



# SWITCHGRASS


by Ken J. Goddard  
UT Extension

Switchgrass is a warm-season  
perennial grass native to  
North America.

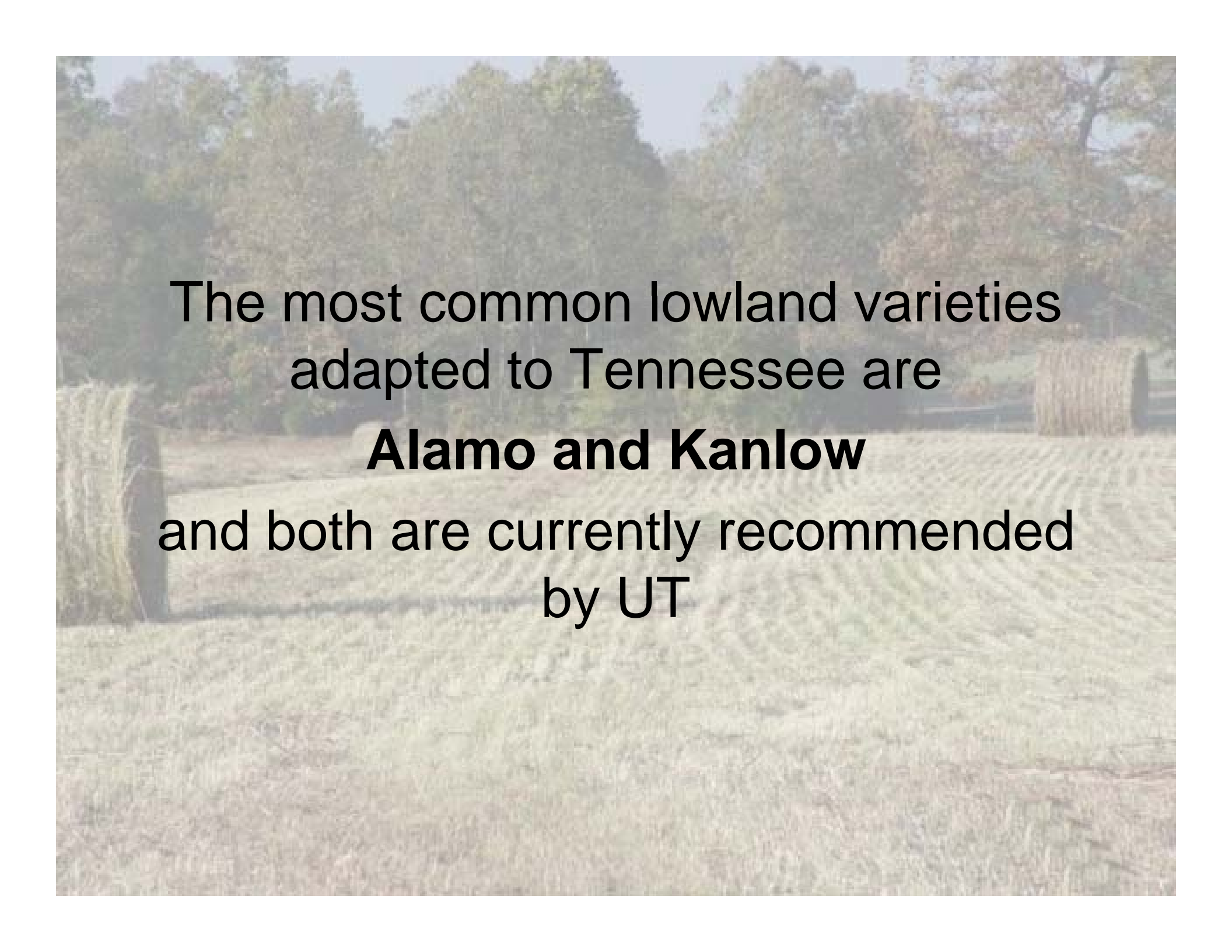
A photograph of a rural landscape. In the foreground, there is a field of dry, yellowish-brown grass. In the middle ground, several large, rectangular hay bales are visible, some stacked. In the background, there is a dense line of trees with green and some autumn-colored foliage. The sky is a pale, overcast blue.

Switchgrass adapts well to a variety of soil and climatic conditions.

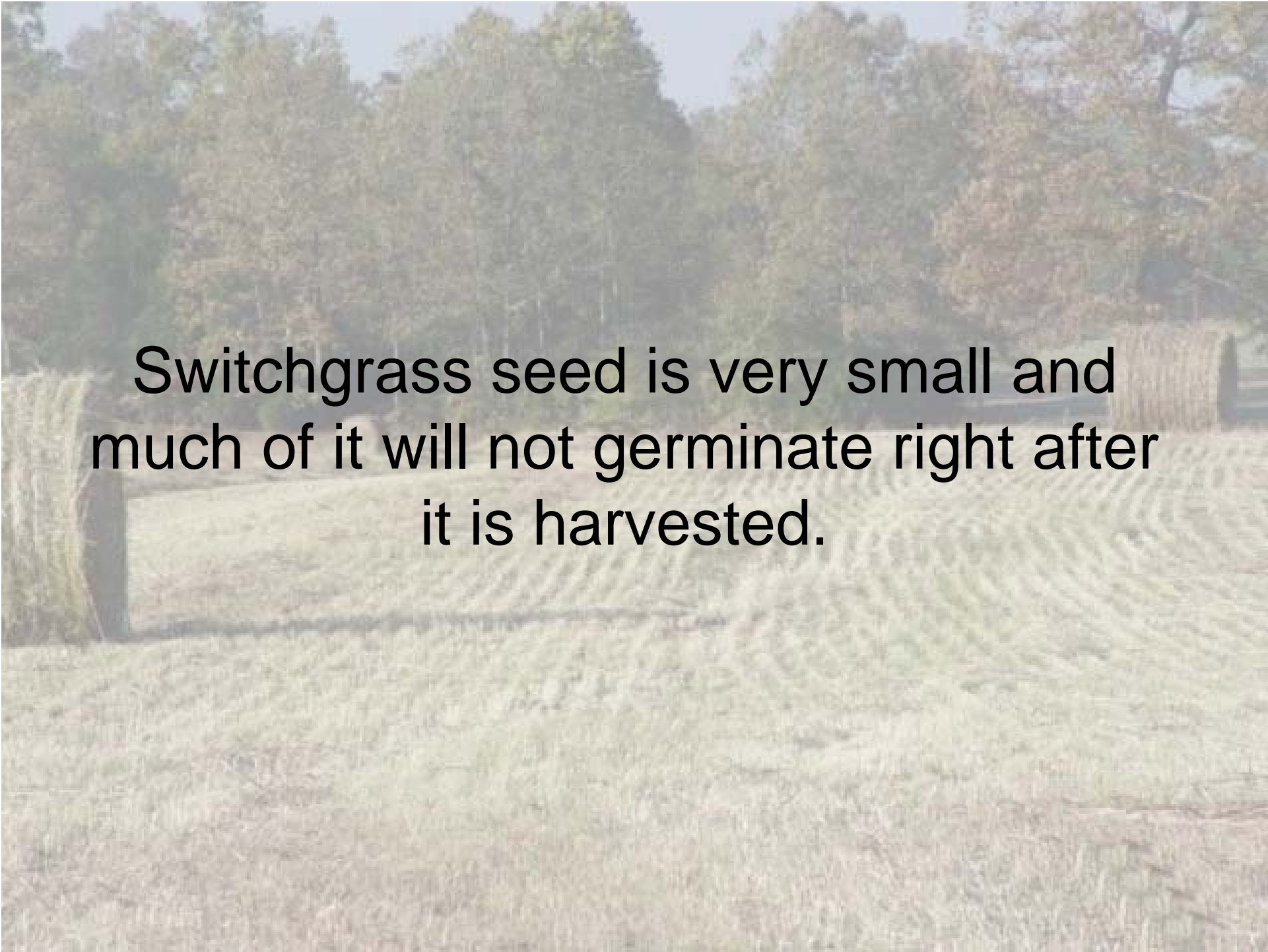
It is most productive on moderately well to well-drained soils of medium fertility and a soil pH at 5.0 or above.

