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Livestock Pastures, Fencing and Watering on Small Acreages

Protecting Water Resources and Health

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Many small acreage livestock owners live within or close to high density residential areas. Unlike rural properties that are spacious and buffered by woodlands and fields, residential properties usually consist of smaller lots in close proximity to water resources such as ponds, streams, drinking water wells, storm drains and ditches. The amount of land per animal is typically very small, which often creates problems with manure storage, handling and utilization. As rain and snowmelt travel over the land surface and soak down into the groundwater, it can carry pollutants associated with livestock manure and related activities. These pollutants can harm nearby water resources including your own drinking water well or your neighbor's.

What are some solutions?

Some basic components of a sound livestock management program should include:

- Proper manure management – storage, handling and utilization
- Proper livestock yard management
- Proper pasture management
- Alternative watering sources -- limiting direct animal access to water resources (streams, ponds, wetlands, wells, etc.)

This fact sheet, the third in a series of 4, provides specific tips and resources for the proper management of pastures as well as fencing and watering techniques that eliminate direct animal access to water resources. Refer to fact sheet 2 *Livestock Yards and Manure Storage Areas on Small Acreages: Protecting Water Resources and Health* for specific tips and resources on those topics.

Pasture Management

When properly managed, a typical pasture in the Northeast consists of perennial cool season grasses,

legumes (such as white clover), and forbs (broadleaved plants such as chicory) that are nutritious and desirable to the grazing animals. They provide some or all of an animals forage requirements during the grazing season which typically occurs through the months of April to October. Pastures need to have rest periods during that time to allow for vegetative re-growth. Many livestock owners confuse pastures with livestock yards. A properly managed livestock yard is actually an important part of good pasture management, because it provides the animals with outdoor loafing and exercise when pastures are in need of rest and vegetative re-growth.

Pastures that are over-grazed and improperly managed can contain sparse vegetation, bare spots, and an abundance of undesirable weeds (such as thistle, milkweed, burdock, etc.) The desirable pasture plants will have a very low residue height (one inch or less) which weakens the roots and allows for the bare spots, weed invasions and increased surface runoff and soil erosion.

Depending on the type of animals grazed, the type of soils, and the condition of the pasture, one to two acres of properly managed pasture can support one average mature horse or cow during the grazing season. Under proper management, the desirable pasture vegetation is healthy and vigorous which reduces risks of soil erosion and surface runoff. This healthy vegetation also recycles the manure and nutrients being deposited, minimizing risks to surrounding water resources.

Direct animal access to water resources

Many small acreage livestock owners rely on streams or ponds to provide animals with easy access to drinking water. Allowing animals to graze right up to and/or access a water body or wetland will have

serious adverse impacts on water quality. Animals can trample vegetation along the shoreline, causing erosion, sedimentation and bank instability. The water body will receive direct surface runoff from surrounding areas and manure deposits, both of which are high in pollutants. Livestock may also have uncontrolled, regular access to the vicinity of a drinking water well due to limited space or poor planning.

Here are some pasture management tips:

- Generally, pasture vegetation should begin to be grazed at a height of 6 to 8 inches down to a residue height of 3 to 4 inches. Move the animals to allow for re-growth to the 6 to 8 inch height. These grazing heights optimize nutritional value and palatability for the animals as well as pasture re-growth and plant health.
- Adjustments to these grazing heights may be necessary depending on forage species and type of livestock. Sheep may do better to begin grazing at a height of 4 to 6 inches. Horses prefer to graze pastures that are taller and higher in fiber.
- Portable electric fencing options allow for the flexible subdivision of pastures into smaller paddocks to balance forage supply with forage demand for a given time period. Pasture paddocks should be sized as needed to provide the number of animals being grazed with anywhere from one to no more than seven days of grazing at a time.



Portable electraneet fencing provides these sheep with two full days of grazing at a time. Gilbert Stuart Road Demonstration Site, North Kingstown, RI.

- If you do have adequate pastureland, subdividing the area into paddocks that the animals graze for no more than seven days at a time is crucial for optimizing pasture productivity and health. Otherwise, animals will start to re-graze the tender new shoots that are trying to re-grow, leaving less desirable forage to head out and go to seed, slowing down its growth and becoming less nutritious. This can actually lead to a situation where some of the area is being over-grazed and some of the area is being under-grazed at the same time.
- If you have limited pastureland, the goal will be to reduce over-grazing and allow pasture vegetation to have periods of time when it can rest and re-grow. The pasture will not be a primary source of feed in this case. Allowing for some re-growth is especially important during hot, dry summer months when pasture recovery can take as much as 36 to 40 days or more, depending on rainfall, compared to a 14 to 20 day recovery time in May and early June. Consider splitting up the pasture into two or more paddocks that the animals can rotate between at least every two to four weeks. If this is not feasible, you may need to consider removing them from the pasture for a few weeks at a time and keeping them in a properly managed livestock yard, “sacrifice paddock” or the barn. You may also consider limiting the time they spend on the pasture to just a couple of hours each day.
- If you do have adequate pastureland, understand that you may have excess forage during the spring— you may have trouble keeping up with pasture growth depending on how many animals you have and whether you can mow some of the area for hay production.
- Contact the USDA Natural Resources Conservation Service for more information on rotational grazing systems.

