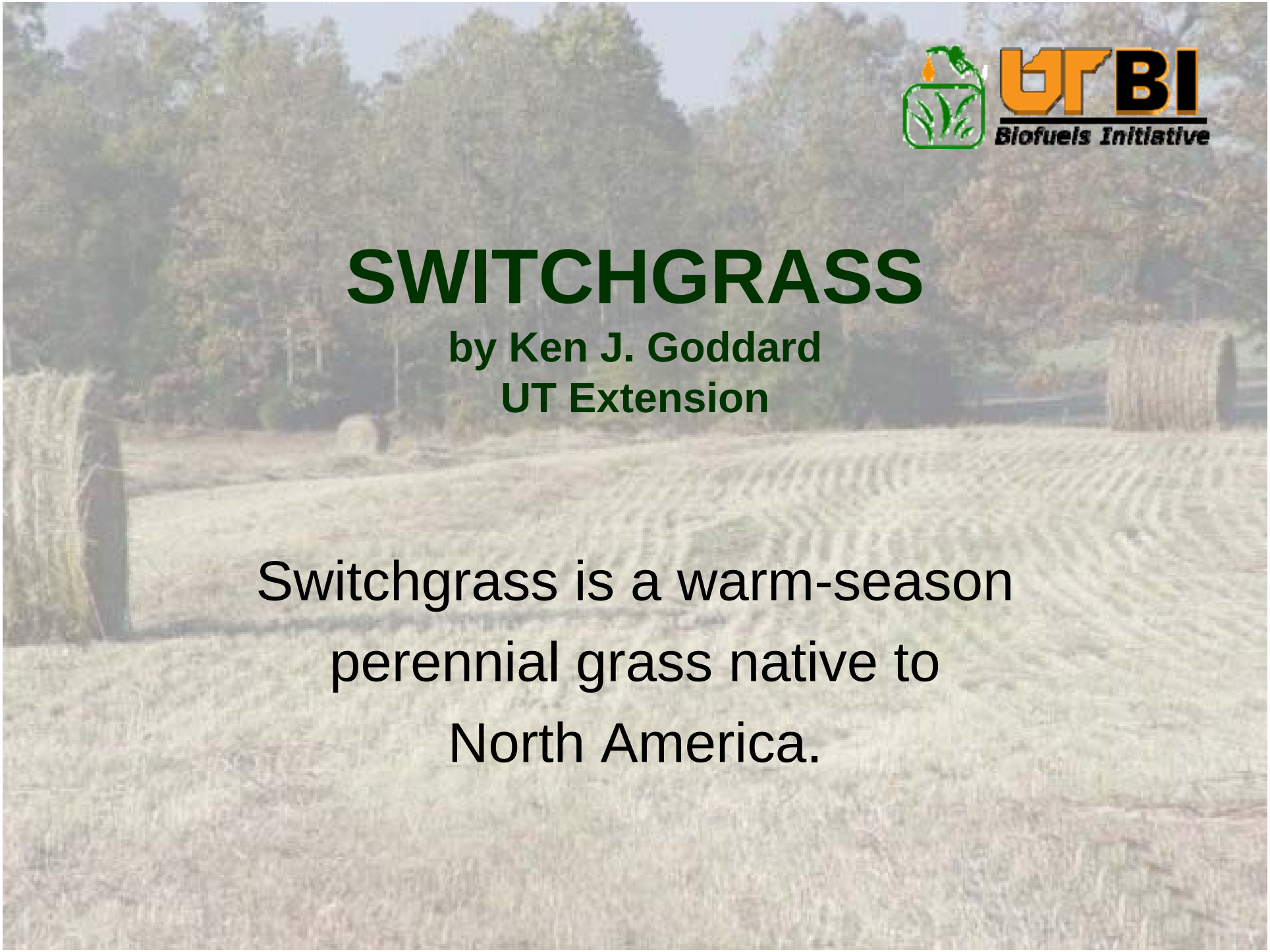
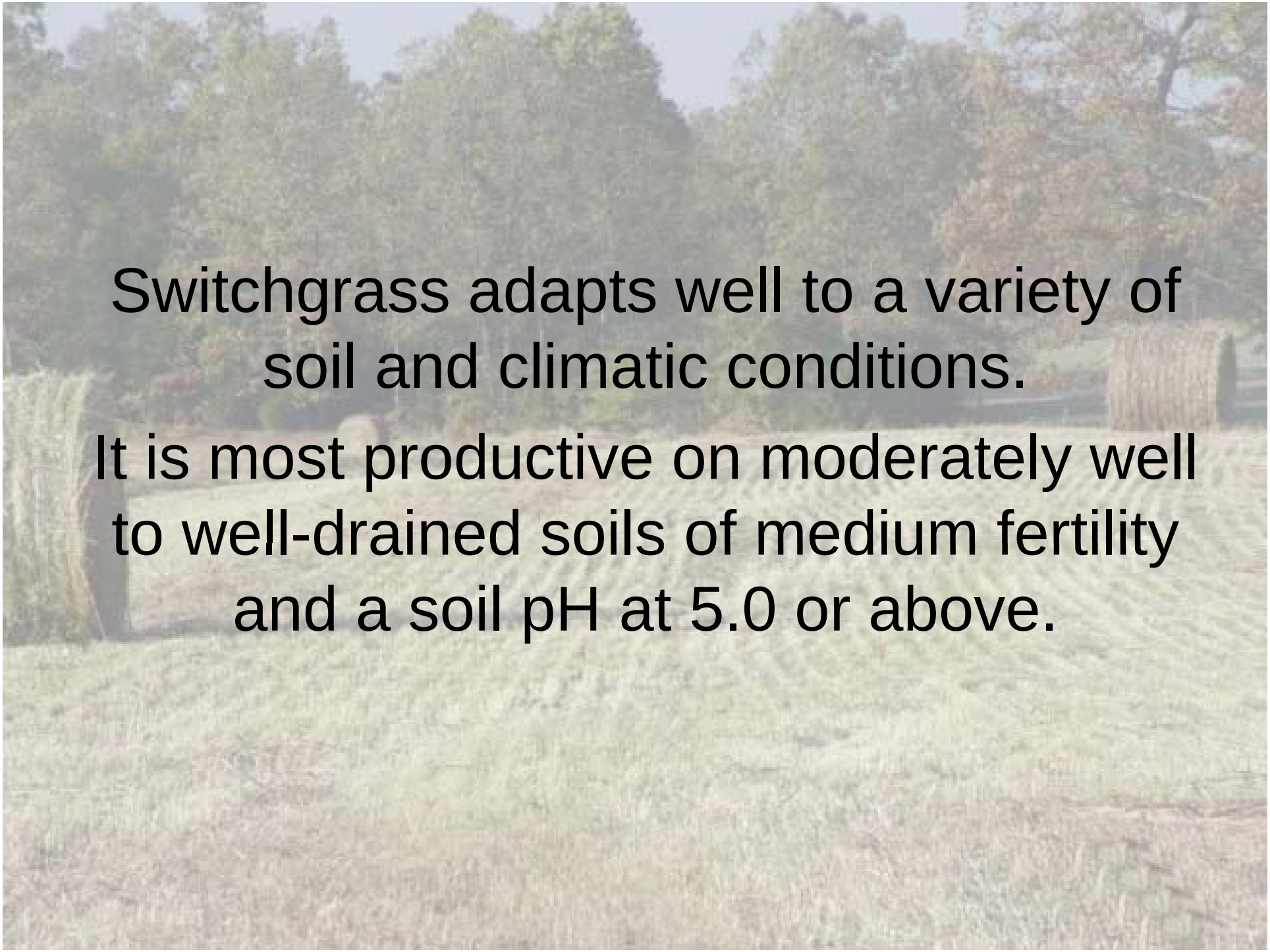


