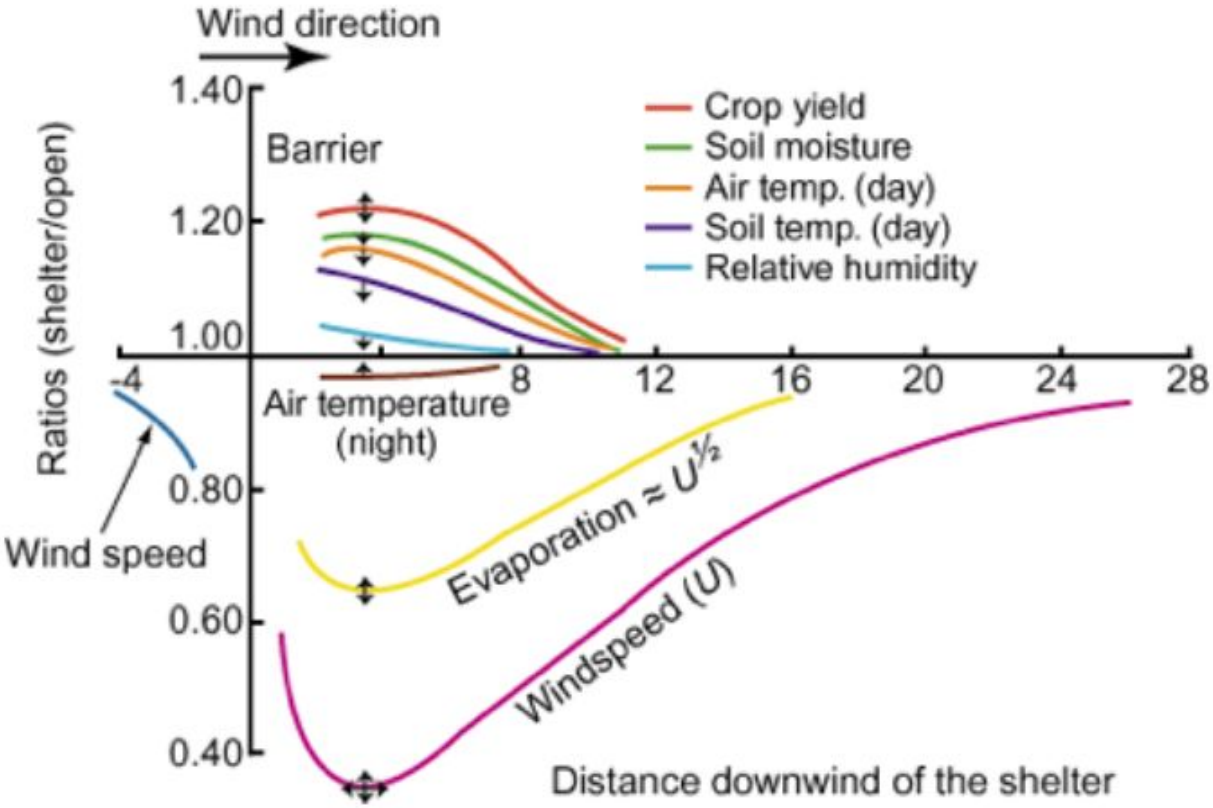


Phase	Color	Management Actions
1		Farmstead windbreak; pothole 3a; north field buffer, NE prairie knob
2		West field windbreak, 1 acre chestnuts, pothole 3e, south buffer
3		1 acre chestnuts, central field windbreak, pothole 3c
4		1 acre chestnuts, east field windbreak, pothole 3d, east buffer

Yield Increases due to Field Windbreak

Other management publications can be found at: http://nac.unl.edu/ publications/morepublications.htm and http://www.aftaweb.org/about/what-is-agroforestry/windbreaks.html Graphic below is from http://