A photograph of a rural farm scene. In the foreground, there is a field of tall, dry, yellowish-brown grass, likely switchgrass. A wooden fence runs across the middle ground. In the background, there are several large, leafy trees under a clear sky. The text is overlaid on the image.

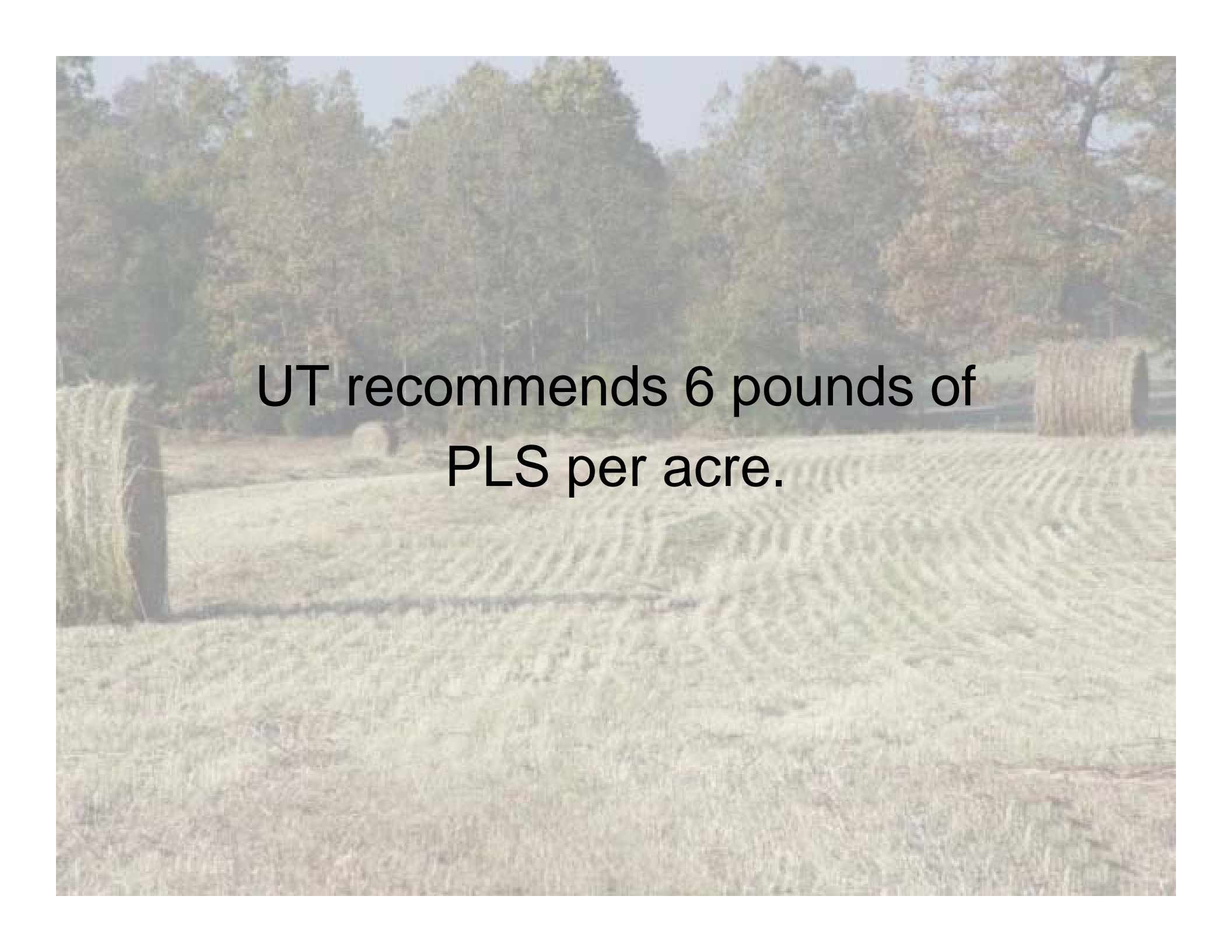
It is anticipated that switchgrass can yield sufficient biomass to produce approximately 500 gallons of ethanol per acre.

A rural landscape featuring a field of dry, golden-brown grass in the foreground. In the middle ground, there are several large, rectangular hay bales. The background is filled with a dense line of trees with green and some autumn-colored foliage under a clear sky. The text is overlaid on this scene.

The most common lowland varieties  
adapted to Tennessee are  
**Alamo and Kanlow**  
and both are currently recommended  
by UT

A photograph of a rural farm scene. In the foreground, there is a field of harvested switchgrass, appearing as a dense layer of light-colored, dry grass. A wooden fence runs across the middle ground. In the background, there are several large trees with green and some autumn-colored leaves. The sky is a pale, overcast blue. The text is overlaid on the center of the image.

Switchgrass seed is very small and much of it will not germinate right after it is harvested.

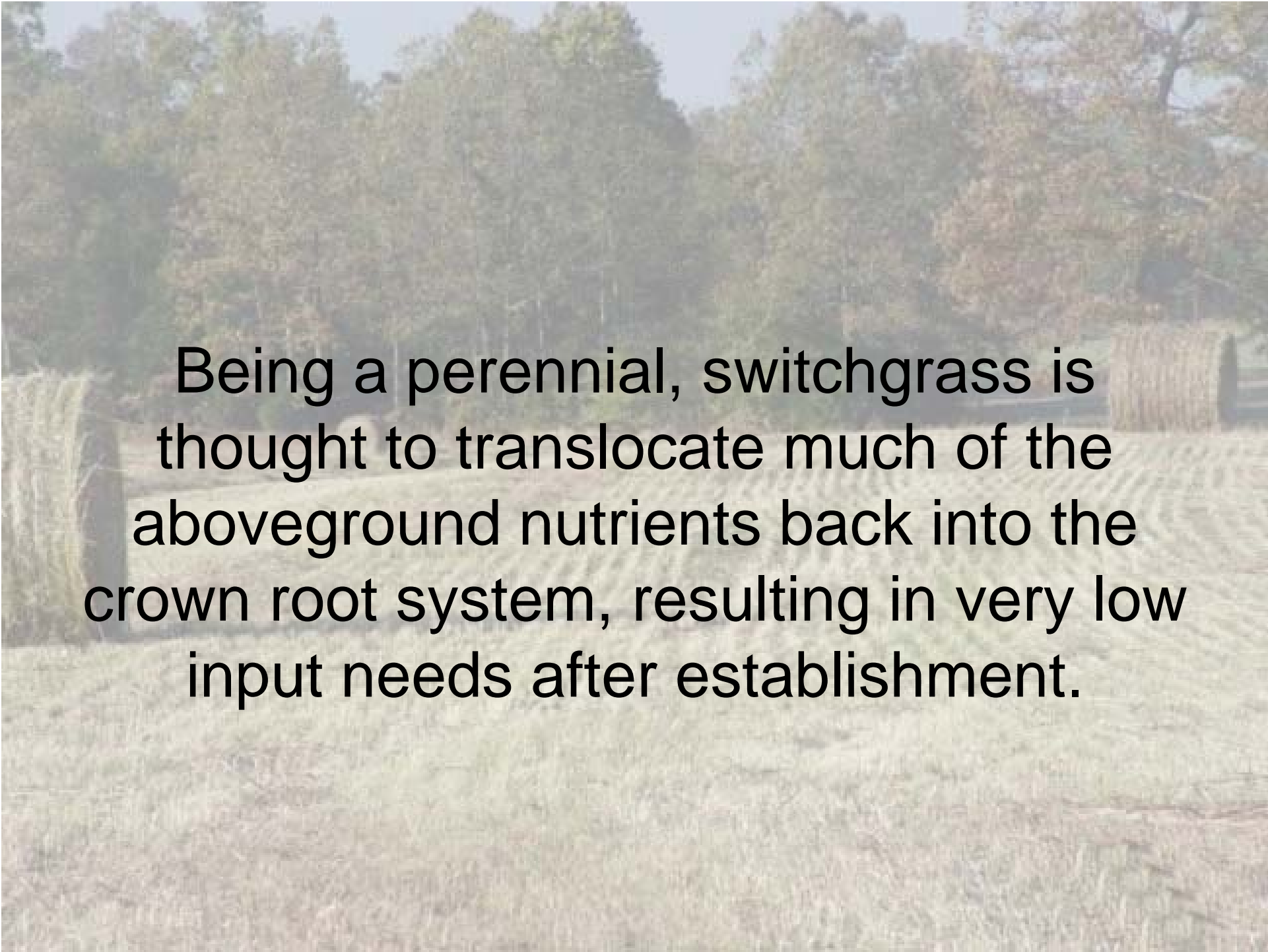
A photograph of a rural landscape. In the foreground, there is a field of dry, yellowish-brown grass or hay. In the middle ground, there are several large, rectangular hay bales. The background is filled with a dense line of trees with green and some autumn-colored foliage. The sky is a pale, hazy blue. The overall scene is a typical rural farm setting.