SWITCHGRASS

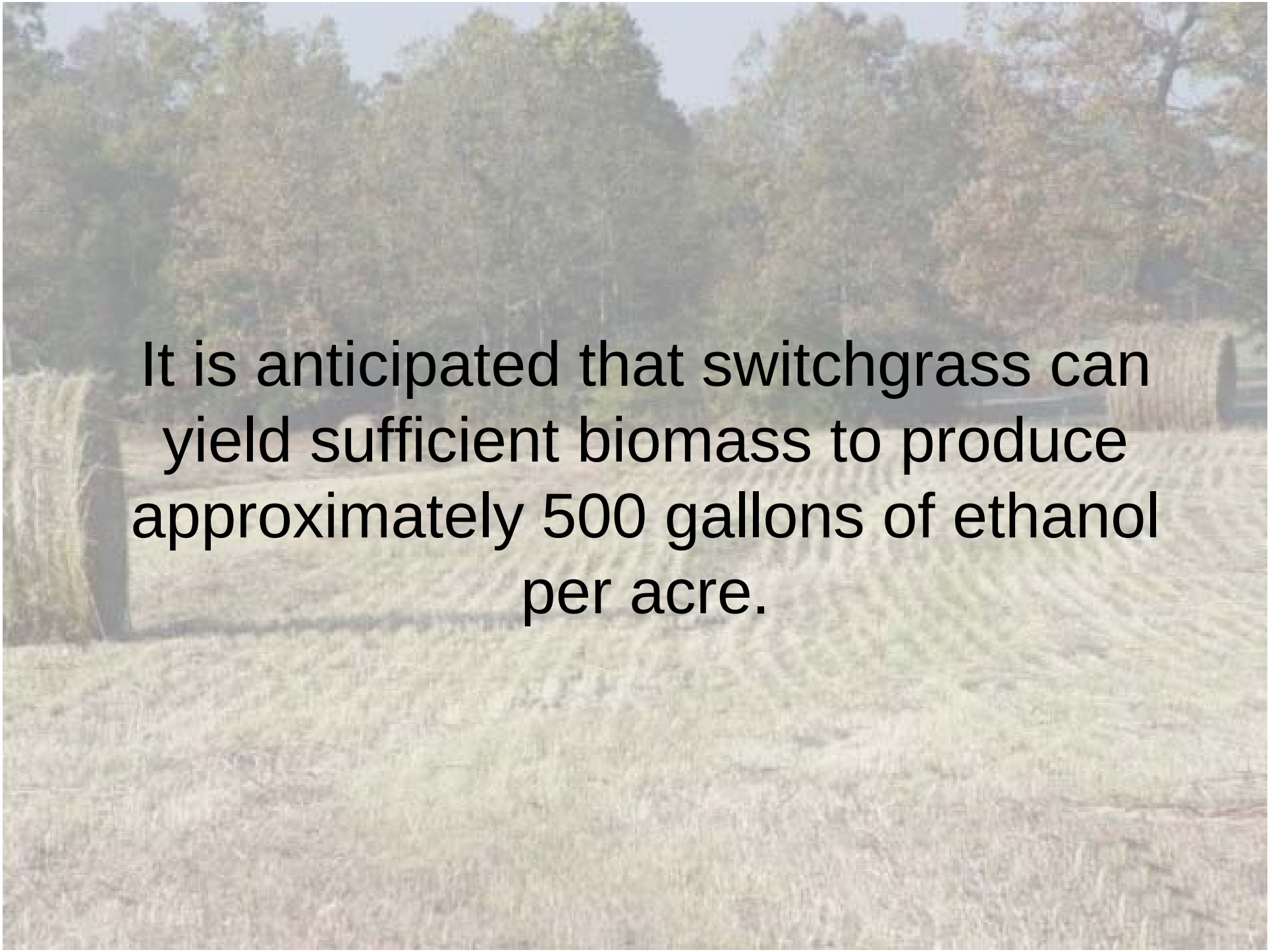
by Ken J. Goddard
UT Extension

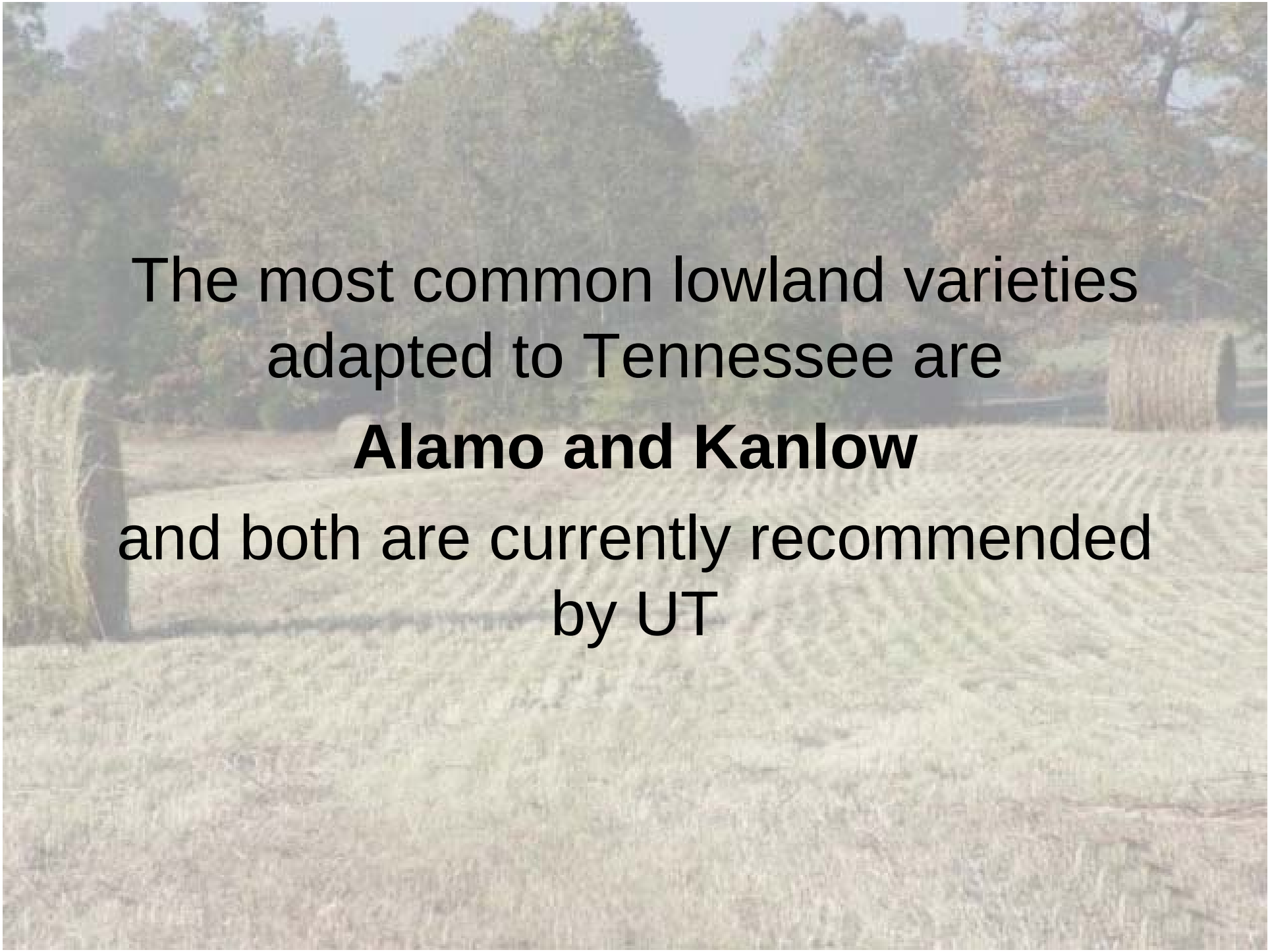
Switchgrass is a warm-season perennial grass native to North America.