agron-www.agron.iastate.edu/courses/Agron541/classes/541/lesson05a/5a.5.html



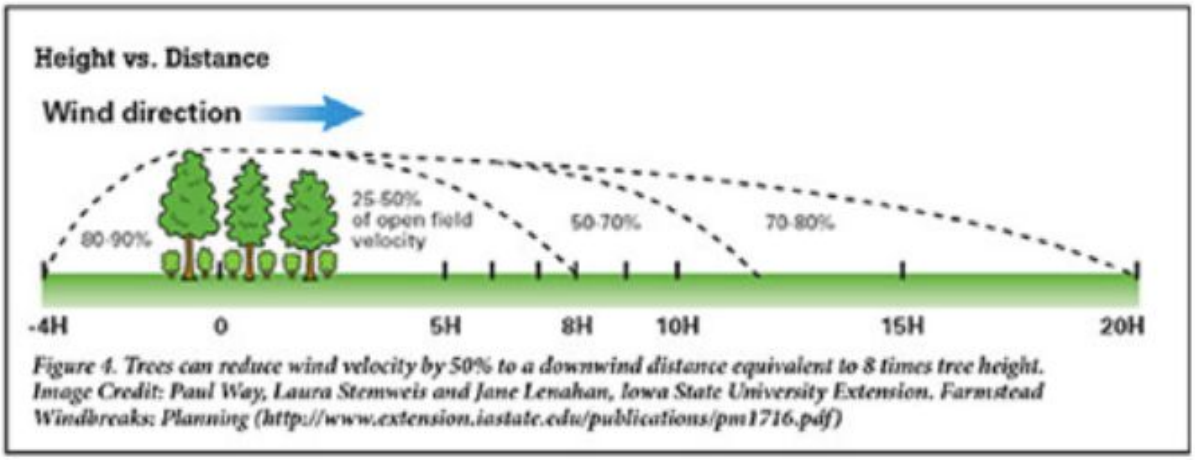
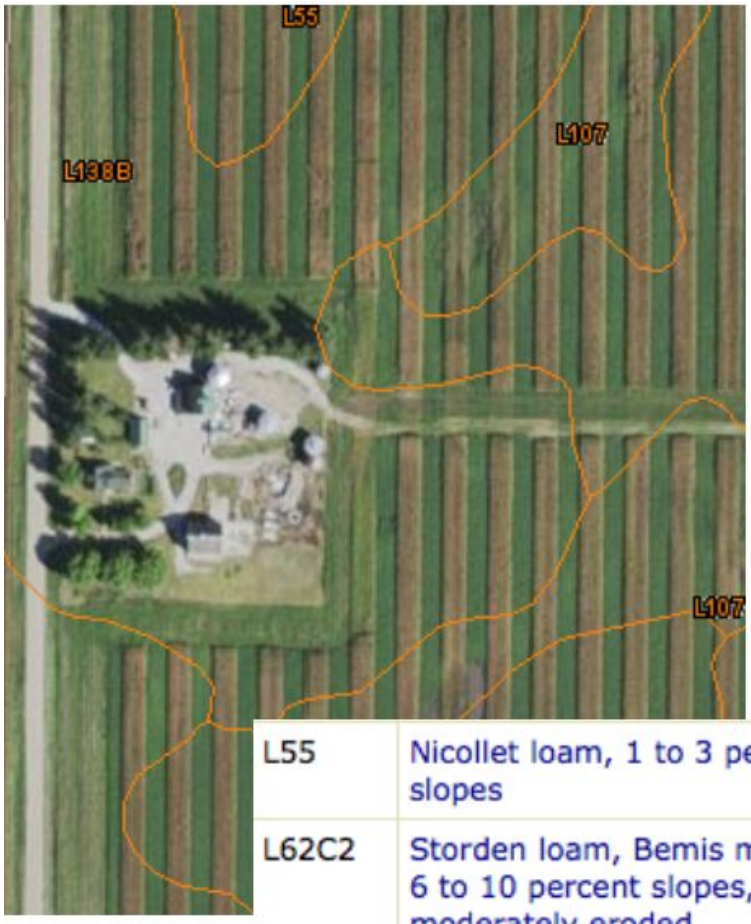


Figure 4. Trees can reduce wind velocity by 50% to a downwind distance equivalent to 8 times tree height. Image Credit: Paul Way, Laura Stemweis and Jane Lenahan, Iowa State University Extension. Farmstead Windbreaks: Planning (http://www.extension.iastate.edu/publications/pm1716.pdf)