UT recommends 6 pounds of  
PLS per acre.


# Table 1.

## Soil Test Recommendations for Establishment and Maintenance of Switchgrass for Biomass

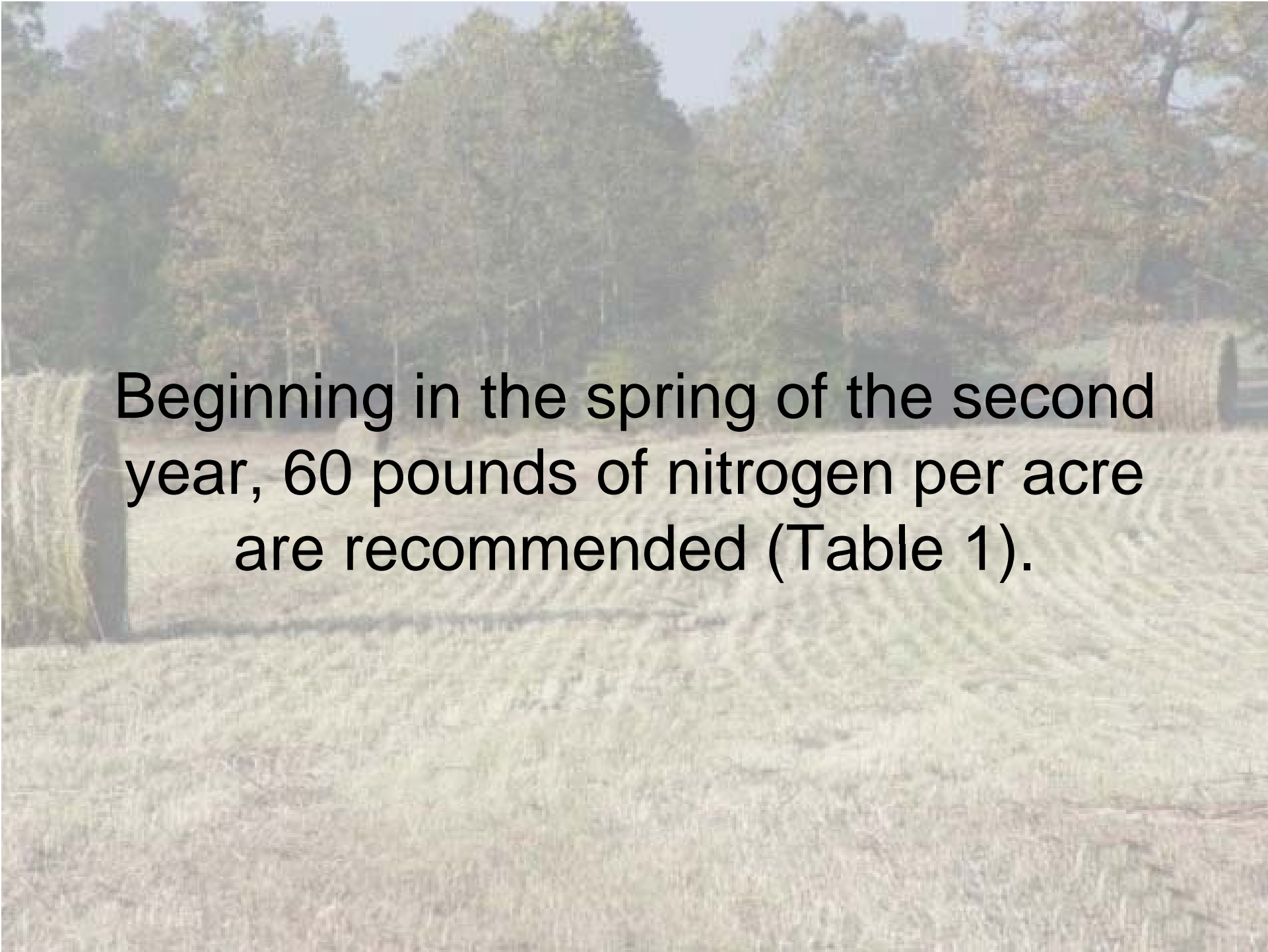
Practice	Nitrogen	Phosphate ( $P_2O_5$ )			Potash ( $K_2O$ )		
	Soil Test Levels*						
	(NT)	L	M	H	L	M	H
1. Establishment Year	0	40	0	0	80	0	0
2. Maintenance Year	60	40	0	0	80	0	0
*NT = Not Tested    L = Low    M=Medium    H= High							

A photograph of a rural farm scene. In the foreground, there is a field of tall, dry, yellowish-brown grass, likely switchgrass. A wooden fence runs across the middle ground. In the background, there is a large, dark-colored barn or farmhouse. The sky is overcast and grey. The overall scene is somewhat hazy and has a muted color palette.

Being a perennial, switchgrass is thought to translocate much of the aboveground nutrients back into the crown root system, resulting in very low input needs after establishment.



In the first year, **do not** apply nitrogen.  
It increases competition from annual  
grasses and broadleaf weeds.

A photograph of a rural landscape. In the foreground, there is a field of dry, yellowish-brown grass. In the middle ground, there is a wooden fence and a large, dark-colored barn. The background is filled with a dense line of trees with green and some autumn-colored foliage. The sky is a pale, overcast blue.

Beginning in the spring of the second year, 60 pounds of nitrogen per acre are recommended (Table 1).

A rural landscape featuring a field of dry grass in the foreground, a line of trees in the middle ground, and a barn in the background. The scene is slightly hazy, suggesting a misty or overcast day.

## Planting Date

Planting dates can range from late April to mid June. Switchgrass is a warm-season grass and establishes and grows best under warm conditions.