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.

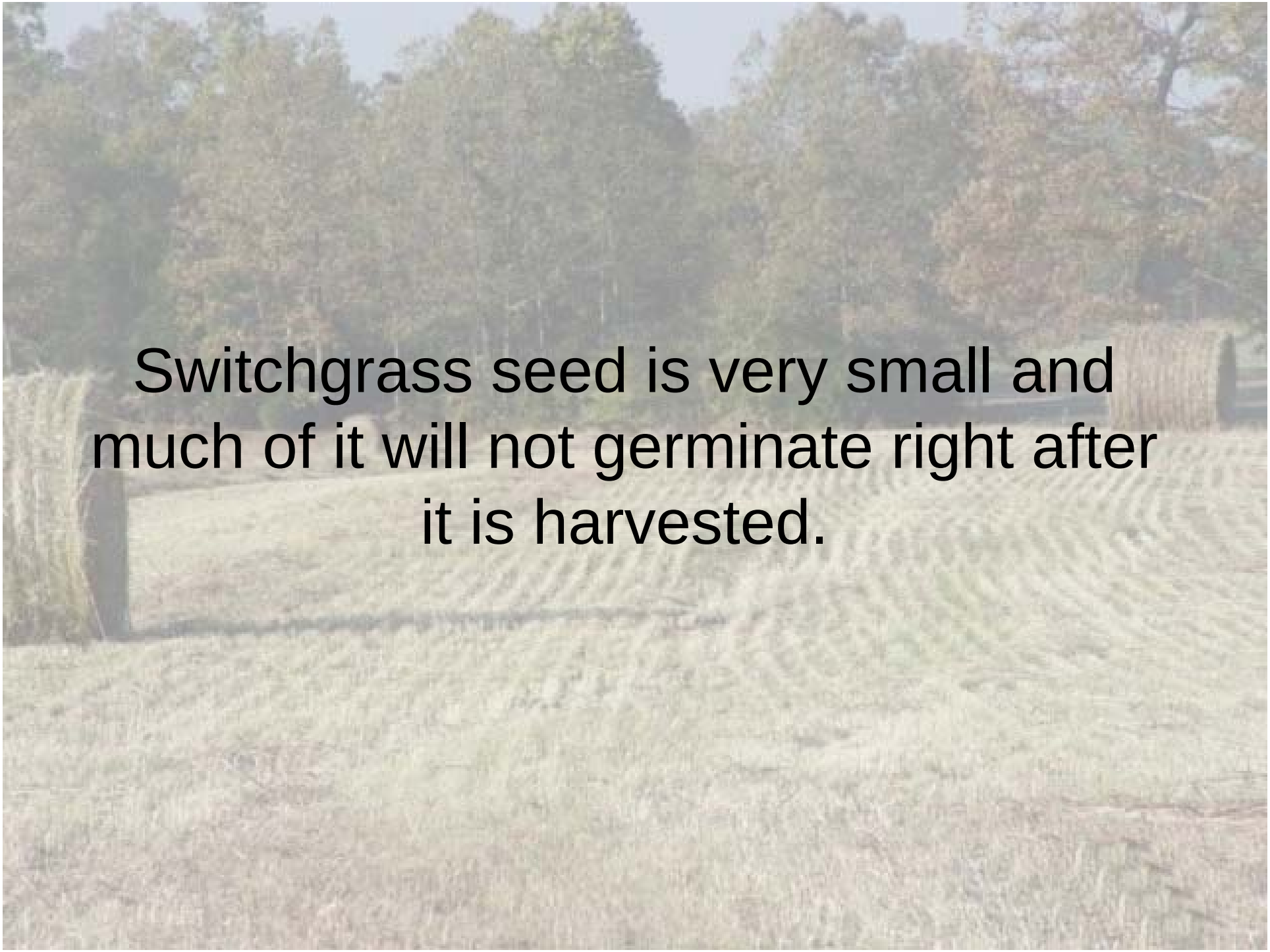

It is anticipated that switchgrass can yield sufficient biomass to produce approximately 500 gallons of ethanol per acre.