Other pasture management tips:

- To promote uniform and vigorous growth, clip or mow pastures periodically (two or three times each season). This helps to stimulate new growth in areas that have grown tall and gone to seed.
- Scatter and disperse manure clumps by dragging pastures with a chain-link or flexible tine drag. This

reduces areas of rejected forage and helps to control parasites.

- Lime and fertilize pastures according to soil test results. Maintaining an optimum soil pH through liming is important for desirable cool-season grasses and legumes. Maintaining a stable nutrient balance in the soil is also important. Excess nutrients can cause animal health as well as water quality problems, so supplement with fertilizer only when a soil test indicates a nutrient deficiency.
- Through proper grazing and nutrient management, desirable forage species (cool-season grasses, legumes, forbs, etc.) tend to persist and dominate. Pastures can often be renovated without the need to plow up and reseed the area, but it may take a few years to achieve desired results. For more information on pasture forage species and pasture renovation techniques, contact the USDA Natural Resources Conservation Service. You may also wish to visit the Penn State Agronomy Fact sheet series website at www.agronomy.psu.edu/Extension/Facts/AgFacts.htm

What about fencing and watering?

Fencing and watering are key components to good pasture management and protecting water resources from direct animal access. To provide animals with clean drinking water and eliminate direct access to surface waters, portable watering troughs with automatic float valves are commonly used. The water may be piped to the trough through various pumping or gravity methods depending on the water source.

Here are some fencing and watering tips:

- Use secure permanent or semi-permanent fencing to protect streams, ponds and wetlands from animal access. Where possible, maintain a minimum 10 foot strip of vegetation between the fencing and water's edge.
- When using a stream or pond as a watering source, consider pumping the water to a holding tank or watering trough that is located within a pasture or livestock yard. Hydraulic ram pumps use the energy of flowing water (such as a stream) to lift water to an elevated storage tank or other discharge point. Nose-operated demand pumps use animal power

and may be an option for adult cattle in areas where low lifts of water are needed. Depending on the topography, a storage tank can be located at a high point on the property allowing for gravity feed to watering tubs.

- If livestock must access a stream for crossing, or when alternative watering options are not immediately feasible, consider fencing a vegetative buffer strip for the majority of the shoreline edge, and minimizing the livestock access area. The access area may need to be protected with crushed stone or other erosion control techniques. Check with all laws that may apply. The USDA Natural Resources Conservation Service has planning information on livestock access and crossings.
- Avoid allowing animals to graze or access areas within 100 feet of a drinking water well.
- Livestock watering and fencing supplies have come a long way. The importance of shoreline buffers along with a renewed interest in rotational or management intensive grazing systems has created a demand for innovative, effective, and efficient fencing and watering products. Electric fencing can consist of permanent (usually for perimeter, feedlot, shoreline fencing), semi-permanent (usually consisting of steel posts) and portable varieties (step-in posts and polywire or electrane fencing), and it is widely used for efficient grazing systems. Electric fence chargers are very important. They must be properly installed and grounded and provide a charge (joules or volts) that the type and number of animals will respect. AC (alternating current), battery and solar powered chargers are widely available.



A solar panel is being used to complement and prolong the life of a dry cell battery powered electric fence charger. Gilbert Stuart Road Demonstration Site, North Kingstown, RI.

Your actions can make a difference

Protecting and improving the quality of our water resources requires each of us to take action. To become a responsible livestock owner and land steward, learn about, plan for and carry out the steps that best suit your operation while protecting the health of your family, animals and the environment.

For More Information and Assistance:

University of Rhode Island Cooperative Extension Home*A*Syst Program, (401) 874-5398, www.uri.edu/ce/wq; for more information on private well protection and residential pollution prevention topics. For more information on sustainable landscaping and pet waste management, see our website www.uri.edu/ce/healthylandscapes

USDA Natural Resources Conservation Service and your local Conservation District, (401) 828-1300, www.ri.nrcs.usda.gov; for technical information on livestock manure management, pasture management and renovation, soil erosion and stormwater runoff control, and soil maps.

UConn Soil testing lab, (860) 486-4274 www.canr.uconn.edu/plsci/stlab.htm
UMASS Soil testing lab, (413) 545-2311 www.umass.edu/plsoils/soiltest

Penn State Agronomy Fact Sheets on various crop and soil science topics including various pasture and hay forages, and weed management in pastures, www.agronomy.psu.edu/Extension/Facts/AgFacts.htm

University of Vermont Center for Sustainable Agriculture, Pasture Network Program, www.uvm.edu/~susagctr

Visit local farm and garden supply stores for fencing or watering supplies or do an internet search on livestock watering, portable electric fencing, and permanent livestock fencing.

Visit local farms that practice sound pasture management to share innovative ideas, information and resources

Information contained in this fact sheet is partially adapted from the following sources:

Bonnie E. Lamb and W. Michael Sullivan. 1993. Horse-Keeping on Small Acreage: Protecting Groundwater and Surface Water. University of Rhode Island College of Resource Development, Department of Natural Resources Science, Cooperative Extension

Darrell L. Emmick and Dr. Danny G. Fox. 1993. Prescribed Grazing management to Improve Pasture Productivity in New York, USDA Soil Conservation Service and Cornell University Department of Animal Science.

Bill Murphy. 1987. Greener Pastures on Your Side of the Fence: Better Farming with Voisin Management Intensive Grazing, Third Edition.

Elements of a Successful Horse Grazing System, Gwyneth Harris, Vermont Pasture Network Coordinator, University of Vermont Center for Sustainable Agriculture

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