Farmstead Property and Soil Map

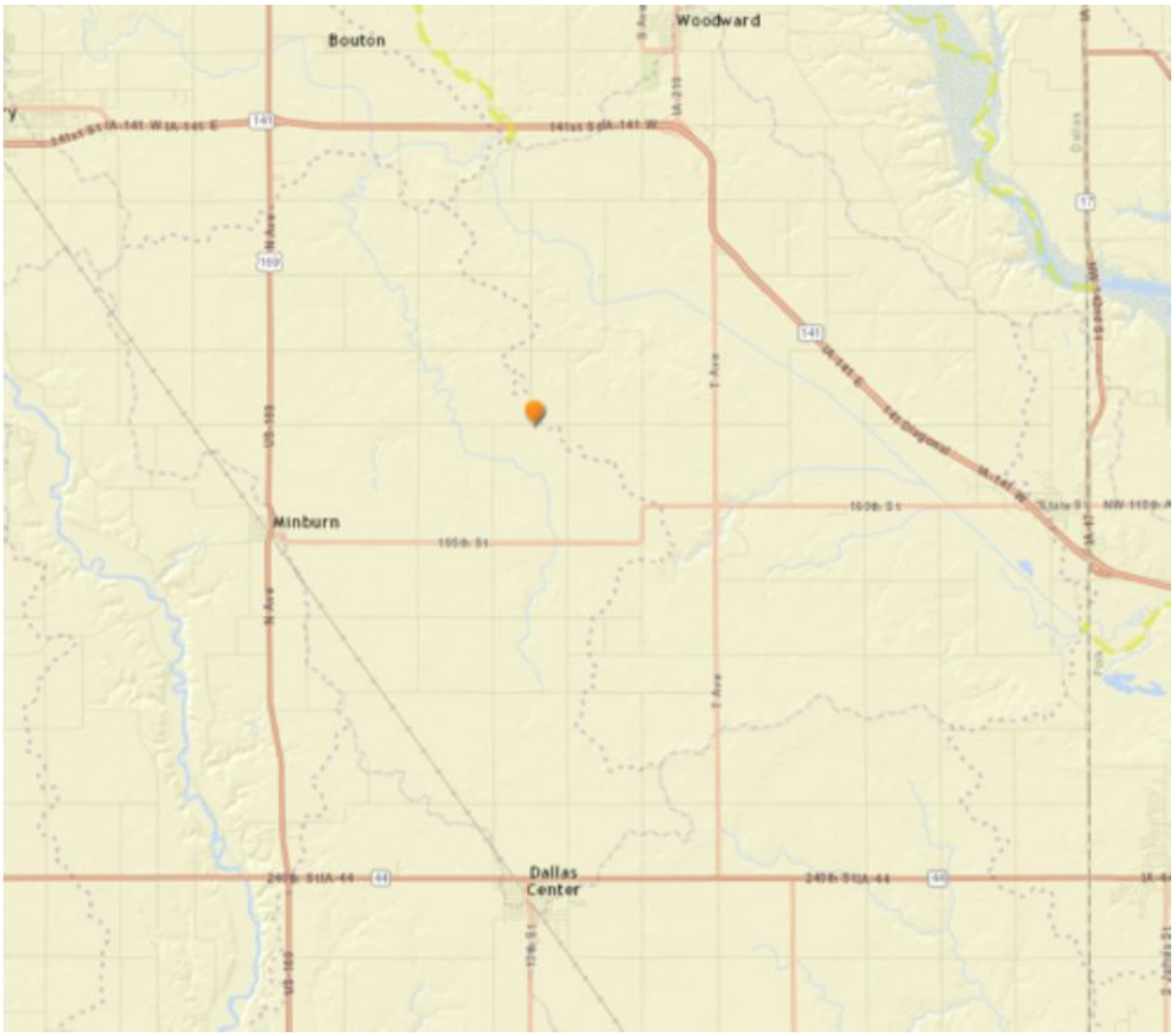


L55	Nicollet loam, 1 to 3 percent slopes	37.3
L62C2	Storden loam, Bemis moraine, 6 to 10 percent slopes, moderately eroded	4.3
L62D2	Storden loam, Bemis moraine, 10 to 16 percent slopes, moderately eroded	0.2
L107	Webster clay loam, Bemis moraine, 0 to 2 percent slopes	12.6
L138B	Clarion loam, Bemis moraine, 2 to 6 percent slopes	55.3
L507	Canisteo clay loam, Bemis moraine, 0 to 2 percent slopes	47.6

Watershed Maps

Rain that falls on the east 2/3 of the farm flows into Beaver Creek (moves southeast), and the western 1/3 flows into Slough Creek (flows to the southwest). Beaver Creek Watershed concludes south of the intersection of Hwy 17 and 141. This stream is listed by the Department of Natural Resources (DNR) as an “Impaired Waterbody” one of more than 700 federally listed as such with the Environmental Protection Agency (EPA). Slough Creek Watershed eventually empties into the Raccoon River which is a primary water source for the City of Des Moines, Iowa.

