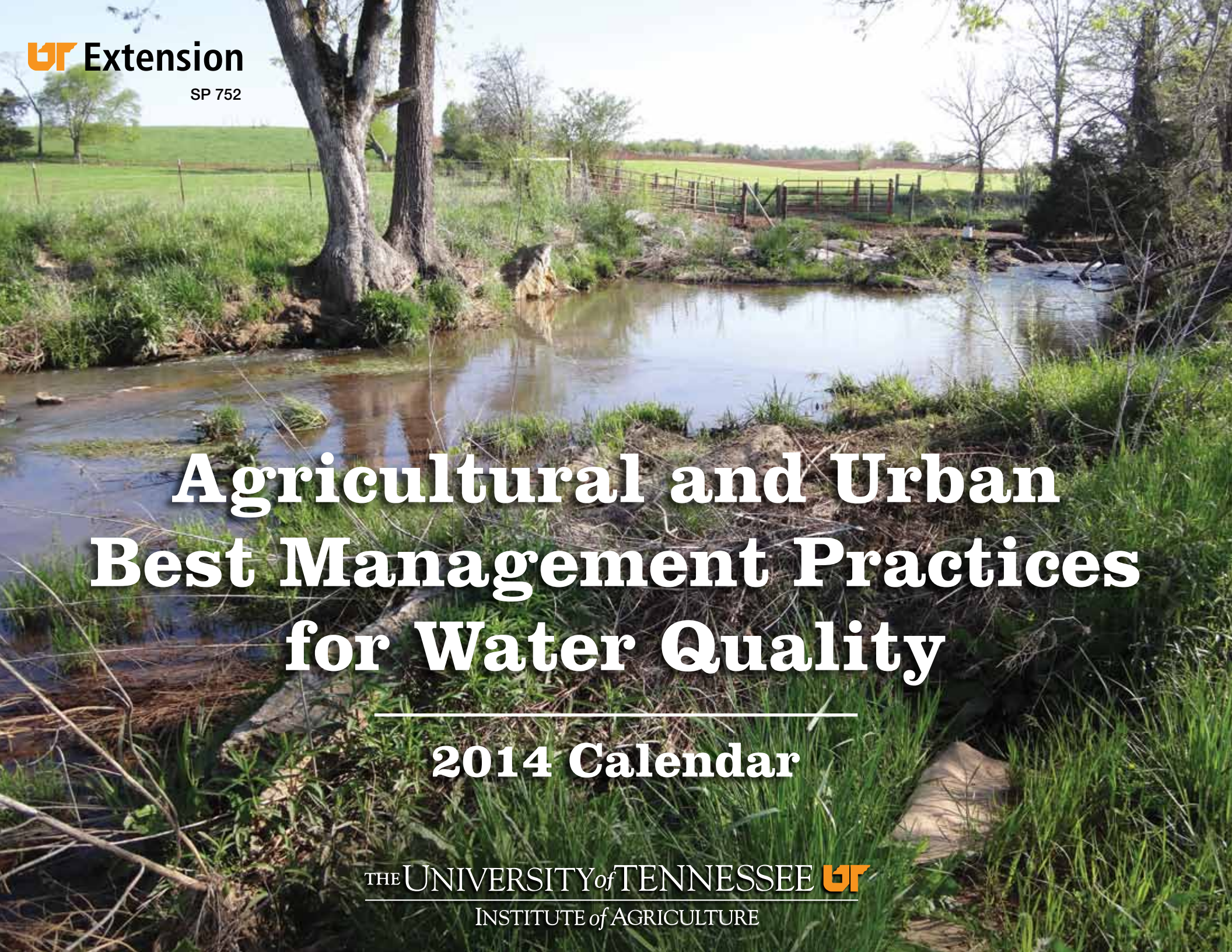
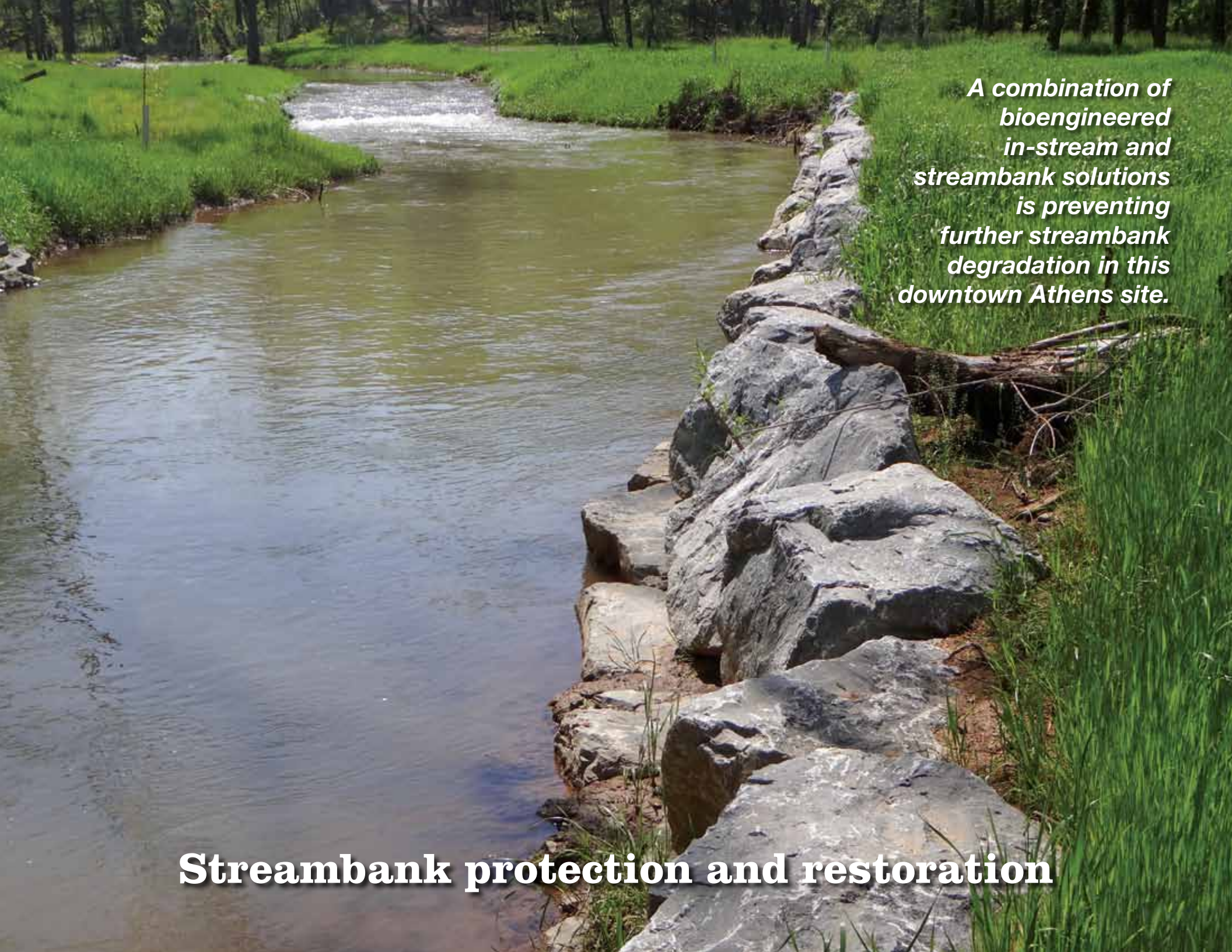




