



INTEGRATING GRAZING INTO CROPPING SYSTEMS

INFRASTRUCTURE FOR INTEGRATING GRAZING INTO CROPPING SYSTEMS

Dr. Jessica Williamson, Penn State Extension

Fencing Systems

Livestock owners who are thinking about integrating their livestock into a cropping system need to consider fencing options well ahead of time. Fencing is a serious consideration for many reasons. Pennsylvania has a large rural, non-farm population, which means many cars on roads in rural areas. Livestock on roads is a safety hazard and liability concern. Furthermore, livestock that cannot be contained to their designated grazing area can cause damage to field crops and gardens on neighboring properties.

Fencing falls into two categories: permanent and temporary.

Permanent fencing is typically a physical barrier fence that creates a boundary that animals cannot physically penetrate. In most cases a permanent fence is used on the perimeter of the farm to be utilized for grazing. High-tensile wiring on driven posts is the most popular type of permanent fencing. Other types of permanent fencing include woven and box wire fences.



Fig. 1 High-tensile fence is the most common type of permanent fencing and is used as a physical barrier on the perimeters of farms. Photo courtesy of David W. Hartman, Penn State Extension



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Temporary fencing is a psychological fence that relies on moderate electrical pulses to train livestock and deter movement beyond the area being grazed. The most popular type of temporary fence is referred to as polywire. Polywire is made from metal filaments woven into plastic to make a lightweight fencing material that will carry an electrical charge. Polywire can be carried on reels, strung onto lightweight, portable “step-in” fence posts, and easily moved from place to place. Electric netting fence is constructed in a similar fashion but is made into a netting that is more effective at deterring movement of sheep and goats. Although the psychological fence made from polywire or electric netting is a viable choice for creating individual paddocks to manage grazing, it lacks the strength to physically hold cattle to any given location. Furthermore, polywire fences are vulnerable to deer if they are placed in areas where deer may frequently travel. This is an important consideration if you are in an area with an abundance of deer.



Fig. 2 Polywire is commonly used to create temporary fencing for managed grazing. It is lightweight, portable, and can be gathered on a spool and moved to another location. Photo courtesy of David W. Hartman, Penn State Extension



Fig. 3 There are many different types of “step-in” fence posts used to create temporary fencing. Two common choices are the “pigtail” post and plastic posts with several positions for polywire placement. Photo courtesy of David W. Hartman, Penn State Extension



Fig. 4 Net fencing provides an effective, temporary-fencing option for sheep and goat owners. Photo courtesy of David W. Hartman, Penn State Extension

In some situations, livestock owners use permanent fencing with one to two wires on a farm or land area that has permanent perimeter fence. This is often referred to as permanent or semi-permanent interior fencing. Most experienced graziers recommend using very little or no permanent fencing inside the main permanent fence on the perimeter of the farm. Temporary fencing is a better choice because it is easily removed, and you may want to change the paddock layout in the future. Furthermore, if cropland is being grazed, it is best to have no permanent interior fencing that could impede farm machinery operation.

Permanent fence is a serious capital investment and incurs significant cost. However, it provides security that a temporary fence made from polywire cannot provide. Livestock owners wanting to integrate livestock into a cropping system need to consider such factors as how many years they will be able to use the fields for grazing, proximity to roadways and other properties, and what class of livestock is being grazed.



Fig. 5 Temporary water units come in various shapes and sizes. This unit can be towed with an ATV and is set up to be coupled to water delivery infrastructure such as a pipe or hose. Photo courtesy of David W. Hartman, Penn State Extension



Fig. 6 Temporary water sources do not need to be fancy or expensive. This unit utilizes an old manure spreader and plastic water tank. It can be towed by tractor to a water source and filled with water, and then towed to where livestock are grazing to fill a tub. Photo courtesy of David W. Hartman, Penn State Extension

Watering Systems

The livestock owner who plans to integrate livestock into a cropping system will need to consider how water will be supplied and distributed within the grazing area. Is there a water source nearby that can be tapped into or will water need to be hauled to the site? Once the supply is determined, there are many ways to distribute the water across the fields being grazed.

Consideration needs to be given to several important aspects. Water supplied at the site needs to be of adequate quality for livestock. Testing is available to determine quality if necessary. Water-distribution equipment will need to be easily disassembled and moved out of the way of the cropping operations.

The water supply and distribution system should be capable of supplying an adequate quantity of water for the class of livestock being grazed. Water-consumption levels vary with the species of livestock, time of year, and type of forage being grazed (see Table 1).