The most common lowland varieties adapted to Tennessee are

Alamo and Kanlow

and both are currently recommended by UT



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

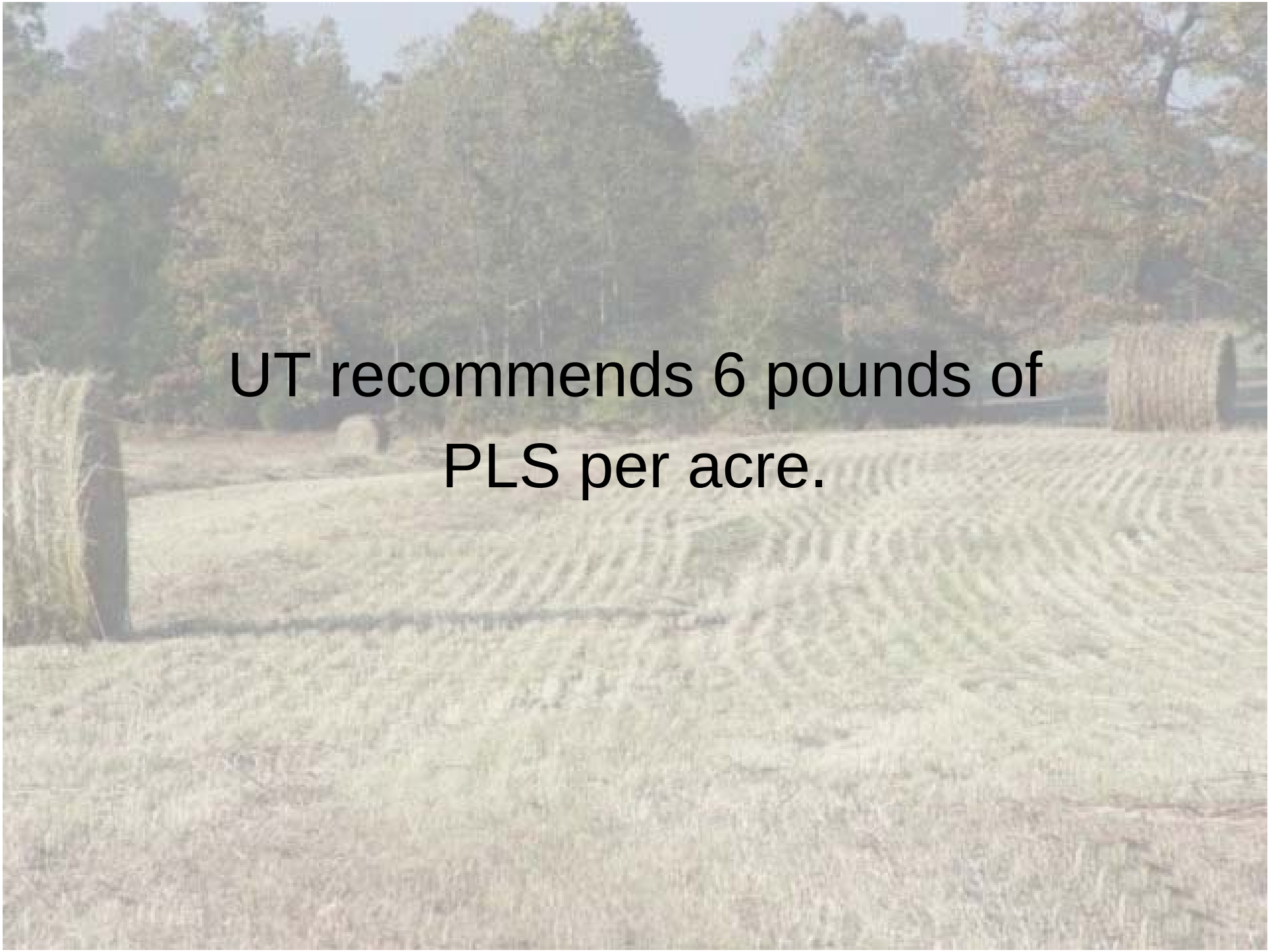
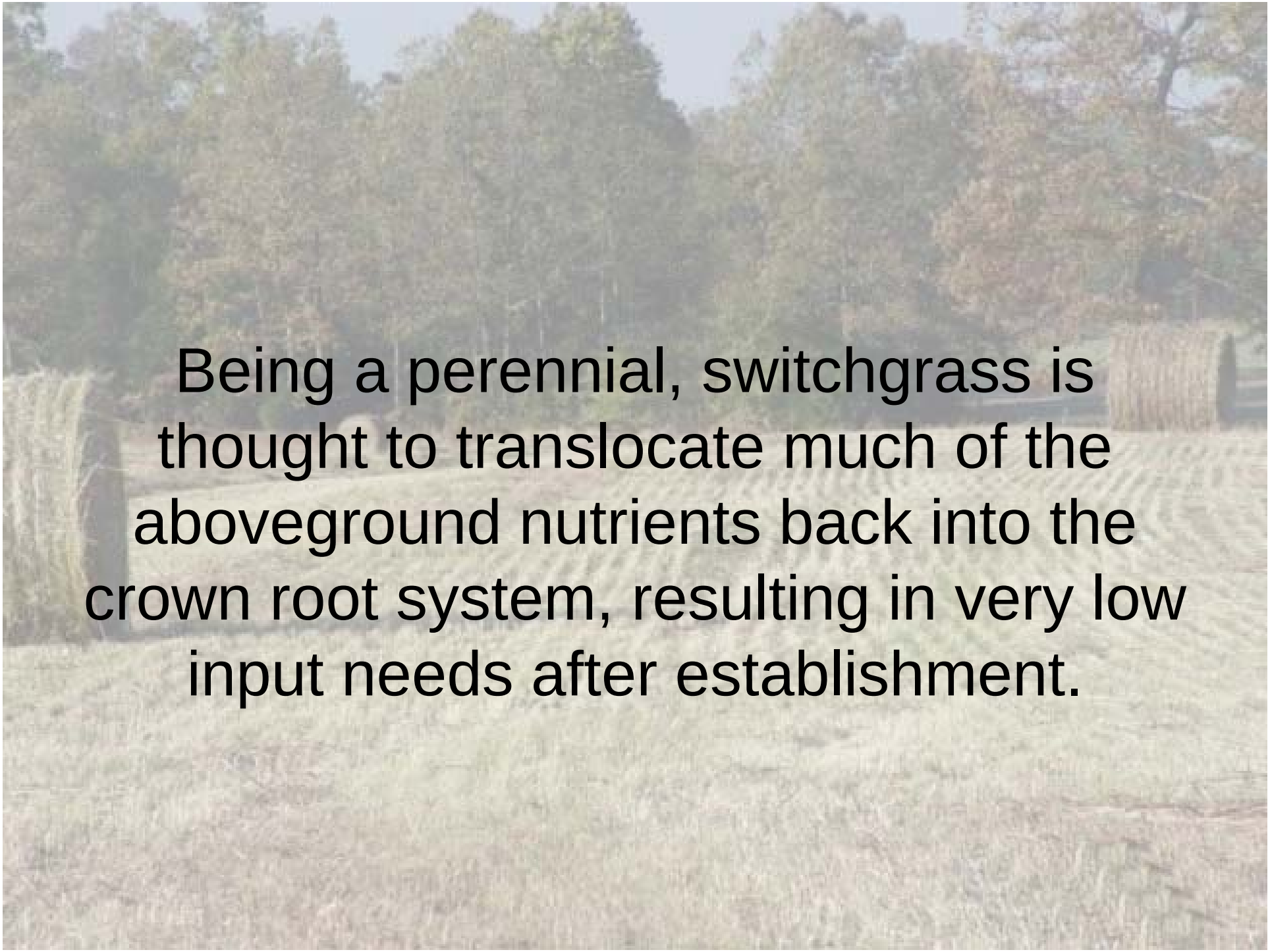
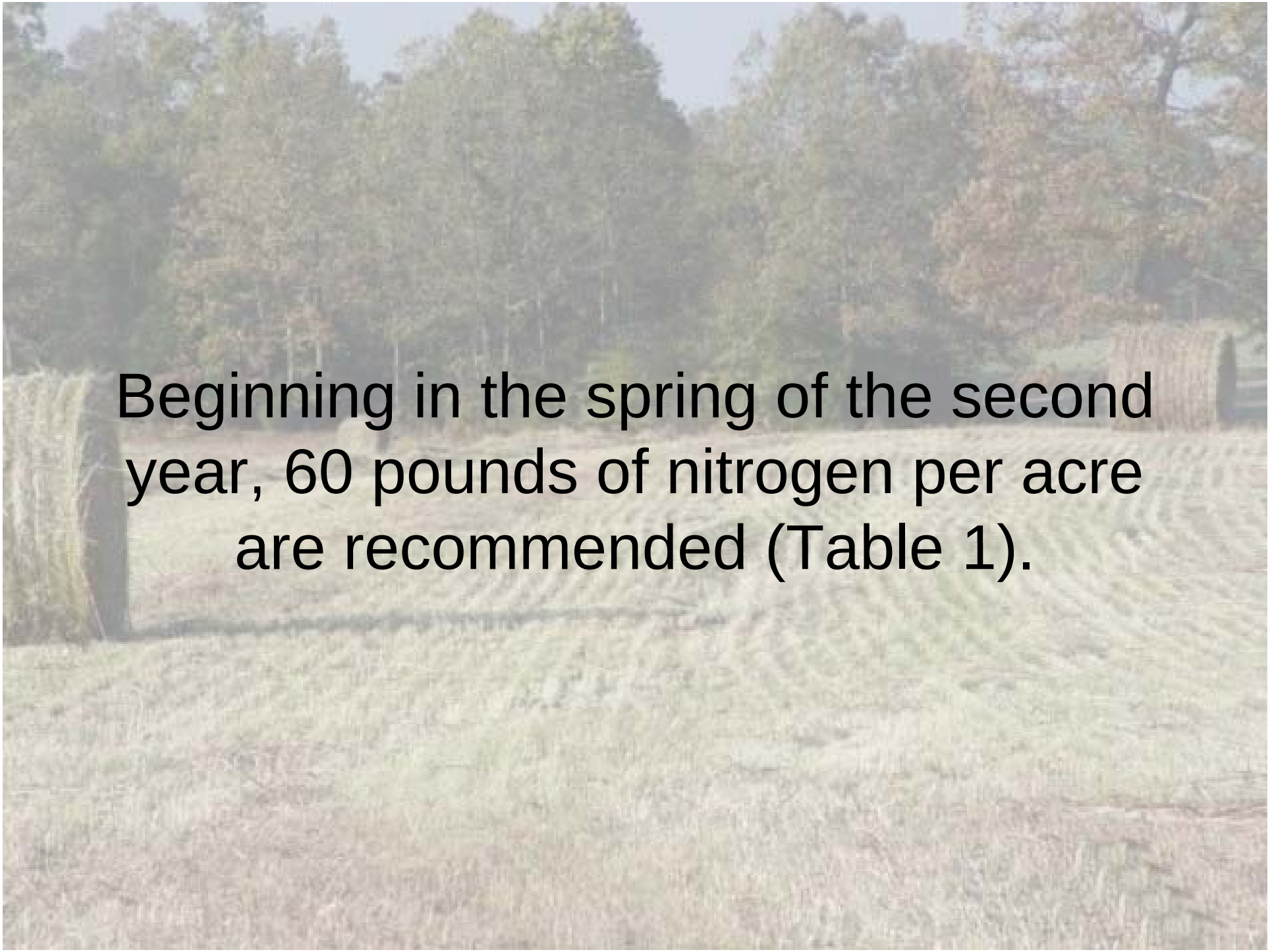