Agricultural and Urban Best Management Practices for Water Quality

2014 Calendar

A photograph of a stream with a rocky bank. The stream flows from the background towards the foreground, where it meets a series of large, grey, rectangular rocks that form a bank. The water is a murky brown color. In the background, there is a small waterfall or drop in the stream, surrounded by lush green grass and trees. The sky is not visible.

*A combination of
bioengineered
in-stream and
streambank solutions
is preventing
further streambank
degradation in this
downtown Athens site.*

Streambank protection and restoration

JANUARY 2014

Topic: Streambank protection and restoration

Definition:

- Stabilizing streambanks to reduce erosion and channel incision (down-cutting).
- Restores the natural pools and riffle pattern in the stream channel to allow the stream to recover ecological functions.

What it does for you:

- Reduces property losses due to streambank failure and erosion.
- Protects your livestock from injury due to unstable streambanks.

What it does for water quality:

- Greatly reduces sediment loads into the stream or river.
- Improves the habitat for aquatic species such as fish.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1 New Year's Day	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20 Martin Luther King Jr. Day	21	22	23	24	25
26	27	28	29	30	31	



*Heavy-use cattle crossing
in McMinn County.*

Heavy-use area protection and management

FEBRUARY 2014

Topic:
Heavy-use area protection and management.