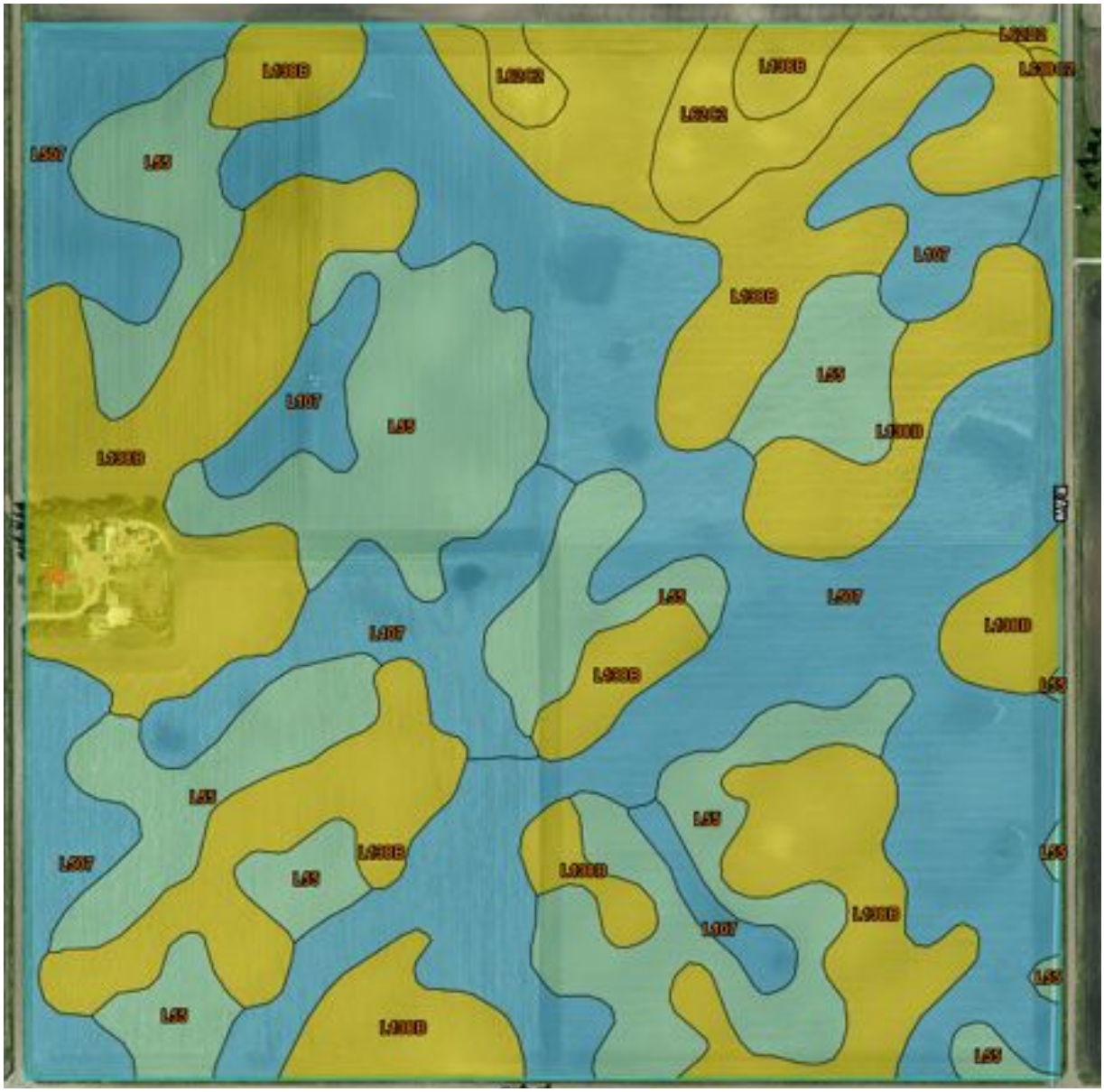
“Subwatershed" Scale Hydrologic Unit Code 12 (HUC12)