A photograph of a rural landscape. In the foreground, there is a field of switchgrass. In the middle ground, there are several large hay bales. In the background, there is a line of trees under a clear sky. The text is overlaid on the image.

## **Planting Methods**

Switchgrass can be planted into a tilled seedbed or no-tilled.

A photograph of a rural farm scene. In the foreground, there is a field of dry, yellowish-brown grass or hay. In the middle ground, there are several large, rectangular hay bales. In the background, there is a dense line of trees with green and some autumn-colored foliage. The sky is a pale, overcast blue. The overall scene is a typical farm landscape.

## Soil Preparation

It appears no-till planting with a no-till drill in fields not bedded from past row crops is the ideal way to plant.

A photograph of a rural landscape. In the foreground, there is a field of dry, yellowish grass. In the middle ground, there are several large, rectangular hay bales. In the background, there is a dense line of trees with green and some autumn-colored foliage. The sky is a pale, overcast blue.

## Soil Moisture

Switchgrass should be planted when sufficient soil moisture is available for emergence of the seeds.

A rural landscape featuring a field with rows of crops, several large hay bales, and a dense line of trees in the background under a clear sky.

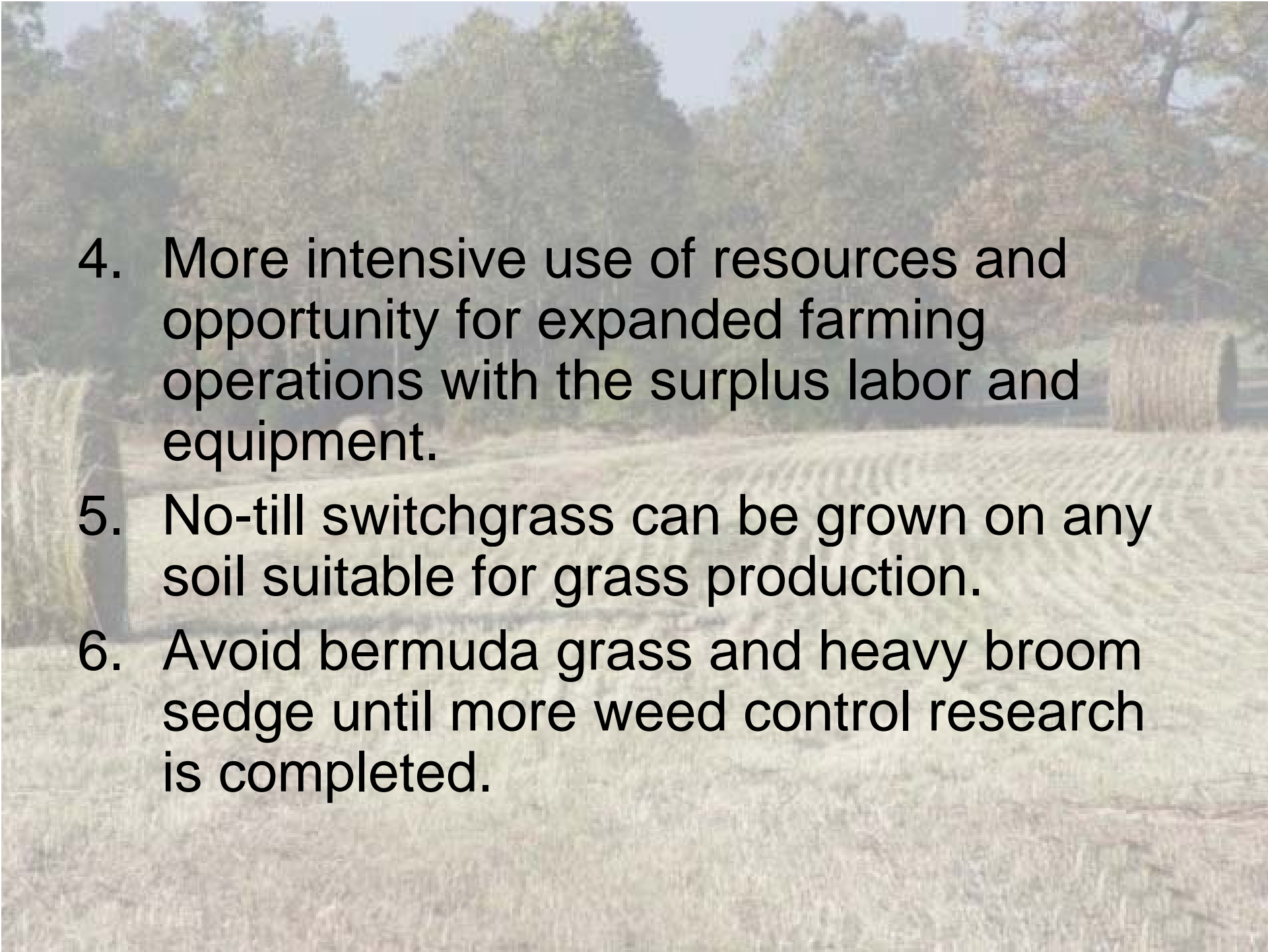
## Planting Depth

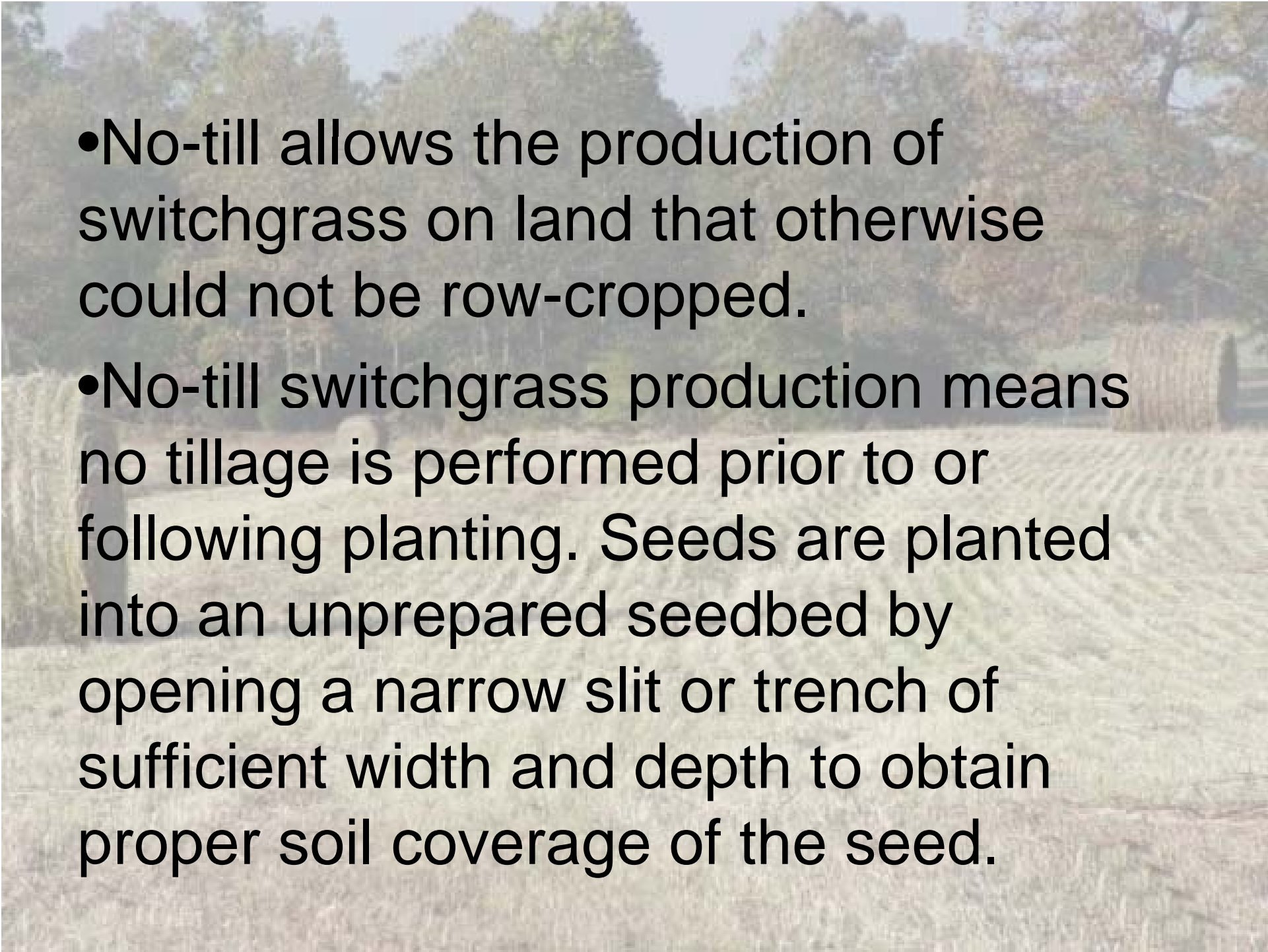
A planting depth of  $\frac{1}{4}$  to no deeper than  $\frac{1}{2}$  inch is critical with good seed coverage at that depth