Definition:

Heavy-use areas are protected with permeable pavements, geotextile fabric, vegetation and gravel to reduce erosion and the frequency of muddy conditions in areas that receive heavy livestock traffic.

What it does for you:

- Decreases occurrence of gully erosion and persistent muddy conditions.
- Increases water clarity.

What it does for water quality:

- Reduces soil erosion.
- Reduces sediment and organic loads into streams.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17 Presidents Day	18	19	20	21	22
23	24	25	26	27	28	

FOLD FIRST

SOIL SAMPLING INSTRUCTIONS

1. To obtain a representative SAMPLE, collect portions or cores of soil from 18 to 20 locations within a sampling area. The SAMPLE should not represent an area greater than 10 acres.
2. Soils that differ significantly in production should be sampled separately if the area can be fertilized separately. Avoid sampling in fertilizer bands or small unrepresentative areas.
3. Depth to sample: Collect samples for pH and nutrient determinations (P, K, micronutrients) to a depth of six (6) inches in all types of cropping systems.

Collecting a representative soil sample from pasture and hay fields is an important first step in developing a good fertility management program for your farm.

Pasture management

MARCH 2014

Topic:
Pasture management

Definition:

Optimizing the production and quality of forage grown on a pasture through soil testing, applying recommended rates of fertilizers and lime, weed control, and renovation with legumes and grasses.

What it does for you:

- Increases forage production and forage quality.
- Increases profits from your pasture.
- Reduces the amount of supplemental hay and feeds for livestock.

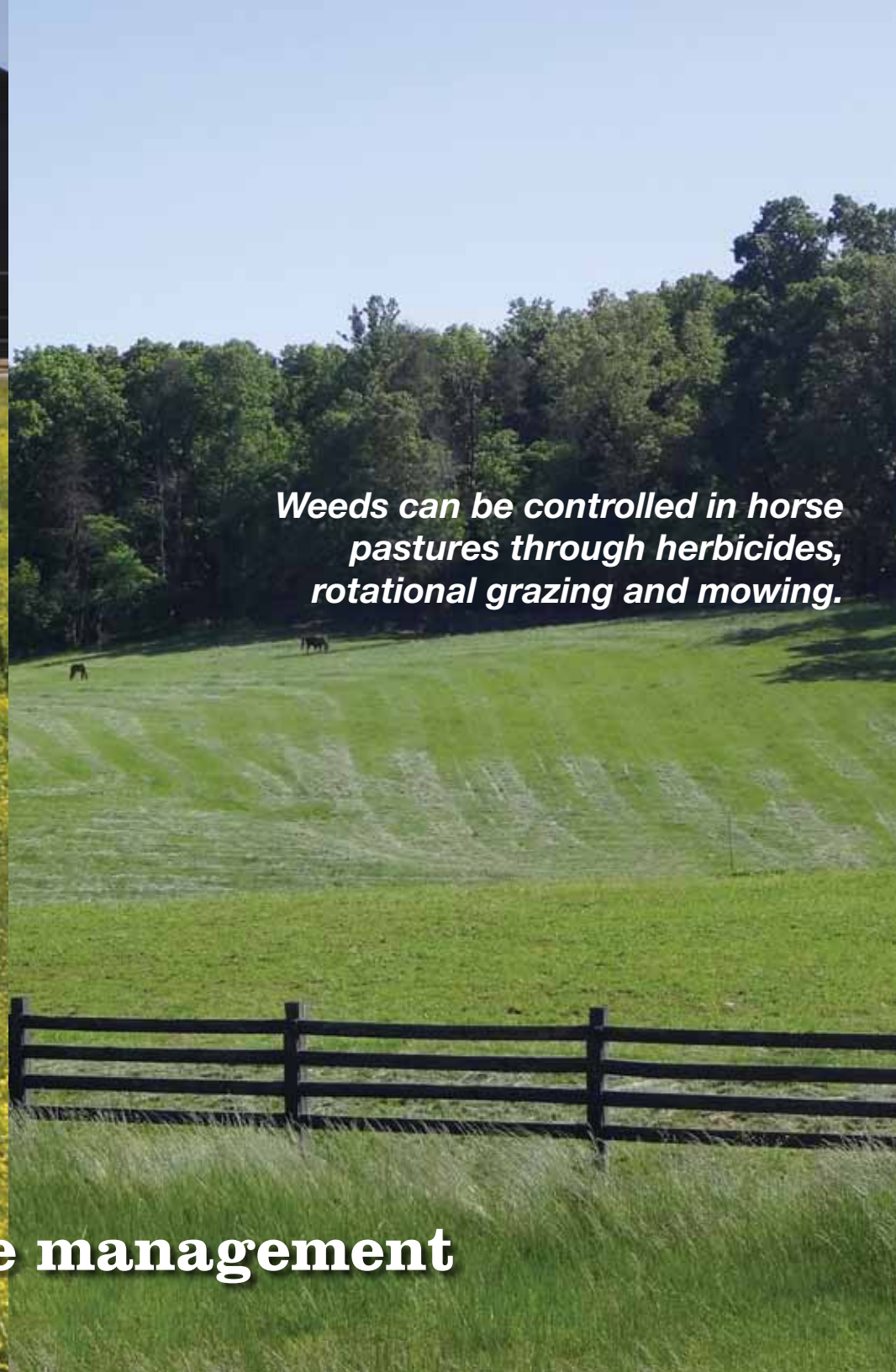
What it does for water quality:

Reduces soil erosion, nutrient and manure losses from pastures, which in turn reduces sediment, nutrient and pathogen loads to nearby streams, rivers and ponds.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					



Horse pasture management



Weeds can be controlled in horse pastures through herbicides, rotational grazing and mowing.

APRIL 2014

Topic:
**Horse pasture
management**

Definition:

Optimize the quality and quantity of forages on horse pastures through soil fertility management, effective weed control, periodic mowing and rotational grazing.

What it does for you:

- Increases forage production and forage quality.
- Reduces the amount of supplemental hay and other feed needed for horses.
- Rotational grazing optimizes health and nutrition for horses.

**What it does for water
quality:**

Reduces soil erosion, nutrient and manure losses from pastures, which in turn reduces sediment, nutrient and pathogen loads to nearby streams, rivers and ponds.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			



Before

*Erosion losses from bare soil are high.
The easiest way to reduce erosion is to vegetate!*



After

Vegetation of loafing areas

MAY 2014

Topic:
Vegetation of loafing areas

Definition:

Loafing areas are commonly found adjacent to milking parlors on dairy farms. It is important to manage these areas to optimize grazing production and minimize erosion losses.

What it does for you:

- Increases production of grass from low-producing fields.
- Keeps animals cleaner during rainy periods.
- Can improve milk quality.

What it does for water quality:

Reduces the amount of soil erosion, pathogens and manure pollution from dairy operations.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26 Memorial Day	27	28	29	30	31



Providing animals with well-designed travel lanes can improve hoof health and greatly reduce erosion. Travel lanes should be of a minimum width and can be protected with gravel or vegetation.

Managing cattle movement

JUNE 2014

Topic:
Managing cattle movement

Definition:

Cattle movement can be managed by providing alternative water sources, fencing and shade to regulate the movement of cattle; rotating grazing and feeding areas; and optimizing the use of pasture across the whole field, while avoiding overgrazing or over-trampling of vegetation that could increase erosion.