UT recommends 6 pounds of
PLS per acre.

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**							


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.

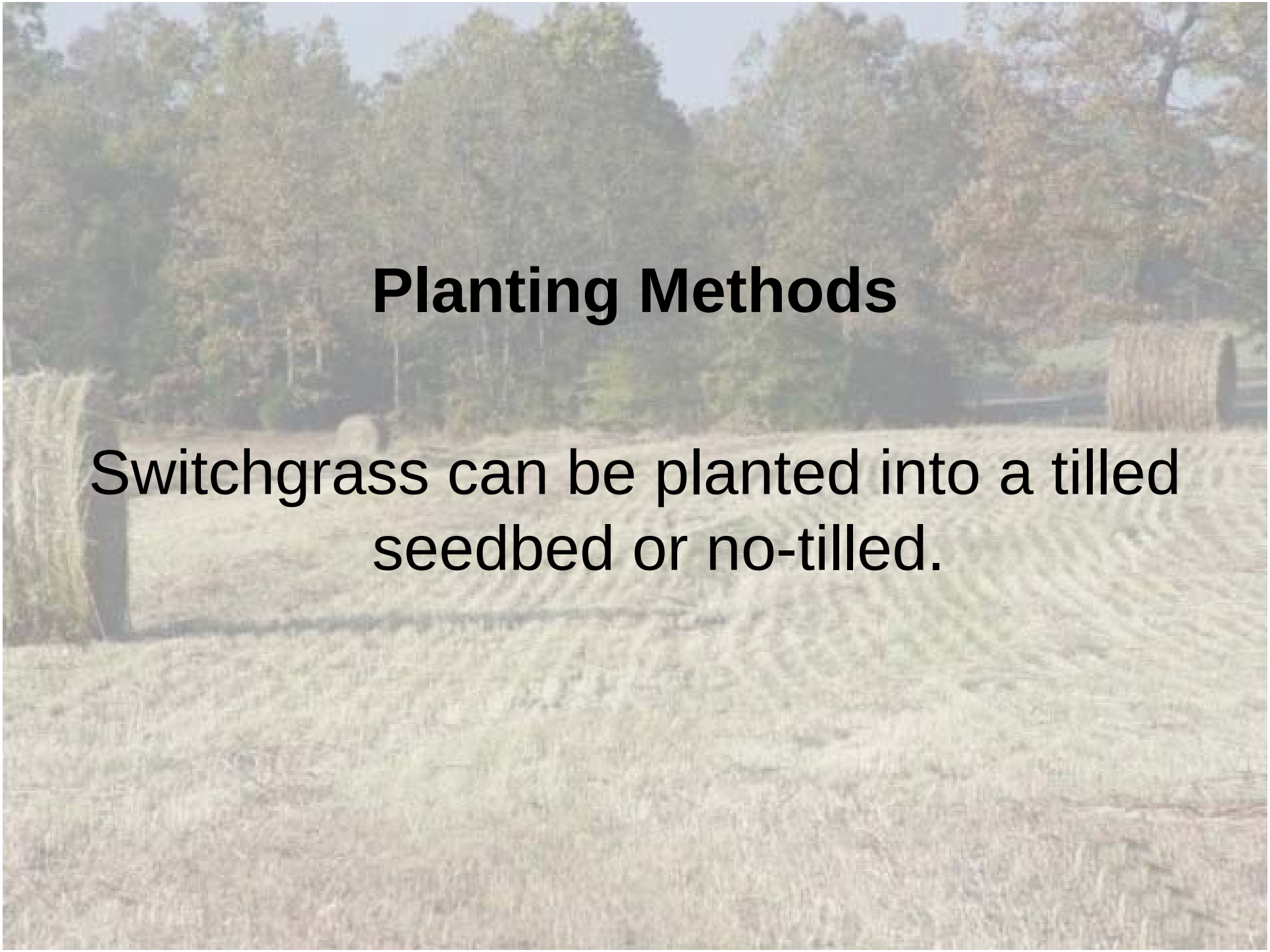
In the first year, **do not** apply nitrogen. It increases competition from annual grasses and broadleaf weeds.