## No-till Advantage

No-till switchgrass has been a proven practice in Tennessee. Factors contributing to this are:

1. Lower production cost due to reduced machinery, labor and energy requirements.
2. Reduced soil erosion.
3. Yields equal to or greater than conventionally-planted switchgrass.

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- A rural farm scene with a field, hay bales, and trees. The image is slightly faded and serves as a background for the text.
4. More intensive use of resources and opportunity for expanded farming operations with the surplus labor and equipment.
  5. No-till switchgrass can be grown on any soil suitable for grass production.
  6. Avoid bermuda grass and heavy broom sedge until more weed control research is completed.

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- No-till allows the production of switchgrass on land that otherwise could not be row-cropped.
  - No-till switchgrass production means no tillage is performed prior to or following planting. Seeds are planted into an unprepared seedbed by opening a narrow slit or trench of sufficient width and depth to obtain proper soil coverage of the seed.

## Mulches

- A mulch or ground cover is very important to successful no-till switchgrass production.
- Reduced soil erosion
- Lowers moisture evaporations
- Helps prevent crusting
- Improves water infiltration and percolation
- Aids in weed control
- Several different mulches have been used in the planting of no-till switchgrass.

## Winter Cover Crop

Growing small grain or other cover crops in the winter is an excellent deterrent to soil erosion and makes a good mulch for no-till switchgrass.

If the winter cover crop is grazed, livestock should be removed in time to allow regrowth of at least 6 inches for better ground cover and more effective kill from the burndown herbicide. Winter cover crops allow for earlier planting than behind small grain stubble. Planting switchgrass behind an early hay cutting can be ideal if moisture is available.

## Old Crop Residue

- Crop residues from corn, soybeans or grain sorghum can be used as a mulch.
- Special attention to weed control is necessary to successfully no-till in old crop residues.
- Weeds such as goldenrod and horseweed have been more of a problem in old crop residue. In addition more extensive growth of winter annuals is common.
- Earlier planting normally results in increased yields during year one of switchgrass production.

## Old Pasture Sod

Old sod can make an excellent mulch for switchgrass. However, if the pasture is infested with dallisgrass, bermuagrass or broomsedge, it should not be no-till planted as present herbicides will not effectively control these weeds. This type of pasture should be tilled and planted conventionally until problem weeds are under control.

# No-till Planting Equipment

Drills designed for no-till planting are essential.

Some important components of no-till drills are:

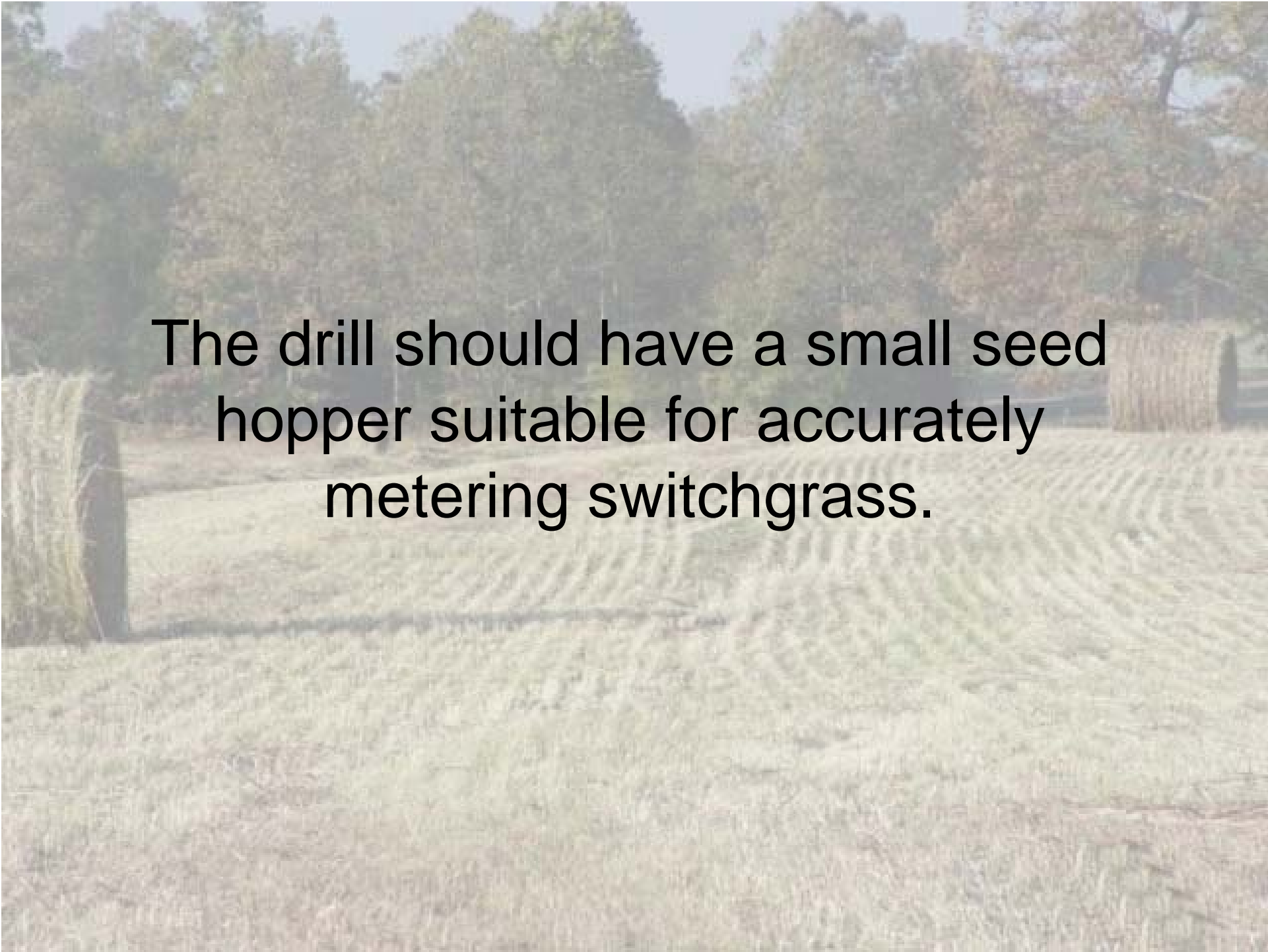
- Coulters, double disk openers and press wheels. The coulter cuts through the mulch and opens a furrow.
- Seed is placed in the ground at proper depth between the disc openers.
- Press wheels cover seed and firm the soil for good seed-soil contact.

