

Interior Alaska Hay Field Renovation Project

Exploring methods for improving soil health and hay production in compacted hay fields

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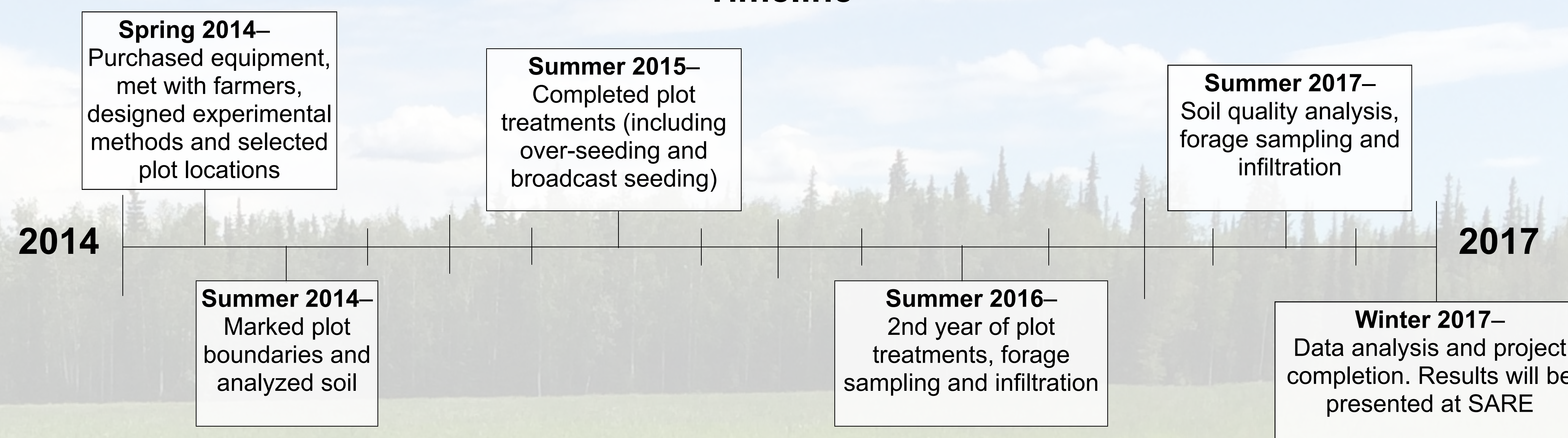
Introduction

In Alaska, the high cost of renovating pasture and hay fields and the short season result in fields that remain in continuous hay production for many years. Some fields have been in production without renovation for over 30 years. Fields are severely compacted causing environmental concerns, rooting depths are shallow, and surface applied fertilizer is often lost to volatilization and runoff. Yields and profitability are negatively impacted, soil health is poor, and biologic activity is reduced.

This project is unique in comparing three options to complete renovation of fields without the high costs of fuel, labor, and indirect costs including loss of income. Seasons are very short and standard hay renovation including disking, plowing, and planting could take up to three years. Previous research and testing using soil aeration was disappointing. No statistical difference was measured between controls and mechanically aerated plots.

This demonstration project will investigate the effectiveness of utilizing mechanical over-seeding that slightly discs and then seeds new grass in older hay fields and also use a cover crop (forage radishes) to break up soil compaction and improve soil health. Three local farmers are participating in the demonstration project and have kindly donated their time and equipment to completing the work. This will be a four year project and final results will be shared at the Alaska SARE Conference.

Timeline



Methods

Three farms were selected to participate in this study based on their location, the condition of the hay fields, and the farmer's willingness to participate:

1. Eielson Ag
2. Two Rivers
3. Nenana

A randomized complete block design was used, with three blocks containing five treatment plots each per farm. Treatments include:

1. Control
2. Over-seeding with brome hay seed
3. Over-seeding with forage radish seed
4. Over-seeding with forage radish seed two years in a row
5. Spraying the grass and weeds with Cornerstone and then broadcast seeding forage radishes

Year 1

• Soil quality analyses were performed in each block of treatment plots to get a baseline measure of soil health

Year 2

• Treatments were carried out with assistance from participating farmers and a certified crop advisor

