

Pasture Evaluation and Remediation Following a Storm Event

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This article is intended as an expansion of a very thoughtful and informative article published by Dr. Matt Poore several years ago. In this article he discussed multiple aspects of livestock, forage and infrastructure issues that should be considered and addressed immediately following a major storm event. That article is located here: (<http://www.cefs.ncsu.edu/whatwedo/researchunits/amazing-grazing-picking-up-after-a-storm.pdf>). Additionally, Dr. Charlotte Krugler at Clemson Livestock Poultry Health has also posted some excellent information related to Animal Agriculture Emergency Response located here: (http://www.clemson.edu/public/lph/once_flooding_has_occurred.pdf) The tips and practices we outline below are less “urgent” but may be helpful as one begins to reclaim pastures and fencelines following flooding of hayfields and pastures.

It is important to note that many pastures can flood routinely following normal but heavy rainfall events. This information below is intended to address issues from less frequent but more severe flooding events where water has been present for longer periods of time, in places not commonly flooded, or where more infrastructure damage has occurred.

Evaluate fence integrity and location

Closely examine fencing both at water gaps and along streams. Often fences are severely damaged or completely destroyed. If this is the case, fence cattle into the farm with temporary electric polywire and a small battery or solar powered strip charger or make emergency repairs to the existing permanent fence so that it will at a minimum contain animals. If possible, remove animals completely from the area. Providing high quality hay, an area with above average forage quality (ie. a pasture or hayfield on higher ground), or feeding supplements to animals may help to hold them in areas where fencing is less than ideal. Then carefully evaluate the previous fence location and determine whether or not the fence location can be improved when it is repaired or rebuilt. Now is the time to correct previous errors. Water gaps can be

redesigned using more resilient specifications. Consult with the local NRCS office for modern water gap designs. Conventional net fencing can be replaced with high tensile net wire or smooth high tensile electric strands which should be much more resistant to damage in future events. Additional bracing or even slight changes in location (moving the fence up a slope just a couple of feet) may help decrease or completely avoid damage in future floods.

Evaluate outside-stored hay sites

Rain will naturally damage uncovered hay stored outdoors. This is “normal” (but I would argue unacceptable) and producers are accustomed to dry matter losses of up to 30% and animal refusal losses of up to 20% in severe cases. HOWEVER, examine the storage site closely as soon as possible after the storm. Hay stacked in areas with standing water may have far more issues than “normal” damage. Excess moisture from standing or running water can be wicked up by bales and result in excessive mold or spoilage (Photo 1). At best, this will decrease hay intake and increase waste. In some cases, the hay may contain dangerous levels of mold and mycotoxins that will impact animal performance or health if consumed. These mycotoxins can cause decreased gains, compromised immune systems, and abortions. Being aware of these potential issues is important. Examine bales closely and core them if necessary to determine if there are internal issues. Smell



Photo 1. Bermudagrass hay bales in standing water following the flood conditions of 2015. Photo by Marion Barnes.

the hay and examine it for dustiness, off smell, or off color. Submit samples to a testing lab if any questions exist. Watch animals closely at feeding. Over the feeding period of the first bale determine if intake is consistent with expectations. Animals should consume approximately 2.5% of live body weight daily in hay. Make sure that hay disappearance is consistent with consumption and losses encountered during normal conditions.

Examine pastures and hayfields and remove dangerous material

Debris will almost certainly have been deposited by running water in the fields. Strands of barbed wire, t-posts, wild cherry limbs, scrap metal, glass bottles and various other debris should be removed prior to animals returning or pasture renovations. If cattle are watered from streams or have areas where they frequently cross the stream to access other areas of the farm, examine these areas closely for debris or changes in streambank topography etc. Also examine drinking water closely and avoid any stagnant areas which may contain microorganisms harmful to animals.

Determine the condition of forage species present in the pasture

This may be difficult to assess depending upon the time of year. Most riparian areas will be populated by species

tolerant of flooding and/or poor soil drainage. Some forages will tolerate a few days underwater, but the length of tolerance time varies widely depending upon time of year (i.e. whether the species is dormant or not), soil drainage, and temperature (higher temperatures and other stress decrease a plant's tolerance of flood conditions). Tall fescue, reed canarygrass (an uncommon but adapted species for our region) and dallisgrass are tolerant of wet soils in the Upstate, while bahiagrass and annual ryegrass are species often found in wet soils in the Coastal Plain region (Table 1). Natives like switchgrass and Eastern gamagrass will also tolerate poor drainage in both regions; however, warm season annual grasses and oats or cereal rye should be avoided. If the flooded area was predominantly bermudagrass, it is likely that it will be severely thinned or killed. If pastures are tall fescue or bahiagrass, the odds of recovery are much higher. Consult your local Extension agent if you need help assessing the pastures. They can assist you in looking at roots and determining if the plants are alive and have a chance of recovering.

Formulate a plan for replacing the stand, if necessary

This gets a little more complicated and is very timeline dependent. Are hay stores adequate? Is forage needed quickly? How thin is the stand? Can it be thickened or SHOULD it be thickened? What forage can be added to compliment a thinned (but not killed) stand? For tall

fescue stands, additional tall fescue seed can be planted to thicken stands easily and effectively during the fall and early winter months. White clover also can be added in wet soils throughout fall and winter if weed pressure is not expected to be high and fertility is adequate. If other species like dallisgrass are present, try to determine if there is enough present to fill voids and improve the stand over time. Avoid adding moisture sensitive forages like orchardgrass, small grains, or bermudagrass in flood prone areas. In damaged bermudagrass pastures, annual ryegrass can be interseeded into areas that were injured this fall. These ryegrass areas can be grazed in winter months then renovated in early spring with bahiagrass or natives like Eastern gamagrass or switchgrass which should tolerate future flooding events and wet soils.

Table 1. Forage species for South Carolina and their tolerance to poorly drained soils. (Adapted from Ball et al., 2015. Southern Forages. Table A16).

Species	Seedling Vigor	Tolerance to Poor Drainage
Bahiagrass	Poor	Good
Bermudagrass	Fair or vegetative	Poor
Dallisgrass	Poor	Excellent
Switchgrass	Poor	Fair
Eastern gamagrass	Poor	Excellent
Big Bluestem/Indiangrass	Poor	Poor
Warm Season Annual Grasses	Good/Excellent	Poor
Orchardgrass	Fair	Poor
Tall Fescue	Good	Good
Reed Canarygrass	Fair	Excellent
Annual Ryegrass	Good	Excellent
Oats/Rye	Excellent	Fair
Wheat	Excellent	Good

Measure soil fertility of the site using soil testing prior to making any renovation or replacement decisions

Nitrogen and potassium are very mobile in water and it is likely that the site will need additional fertilizer for successful forage establishment or more rapid recovery.

Plan ahead for weed control

Water flow across fields will bring weed seed, expose seed from the soil bank, and also remove potassium making weeds more competitive. Strongly consider applying preemergent herbicides in bermudagrass hayfields in late winter and early spring to keep these weeds in check. A

little bit of forward planning will go a long way in keeping bermudagrass hayfields clean and competitive.

Hopefully the above guidelines will assist in assessing and renovating flood damaged pastures. Feel free to contact your local county extension agent with any questions you may have regarding forage selection or establishment methods.

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