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

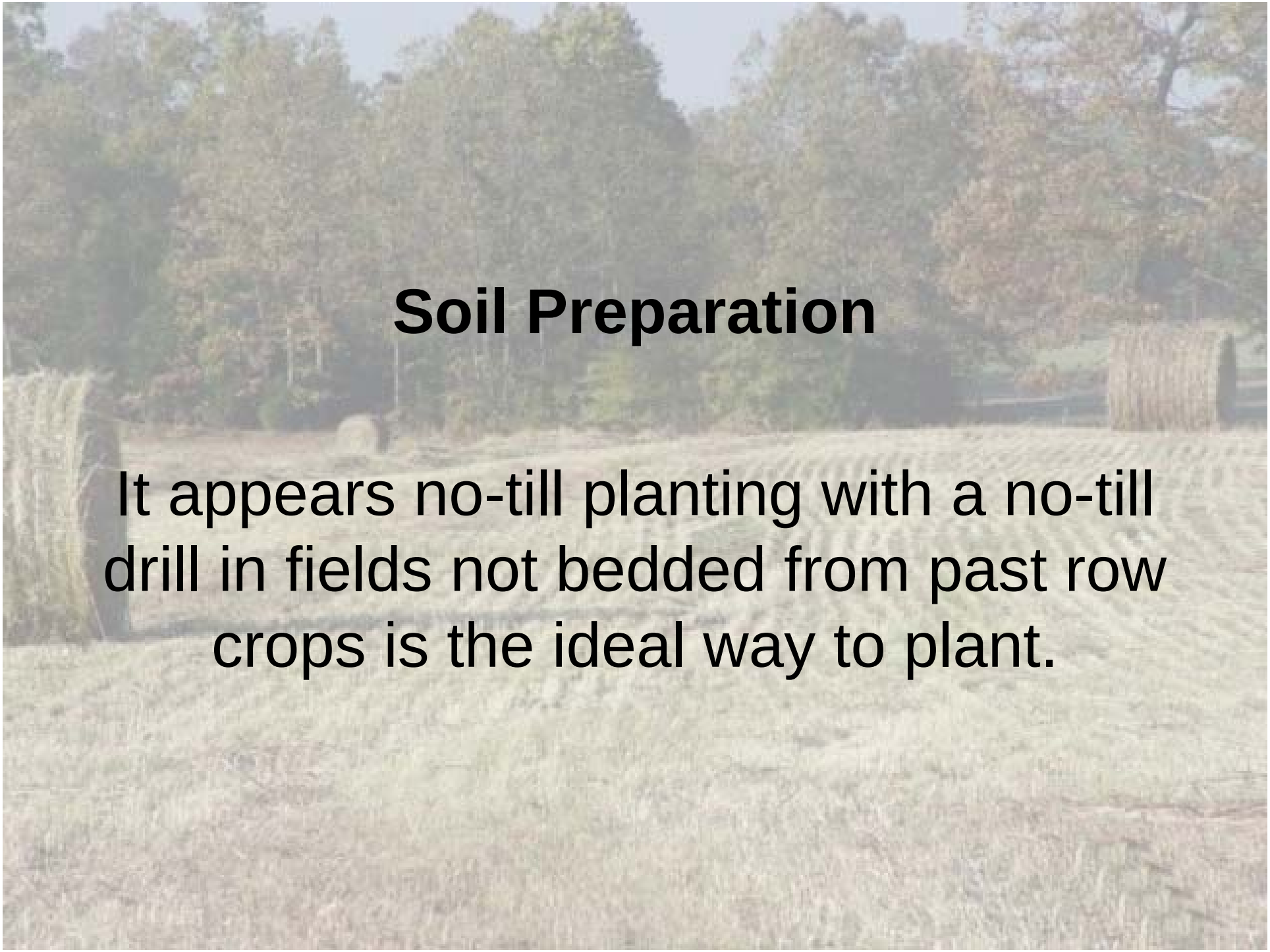
Planting Date

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



Planting Methods

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

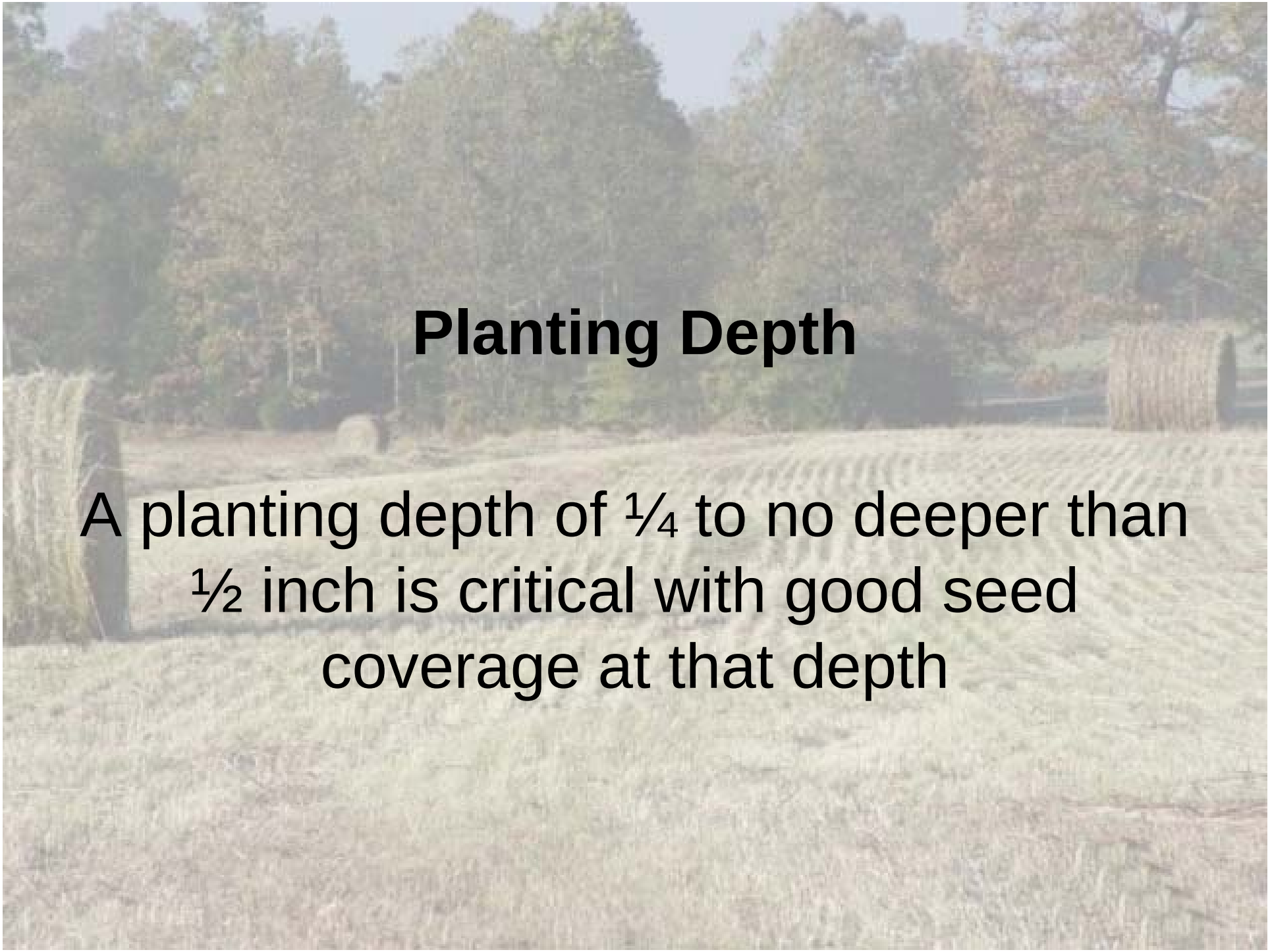


Soil Preparation

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

Soil Moisture

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



Planting Depth

A planting depth of ¼ to no deeper than ½ 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.

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.

- 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 see and firm the soil for good seed-soil contact.