Soils Map

Map Unit Symbol	Map Unit Name	Acres in AOI
L55	Nicollet loam, 1 to 3 percent slopes	37.3
L62C2	Storden loam, Bemis moraine, 6 to 10 percent slopes, moderately eroded	4.3
L62D2	Storden loam, Bemis moraine, 10 to 16 percent slopes, moderately eroded	0.2
L107	Webster clay loam, Bemis moraine, 0 to 2 percent slopes	12.6
L138B	Clarion loam, Bemis moraine, 2 to 6 percent slopes	55.3
L507	Canisteo clay loam, Bemis moraine, 0 to 2 percent slopes	47.6
L638C2	Clarion-Storden complex, Bemis moraine, 6 to 10 percent slopes, moderately eroded	0.1
Totals for Area of Interest		**157.4**

Soil Drainage Class Map areas in blue are poorly drained, green are moderately well drained, areas in yellow are well drained



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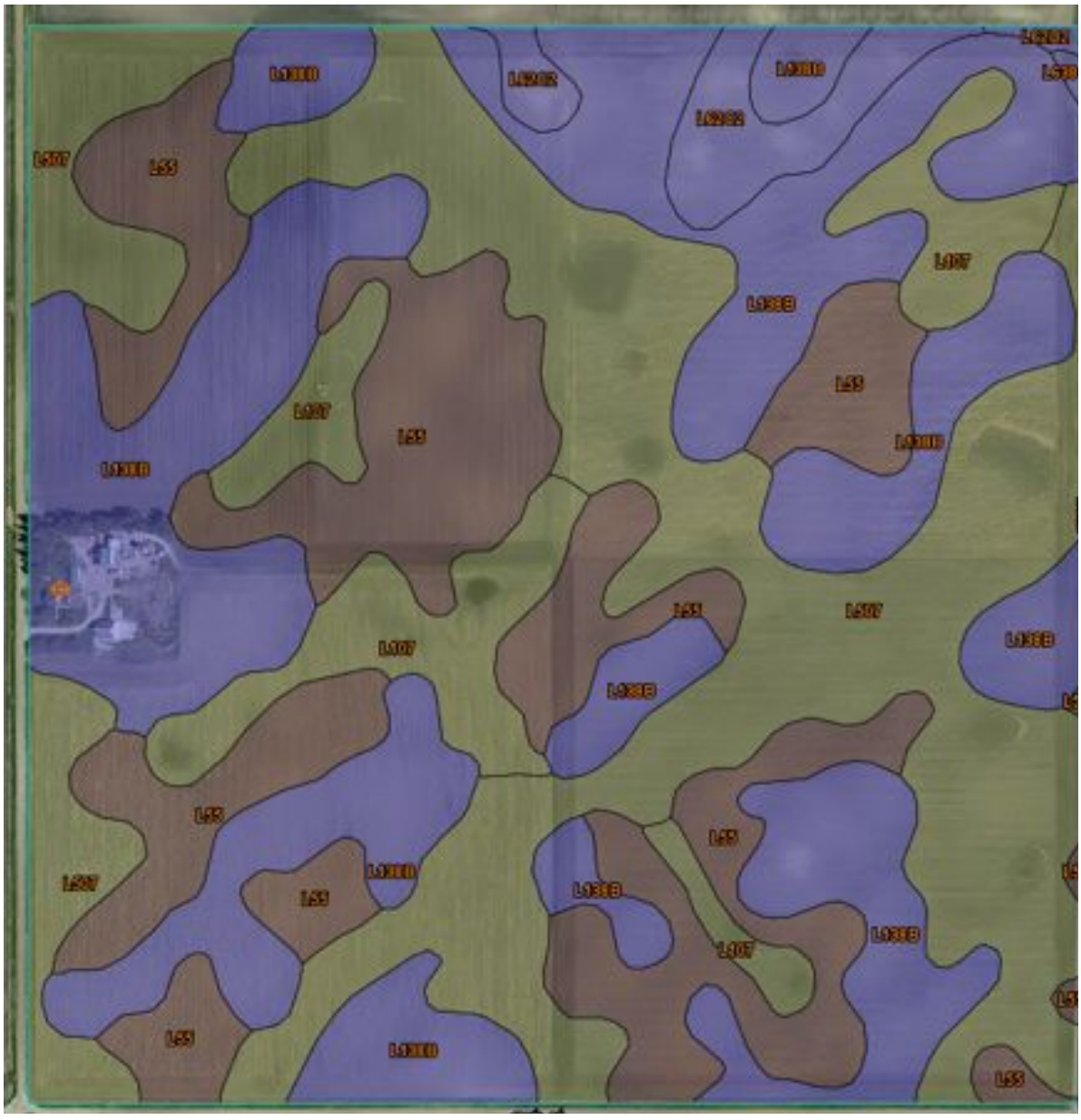
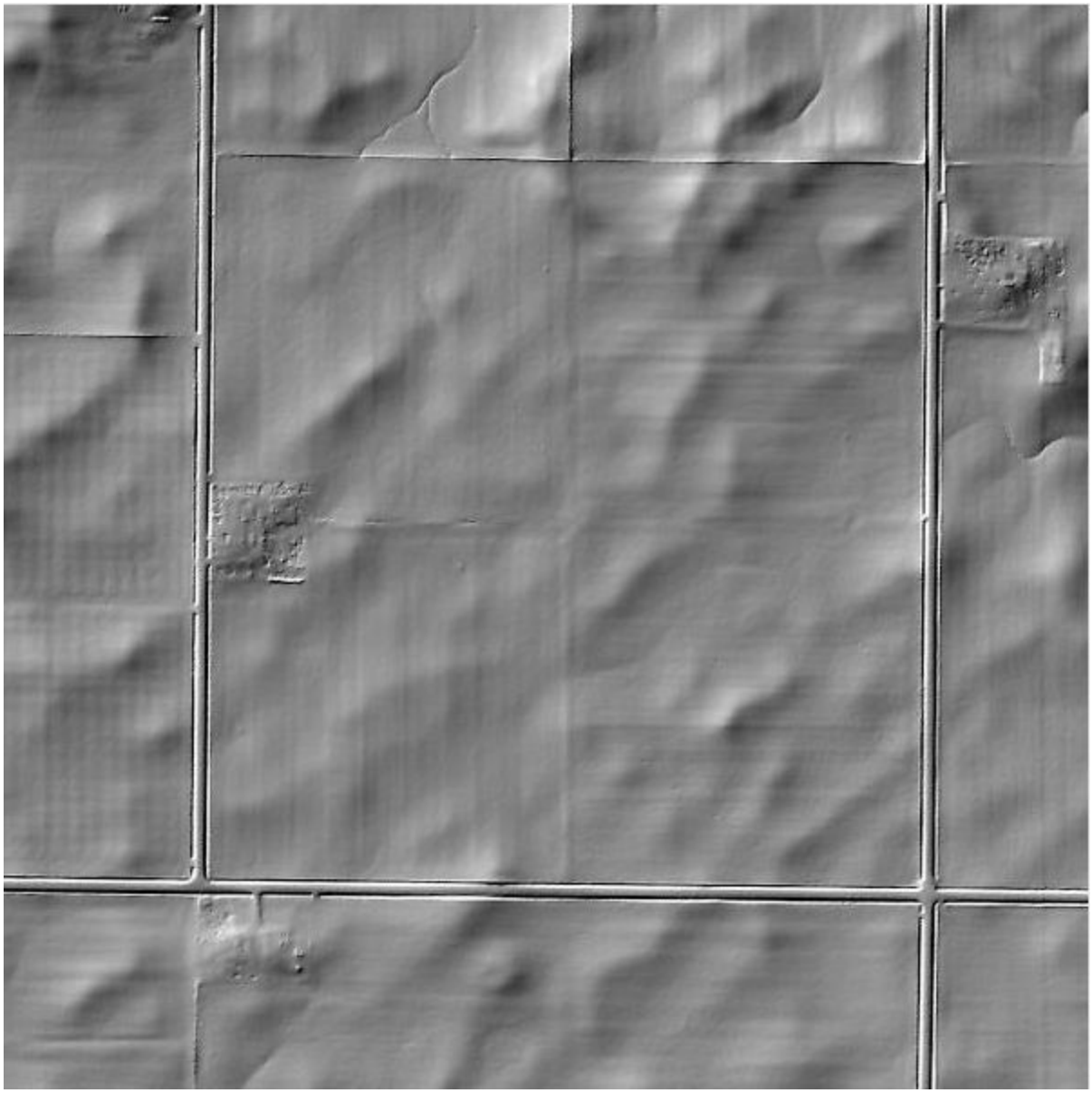
Hydrologic Group Soils Map rates the soil runoff potential of the soils on your farm. “A” is low, “D” is high. “A/D” means the soil was naturally “D” but was improved to “A” with subsurface drainage. Almost all (94%) of your farm is rated “C/D” showing that your soils are naturally limited in their ability to be improved with tile drainage and soil run-off will occur.