In absence of coulter, off-set double disk openers have worked very well.

# Lime and Fertilizer

Limestone, phosphate and potash applications should be based on a soil test. UT cellulosic fertility recommendations are below.

Practice	Nitrogen	Phosphate ( $P_2O_5$ )			Potash ( $K_2O$ )		
	Soil Test Levels*						
	(NT)	L	M	H	L	M	H
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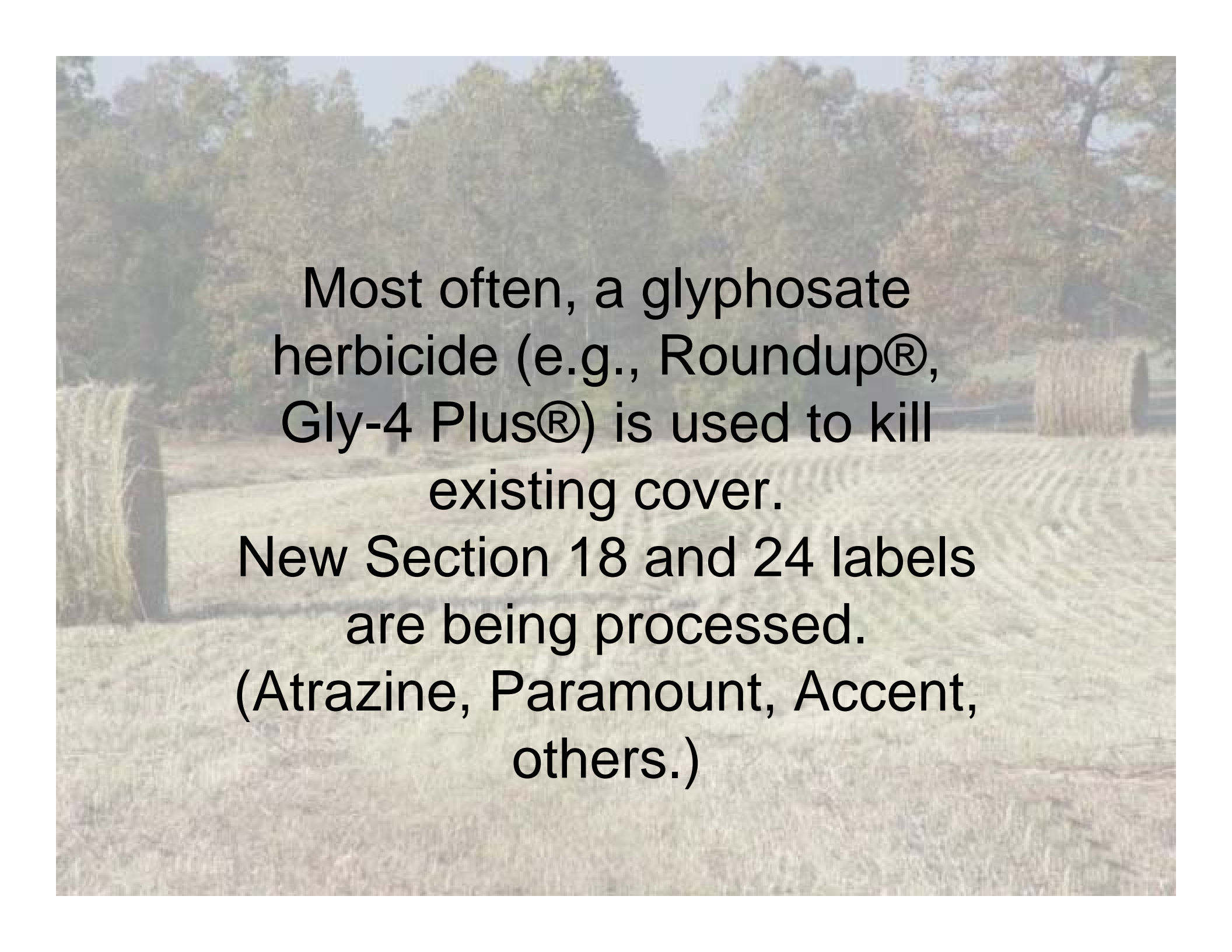
A photograph of a rural farm scene. In the foreground, there is a field of switchgrass. In the middle ground, there are several large hay bales. In the background, there is a line of trees and a building. The text is overlaid on the image.

The drill should have a small seed hopper suitable for accurately metering switchgrass.

The background image shows a rural farm scene. In the foreground, there is a field of dry, yellowish-brown grass. In the middle ground, there is a wooden fence and a large, dark-colored barn. The background is filled with a dense line of trees with green and some autumn-colored foliage under a clear sky.

## Weed Control

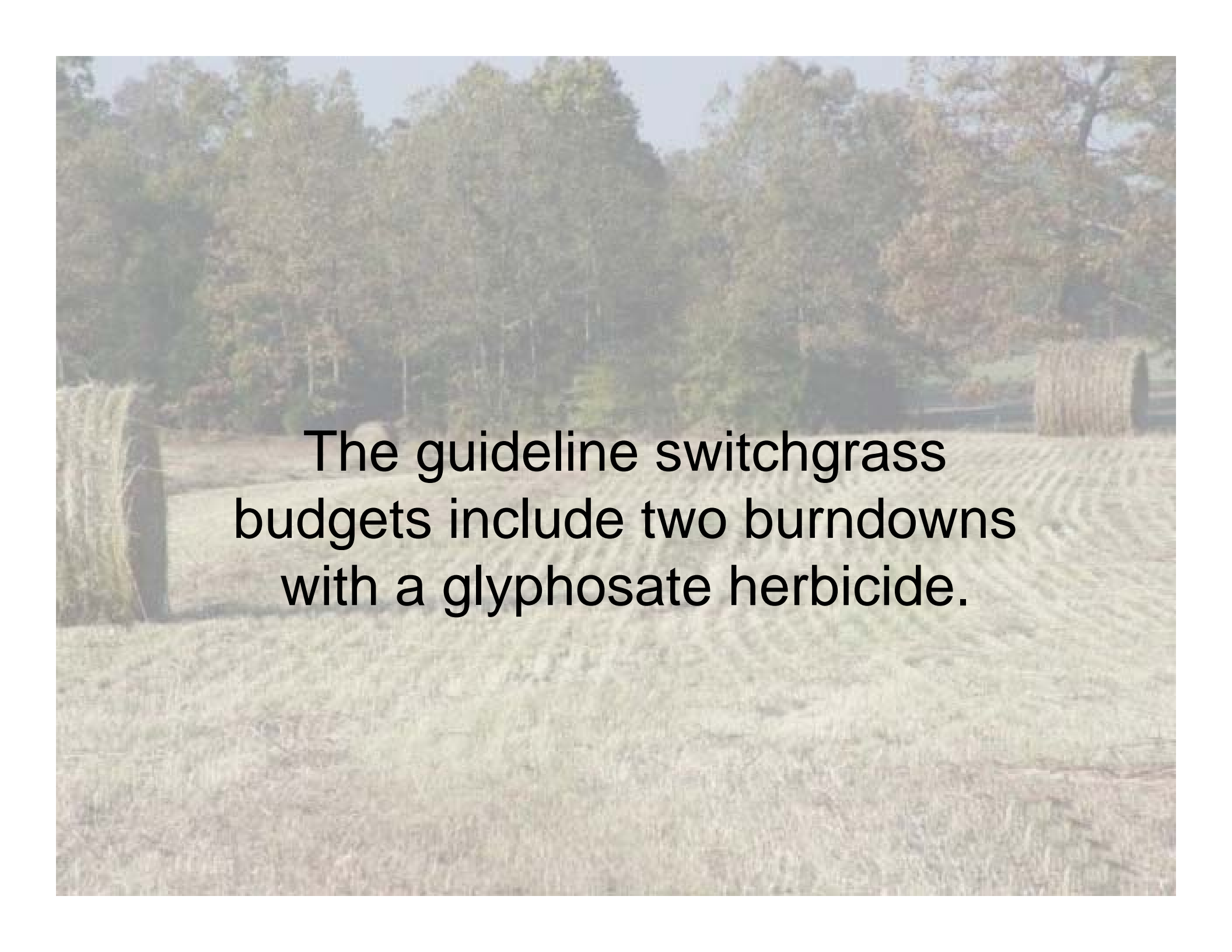
In the establishment year, switchgrass does not compete well with grasses such as fescue, crabgrass, johnsongrass, signalgrass, etc., and broadleaf weeds. Clipping and baling, or herbicides allow sunlight into switchgrass seedlings.