Year 3

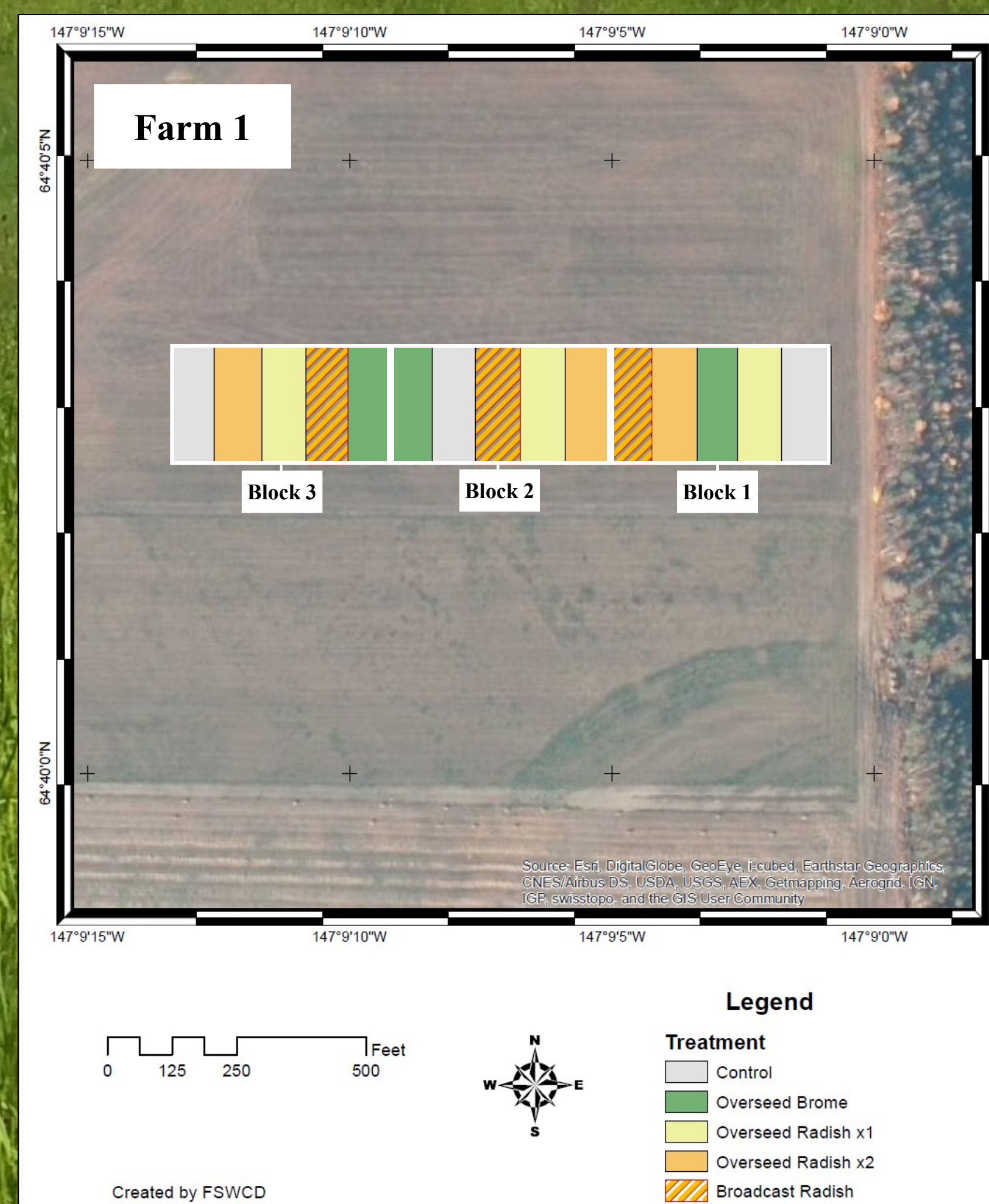
• The final plot treatments will be conducted (including the second year of over-seeding with forage radishes, and seeding brome hay in the "broadcast radish" plots)

• Forage sampling will be done to evaluate the difference in hay production and nutrient content for the various treatments

Year 4

• Soil quality analyses, forage sampling, and infiltration measurements will be performed in each treatment plot

Right: Maps of the treatment plots layout at each of the three farms. Blocks were located with consideration to changes in soil, hay production levels, compaction levels, etc. as well as farmer convenience.



Tillage (Forage) Radishes

Radishes are a commonly used cover crop elsewhere in the United States. In Alaska, trials have been done in Delta Junction with mixed success. The radishes grew well in Delta but the moose and bison ate most of them! This type of radish has been proven to reduce compaction and improve soil health. The radish roots penetrate compaction layers, improve drainage and air movement, and soak up nutrients—releasing them in the spring when plants need it most. Studies at the University of Maryland showed an increase in soybean and corn yield in heavily compacted soils with the use of the Tillage Radish as a cover crop.

The images to the right show radishes in our treatment plots at various stages of growth (up to several weeks after germination).

For more information, go to CoverCropSolutions.com.

Equipment

The over-seeder used for this project is a 15-72 Landpride "Solid Stand Seeder". Fairbanks Soil & Water Conservation District also purchased a small broadcast spreader that pulls behind a four-wheeler for spreading radish seed and fertilizer.



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