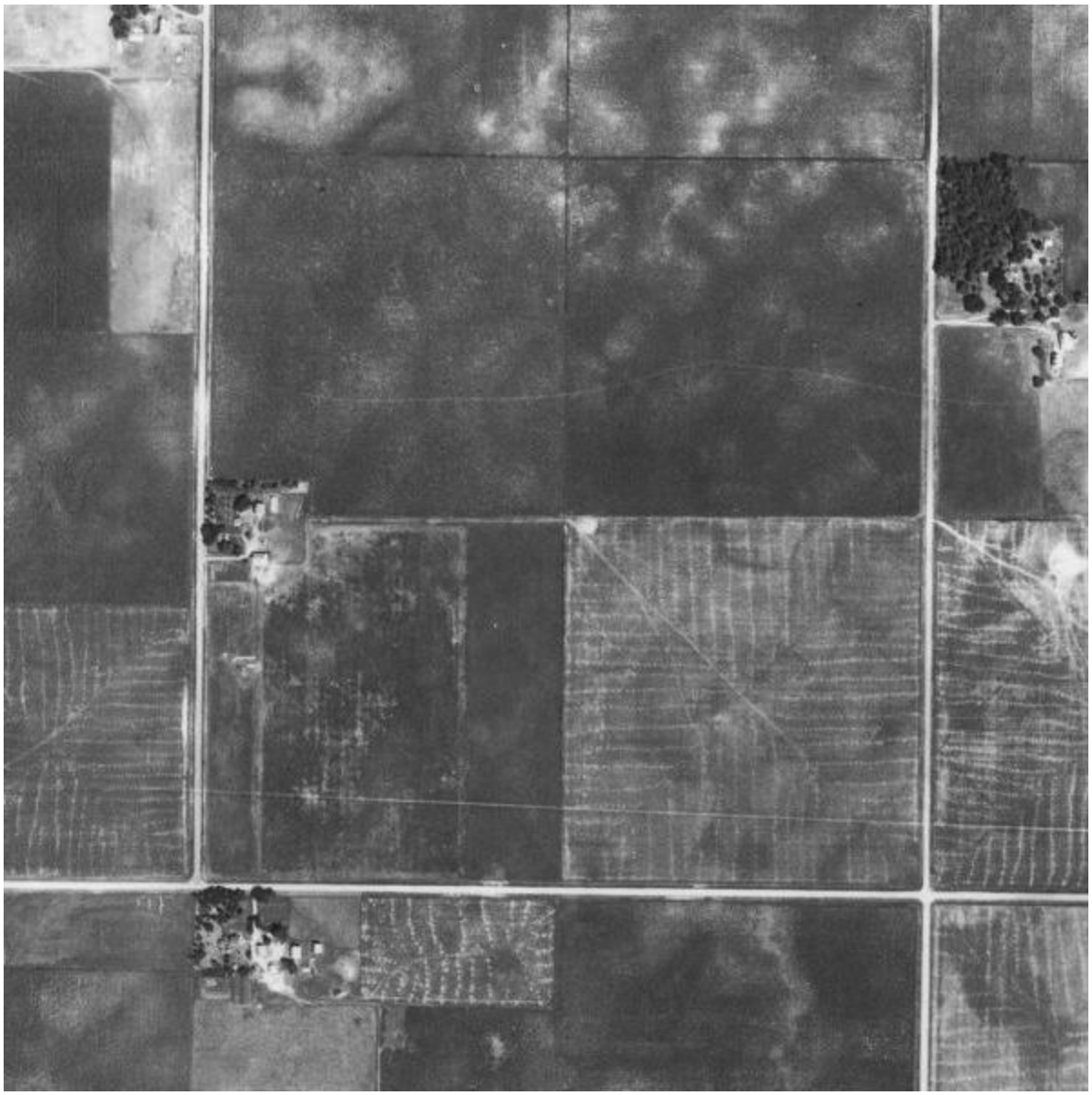
Light Image Detection and Range (LiDAR) relief map of the terrain in the neighborhood



2014 aerial photograph

Aerial photograph in 2007-2010

1930s aerial photograph



Historic Vegetation Map. In the 1830s-1840s all the farm was prairie and wetlands