For more information, contact your local NRCS, SWCD or MN Extension Office at:

A number of years ago, Mike and Jason Helstrom began to realize that conventional livestock production was not as profitable as they wished. They began to look at ways to reduce inputs and improve forage production. They experimented with high stock density grazing, long rest periods and mature forage grazing—all of which improved overall forage health, vigor and diversity, and production. Mike and Jason also noticed that nutrient cycling improved and their winter feed needs were reduced by the ability to graze longer. The Helstroms liked what they saw, and began to outwinter livestock on pasture and incorporate annual forages into a pasture rotation which enhanced their system even more.

Mike states: “Managing pastures with soil health in mind has resulted in a 200% increase in grazing days per acre over the last 5 years. Improving soil health is key to more profitability and quality of life in a cow/calf operation.”

**Pasture and Hayland Soil Health: A Roadmap**

As managers, it’s easy to focus on managing the above ground production in our pastures and hayland while paying little attention to what happens below ground. However, we need to remember that a healthy and productive forage stand is dependent upon healthy and productive soils.

Here you will find some basic information to help you along the road to soil health. These are management practices and concepts that may or may not work for your farm. Experiment and find out what works best for you. Keep in mind that there is no “magic bullet” and the process can be slow, but stick with it and you’ll likely see results.

**Basic Soil Health Principles**

1. **Armor the Soil** - keep the soil covered with forage residue, living or dead. Bare ground or sparse ground cover results in high soil temperatures and moisture loss.

2. **Minimize Soil Disturbance** - physical disturbance such as tillage or overgrazing on wet soils can disrupt soil function. Avoid regular and unnecessary disturbance.

3. **Increase Plant Diversity** - increase the number and type of species in your pasture or hayfield to foster soil biological diversity.

4. **Keep living roots in the ground** - living roots provide a food source for soil micro-organisms. Incorporating annual forages/cover crops can lengthen the growing season.

**Practices to Implement to Address Soil Health Concerns**

- Prescribed Grazing/Deferred Grazing
- Cover Crop
- Pasture and Hayland Planting
- Livestock Outwintering
- Nutrient Management
- Hayland/Pasture Rotation

**Local Success Story:**

**Helstrom Farms—St Louis County**

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**High Stock Density Grazing (Mob Grazing)**
Reduce pasture size to the point where livestock consume about half the available forage and trample the other half on a daily basis. Move livestock at least daily. Use temporary fencing to subdivide pastures. Target stock densities are generally at least 100,000 pounds per acre. Forages should be mature or close to it and grazing will only take place on any given location about 2 times per year.

**Incorporating Annuals/Cover Crops/Pasture and Hay Seeding**
If species diversity is low, perennial species can be no-tilled into the stand in various ways. Annual forages can also be added to existing stands for supplemental forage and diversity or soil building, or full season annual forage seedings can be used as part of a hay/pasture rotation.

**Livestock Outwintering**
Feeding livestock on pasture or hayland during the winter can be an excellent way to improve soil fertility. Be sure to avoid outwintering on steep slopes or near surface water or wetlands. Move livestock to an area that can handle damage during spring breakup. Allow areas that have been wintered extended rest (up to 1 year) prior to haying or grazing. Choose a different Outwintering location each year. Control weeds as needed.

**Nutrient Management**
Take a soil test on your pasture and hayland and add soil amendments such as lime, ash, commercial fertilizers, compost, or manure as necessary to improve fertility. Calibrate any spreading equipment and analyze nutrient sources so you can know the rate of application.

**Hayland/Pasture Rotation**
Changing up harvest and traffic timing and method can be beneficial. Consider using pasture and hayland interchangeably. During different years or different times of the year, graze your hayfields or harvest hay off your pastures if possible. This can help diversity and improve nutrient cycling on the farm.