Table 1

Livestock Species	Water Needed per Animal 50-Degree Day	Water Needed per Animal 90-Degree Day
Dry Beef Cows	8–12 Gallons	20–30 Gallons
Lactating Beef Cows	12–20 Gallons	25–35 Gallons
Lactating Dairy Cows	20–30 Gallons	30–40 Gallons
600-pound Weaned Calves	6–9 Gallons	10–15 Gallons
Sheep and Goats	2–3 Gallons	3–4 Gallons

Table taken from Watering Systems for Serious Graziers, produced by Natural Resources Conservation Service.



Fig. 7 Livestock owners wanting to temporarily graze forages on cropland need to consider how animals will be handled and loaded at the end of the grazing period. Photo courtesy of David W. Hartman, Penn State Extension

Handling Systems

Livestock owners should consider how livestock will be gathered and handled either for veterinary purposes or for loading to move from the property. If the crop fields being grazed are on the premises where the livestock are based, this becomes a question of how livestock will be moved from the areas being grazed back to the handling facilities.

If the livestock are transported from another premises, portable handling equipment needs to be considered. Establishment of permanent handling facilities will not be practical in most situations. Portable handling systems are commercially available for beef cattle and small ruminants.



Fig. 8 Shade is important for livestock during the hottest weeks of summer in Pennsylvania. Temporary, mobile shade sources can be constructed in many ways. Mobile shade reduces soil damage and nutrient concentration compared to stationary shade. Photo courtesy of David W. Hartman, Penn State Extension

Shade

One often overlooked aspect of grazing fields that are also used as part of a cropping system is shade for the livestock. Pennsylvania summers usually have stretches of hot, humid weather that is uncomfortable for livestock that are grazed. Animals grazing in hot weather eagerly seek shade. Many grazing farms allow livestock to have access to buildings, fencerows, or woods for shade. Some operations may use portable shade units that can be moved along with the animals in a rotational grazing system.

The issue of shade is a popular topic among grazing managers. Opinions vary and research is limited. In some situations, with severe heat and humidity, shade can be considered medically necessary for the well-being of the livestock. In other situations, with less severe heat and humidity, lack of shade causing heat stress will hamper animal performance, but not become a medical issue.

Complicating factors in the issue of heat stress besides ambient temperature are humidity, night-time temperature, hair coat color and type, genetics, and heavy presence of tall fescue endophyte in permanent pasture swards.

The livestock owner who is considering integrating livestock grazing into a cropping system needs to have a plan for shade. Constructing a permanent facility is not a sustainable solution since animals will have to trail back to shade each day, often from the furthest points on the farm. Furthermore, large amounts of manure will be deposited at the shade site, which will remove nutrients from the pasture and cropping program and result in costs to haul manure back to the fields or purchase nutrients to replace those lost. Portable shade units are commercially available or can be constructed using a wagon chassis or skids with shade cloth or metal roofing for shade. Grazing managers around the country have designed and constructed homemade, portable shade structures that can serve this purpose cost-effectively.

Wind Protection

In some situations, livestock will be grazing fields and be directly exposed to winter wind. Livestock can tolerate very cold temperatures; however, wind exposure during cold, wet weather can cause stress as the animals lose the insulating properties of their haircoat or wool due to saturation. Freshly shorn sheep and young animals can be of concern as well. Allowing livestock access to buildings or fencerows as a windbreak may be necessary. Without crops on the fields, this should be easy to accomplish. Another option would be to construct a temporary windbreak from large hay or straw bales.

Conclusion

Livestock owners who would like to integrate livestock grazing into cropping systems have several important considerations to make. Questions about fencing, watering systems, animal handling and loading, and shade all need to be resolved before animals are placed on the cropland to increase the likelihood of the success of the grazing program.

Resources

<http://www2.ca.uky.edu/agcomm/pubs/aen/aen99/aen99.pdf>

https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1357668.pdf

https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_010636.pdf

https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs141p2_024052.pdf

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<https://www.canr.msu.edu/uploads/236/58549/LowStressHandling.pdf>

https://www.apsc.vt.edu/content/dam/apsc_vt_edu/extension/beef/programs/vabeef-quality-assurance/12_bqa_manual/chapter_6.pdf

Prepared by David W. Hartman, Penn State Extension; Dr. Kathy J. Soder, Research Animal Scientist, USDA-ARS at University Park, PA; Dr. Sjoerd W. Duiker, Soil Management Specialist, Department of Plant Science, The Pennsylvania State University; Justin L. Brackenrich, Penn State Extension; Divya Pant, graduate student, Department of Plant Science, The Pennsylvania State University.

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