A rural landscape featuring a field of dry grass or hay in the foreground. In the middle ground, there are several large, rectangular hay bales. The background is filled with a dense line of trees with green and some autumn-colored foliage under a clear sky.

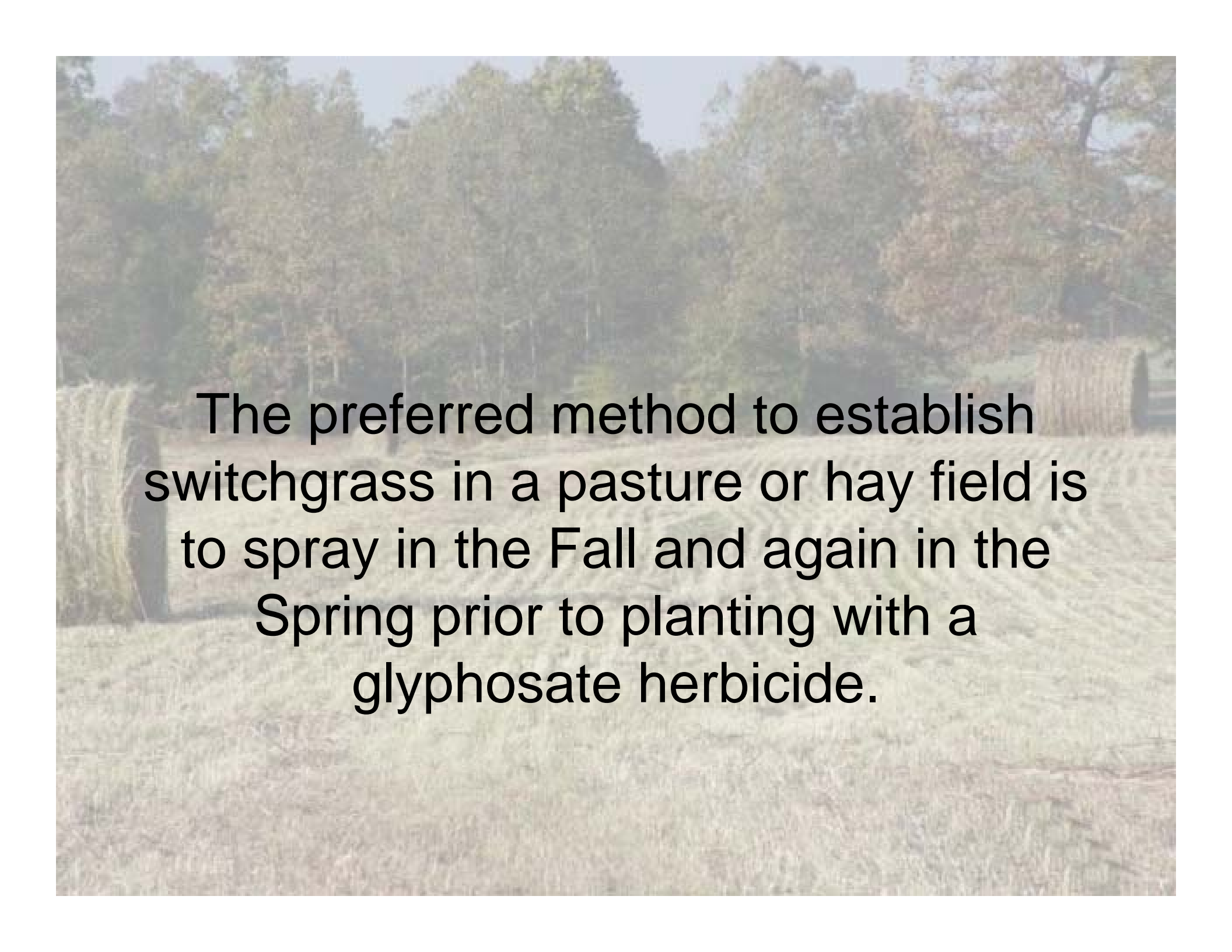
Most often, a glyphosate herbicide (e.g., Roundup®, Gly-4 Plus®) is used to kill existing cover.

New Section 18 and 24 labels are being processed.

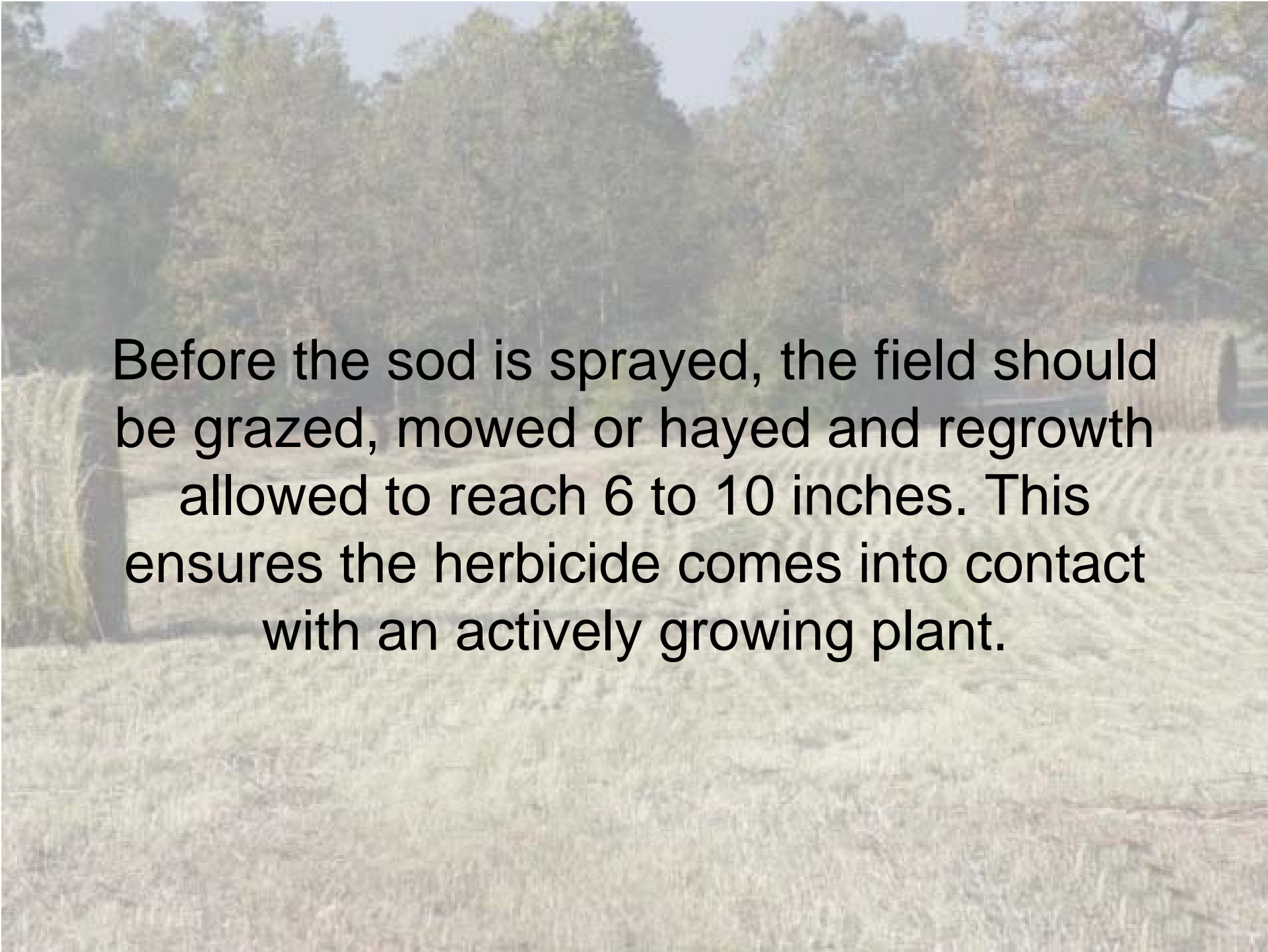
(Atrazine, Paramount, Accent, others.)