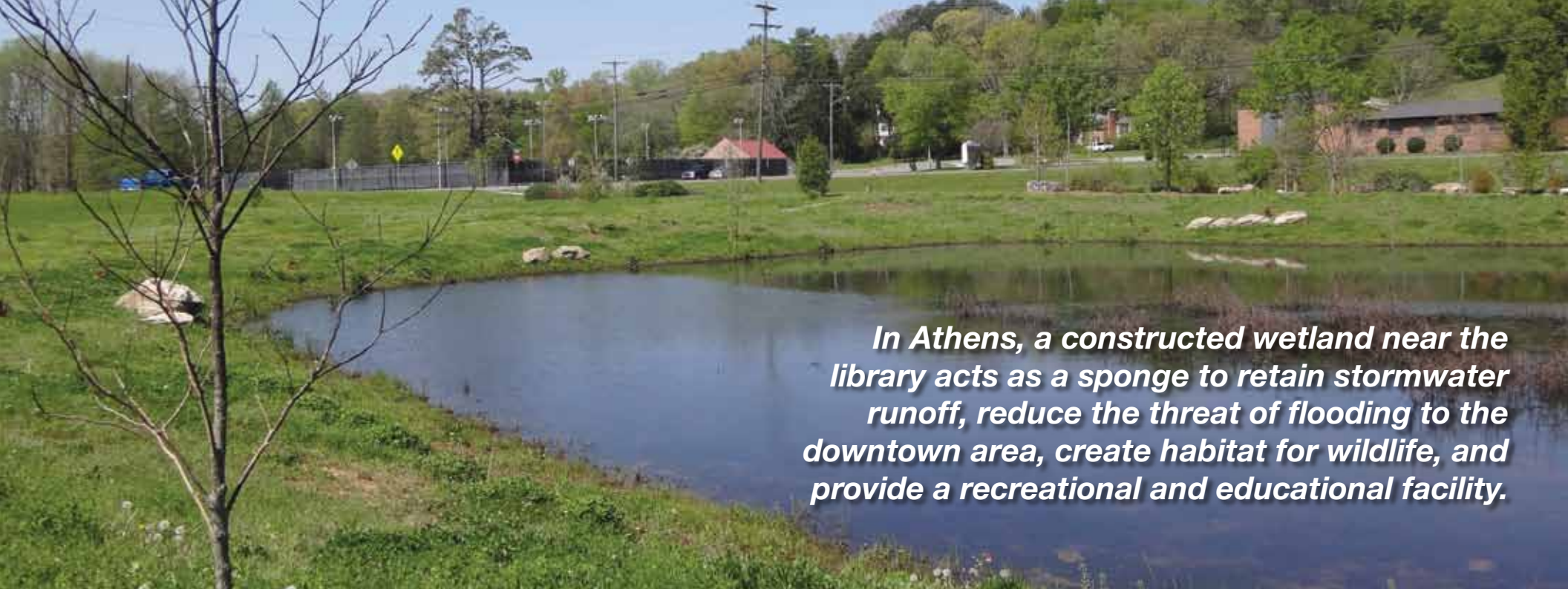
What it does for you:

- Increases the use of fodder from a pasture.
- Allows increased stocking rates.
- Provides clean sources of water, which is better for animal health.

What it does for water quality:

- Reduces erosion, sediment and pathogen losses from pastures.
- Protects streambanks and streambeds from erosion by cattle.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					



In Athens, a constructed wetland near the library acts as a sponge to retain stormwater runoff, reduce the threat of flooding to the downtown area, create habitat for wildlife, and provide a recreational and educational facility.



A pervious parking lot and rain garden (near the Municipal building in Athens) infiltrate rainfall and runoff into the ground while filtering out pollutants carried by stormwater.

Reducing runoff from urban areas

JULY 2014

Topic:
Reducing runoff from urban areas

Definition:

Infiltration practices (like permeable pavements and rain gardens) collect, retain and filter urban runoff from parking lots, roadways and rooftops.

What it does for you:

- Reduces the potential for localized flooding in urban areas.
- Reduces the need for irrigation.
- Increases property aesthetics by using more vegetation.

What it does for water quality:

Reduces the volume and load of contaminated water and pollutants entering nearby streams and rivers.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4 Independence Day	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Providing livestock with alternative water gives them a safe and secure source and reduces stream and river pollution.



Alternative watering systems

AUGUST 2014

Topic:

Alternative watering systems

Definition:

Provide an alternative, cleaner water source for pasture animals than allowing direct access to streams, ponds and lakes.

What it does for you:

- Provides for year-round supply of clean water for livestock.
- Gives greater flexibility in managing pasture systems.
- Reduces potential for injury to animals while watering.
- Can increase the amount of pasture grazed by animals by positioning waterers in areas cattle usually ignore.
- Increases water consumption, as water in insulated containers is warmer in winter and cooler in summer.
- Decreases the potential for transmission of diseases such as Cryptosporidia, Coccidiosis, Salmonella, E. Coli, Leptospirosis and Johne's disease from the manure of infected animals to other animals in the herd or herds living downstream.
- Saves money on associated veterinary costs with diseases such as Cryptosporidia, Coccidiosis, Salmonella, E. Coli, Leptospirosis and Johne's disease.

What it does for water quality:

By restricting or reducing animals' access to streams and rivers:

- Streambank erosion is reduced due to traffic and cattle paths.
- Sediment, pathogen and nutrient runoff are reduced.
- If shade and water are available away from the stream, cattle will not stay in the stream and directly contaminate the water.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						



Before



After

Maintaining a permanent vegetative cover is the most effective way of saving streambanks from erosion and improving water quality.

Vegetating bare soil

SEPTEMBER 2014

Topic:

Vegetating bare soil

Definition:

Improving plant growth on exposed soils with vegetation by adding the recommended rates of lime and fertilizer to fields, seeding with the appropriate grasses, and live staking streambanks with certain plant species.

What it does for you:

- Greatly reduces soil loss from erosion.
- Reduces gully formation.
- Increases agricultural production from unproductive areas.
- Stabilizes streambanks by root growth.

What it does for water quality:

- Greatly reduces the amount of sediment, nutrients and bacteria in runoff to nearby streams and rivers.
- Improves clarity of water and fish habitat.
- Grass is a living filter that will physically catch, hold and absorb soil, nutrients and manure.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 Labor Day	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

A large pile of wood chips, used for animal disposal, sits in a grassy field. In the background, there is a dirt road and a line of trees under a cloudy sky.

In Tennessee dead animals can be buried or disposed of in some landfills. The University of Tennessee has demonstrated that covering animals with at least 2 feet of wood chips is an effective, inexpensive and environmentally sound way of disposing of large carcasses.

Dead animal management

OCTOBER 2014

Topic: Dead animal management

Definition:

Proper disposal of carcasses of dead animals by burying, composting, incinerating or rendering.

What it does for you:

- Reduces odors.
- Keeps down neighbor complaints.
- Animal carcass “boneyards” decrease the value of your property.
- Reduces the number of stray animals and vermin in and around your farm. These animals can carry diseases that cause problems with livestock and can injure or kill weak livestock.
- Improves herd health by removing rotting flesh and disease-causing bacteria from the stream.

What it does for water quality:

Placing animal carcasses in graves (instead of ditches) decreases rotting flesh washing into streams, as well as disease-causing bacteria being ingested by cattle farther downstream.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
12	13 Columbus Day	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

A photograph of a stream crossing in a rural landscape. The stream flows through a gravel bed that has been constructed to prevent erosion. The banks are lined with stones and geotextile fabric. A wooden fence runs along the right side of the stream. In the background, a green hillside with several cows grazing is visible under a clear blue sky.

Stream crossings constructed using geotextile fabric and gravel protect the stream channel from erosion and provide livestock a safe passage to the other side!

Stream crossings

NOVEMBER 2014

Topic:

Stream crossings

Definition:

Stream crossings are constructed of geotextile and gravel and built to withstand water force and flooding. They improve access for livestock and allow vehicles to cross. Some fencing is included to allow livestock to drink only at the stream crossing where the streambed is protected.

What it does for you:

- Provides a stable crossing area that protects your streambanks from erosion and damage.
- Reduces animal injury by providing a mud-free crossing location.
- Provides a solid, safe crossing point for trucks and farm equipment.
- Restricting cattle access to streams encourages vegetative buffer growth along streambanks.

What it does for water quality:

- Reduces streambank erosion by animals and equipment.
- Reduces the amount of sediment, nutrients, pathogens and manure getting into streams.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5	6	7	8
9	10	11 Veterans Day	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27 Thanksgiving	28	29
30						

The composting of manures can be accelerated by the addition of woody products such as wood chips. Monitoring the temperature of the manure pile gives a good indication of when the ideal mixture is achieved. Under ideal conditions the temperatures can easily reach 130 to 150 degrees!



Manure composting

DECEMBER 2014

Topic:
Manure composting

Definition:

Controlled aerobic decomposition of animal manures and poultry litter to produce a stable, homogenous, soil-like amendment.

What it does for you:

- Converts animal manures and poultry litter into a valuable soil amendment.
- Reduces the potential for parasite transmission in pastures.
- Can kill weed seeds if the temperature of the pile exceeds 130 degrees for several days.

What it does for water quality:

Reduces the potential load of manure solids, pathogens and nutrients into nearby streams and rivers.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25 Christmas	26	27
28	29	30	31			



Streambank restoration, in-stream improvements and riparian plantings in Athens protect water quality and improve fish and wildlife habitats.



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Visit the UT Extension website at
<https://utextension.tennessee.edu>

All photos taken in the Pond Creek and Oostanaula watersheds (McMinn, Monroe and Loudon counties in East Tennessee) except for October and December photos from the UT Dairy AgResearch and Education Center (Lewisburg) and the UT Middle Tennessee AgResearch and Education Center (Spring Hill).

Calendar created by faculty and staff of the University of Tennessee Institute of Agriculture:
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**Tennessee Department
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For more information for the best management practices described in this calendar visit:

<https://ag.tennessee.edu/watersheds/Pages/Calendar2014.aspx>

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