A photograph of a rural landscape. In the foreground, there is a field of tall, dry grass, likely switchgrass. In the middle ground, there are several large, rectangular hay bales. The background is filled with a dense line of trees, some with green leaves and some with autumn-colored foliage. The sky is a pale, overcast blue.


The guideline switchgrass budgets include two burndowns with a glyphosate herbicide.

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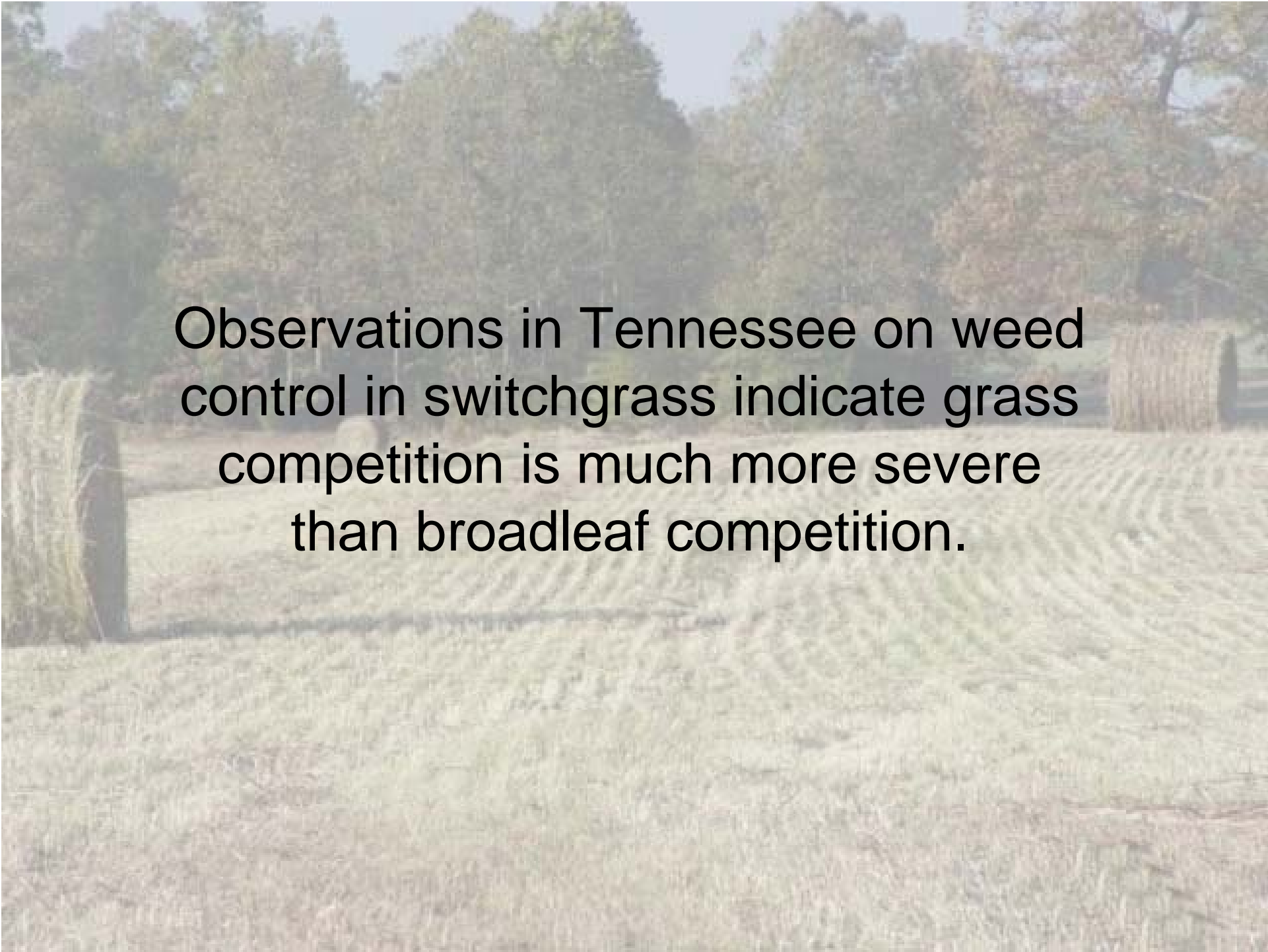
The preferred method to establish switchgrass in a pasture or hay field is to spray in the Fall and again in the Spring prior to planting with a glyphosate herbicide.

A photograph of a rural farm scene. In the foreground, there is a large, rectangular hay bale. To the right, a wooden fence runs across the frame. The background is filled with a dense line of trees, some with green leaves and others with autumn-colored foliage. The sky is a pale, overcast blue. The overall scene is slightly hazy, suggesting a misty or overcast day.

Before the sod is sprayed, the field should be grazed, mowed or hayed and regrowth allowed to reach 6 to 10 inches. This ensures the herbicide comes into contact with an actively growing plant.



Cimarron®, formerly named Ally® from Dupont™, is labeled for post-emergence application on switchgrass for control of broadleaf weeds. Efforts are currently being made to gain regulatory approval for the use of an additional herbicide for grass suppression in Tennessee.

A photograph of a rural landscape in Tennessee. The foreground is dominated by a field of switchgrass, which appears to be a mix of green and yellowish-brown, suggesting it might be a pasture or a field being managed for hay. A wooden fence runs across the middle ground, with several large, rectangular hay bales stacked on either side. In the background, there is a large, dark-colored barn or shed, partially obscured by a dense line of trees with green and some autumn-colored foliage. The sky is a pale, overcast blue.

Observations in Tennessee on weed control in switchgrass indicate grass competition is much more severe than broadleaf competition.



**UTBI**

***Biofuels Initiative***