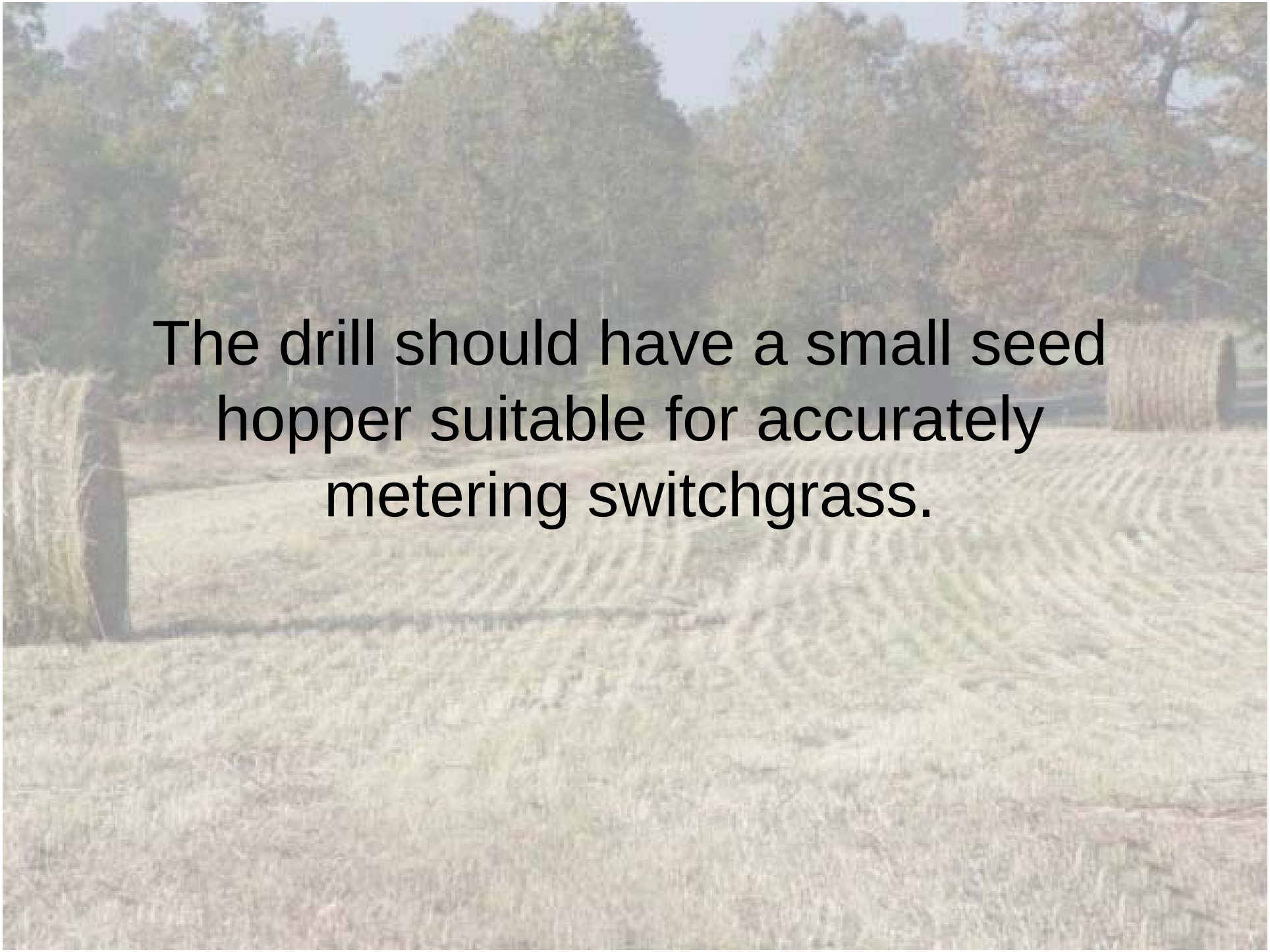
In absence of coulters, off-set double disk openers have worked very well.

Lime and Fertilizer

Limestone, phosphate and potash applications should be based on a soil test.

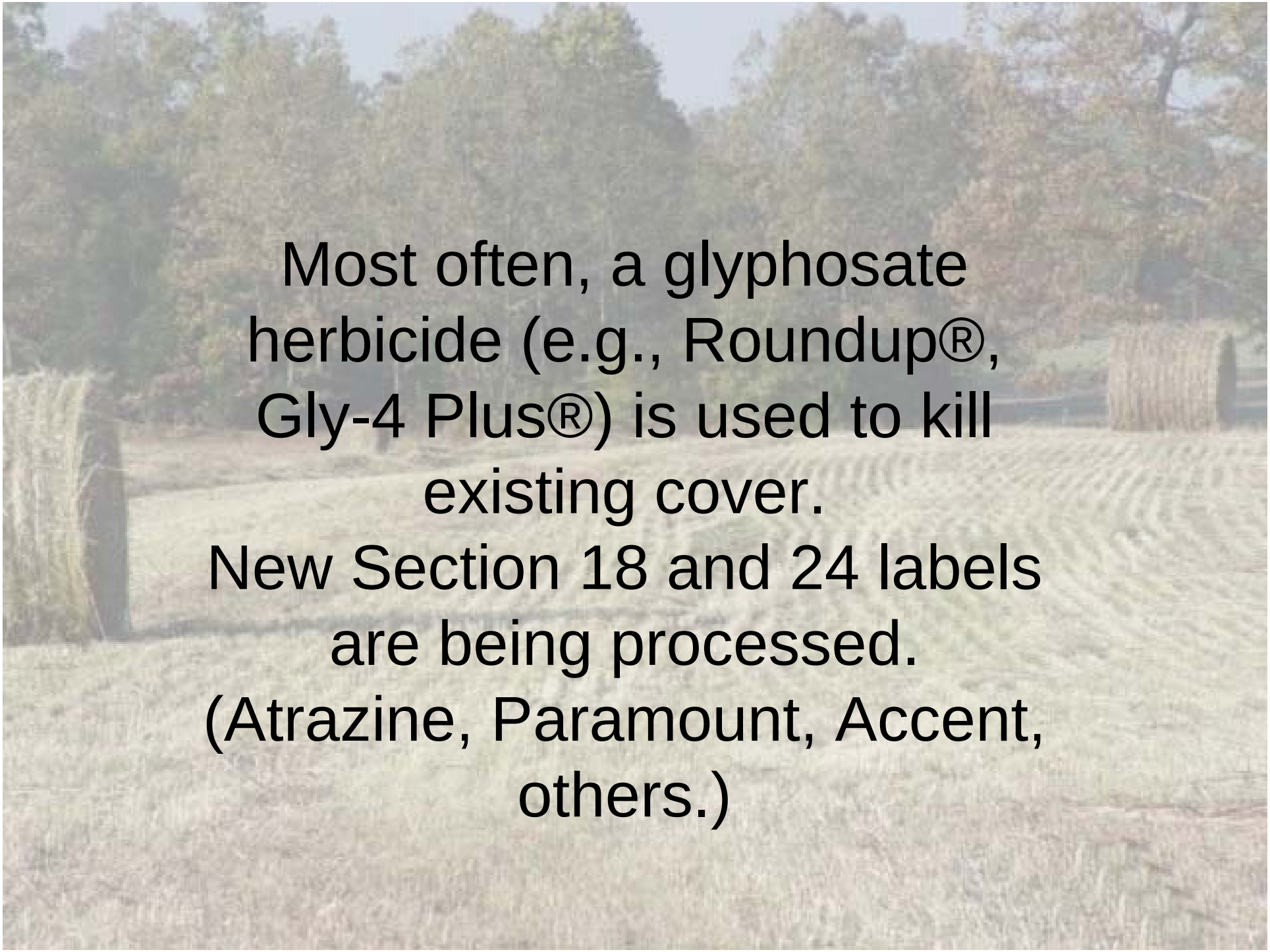
UT cellulosic fertility recommendations are below.

	Nitrogen	Phosphate (P_2O_5)			Potash (K_2O)		
	Soil Test Levels*						
Practice	**(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**							


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

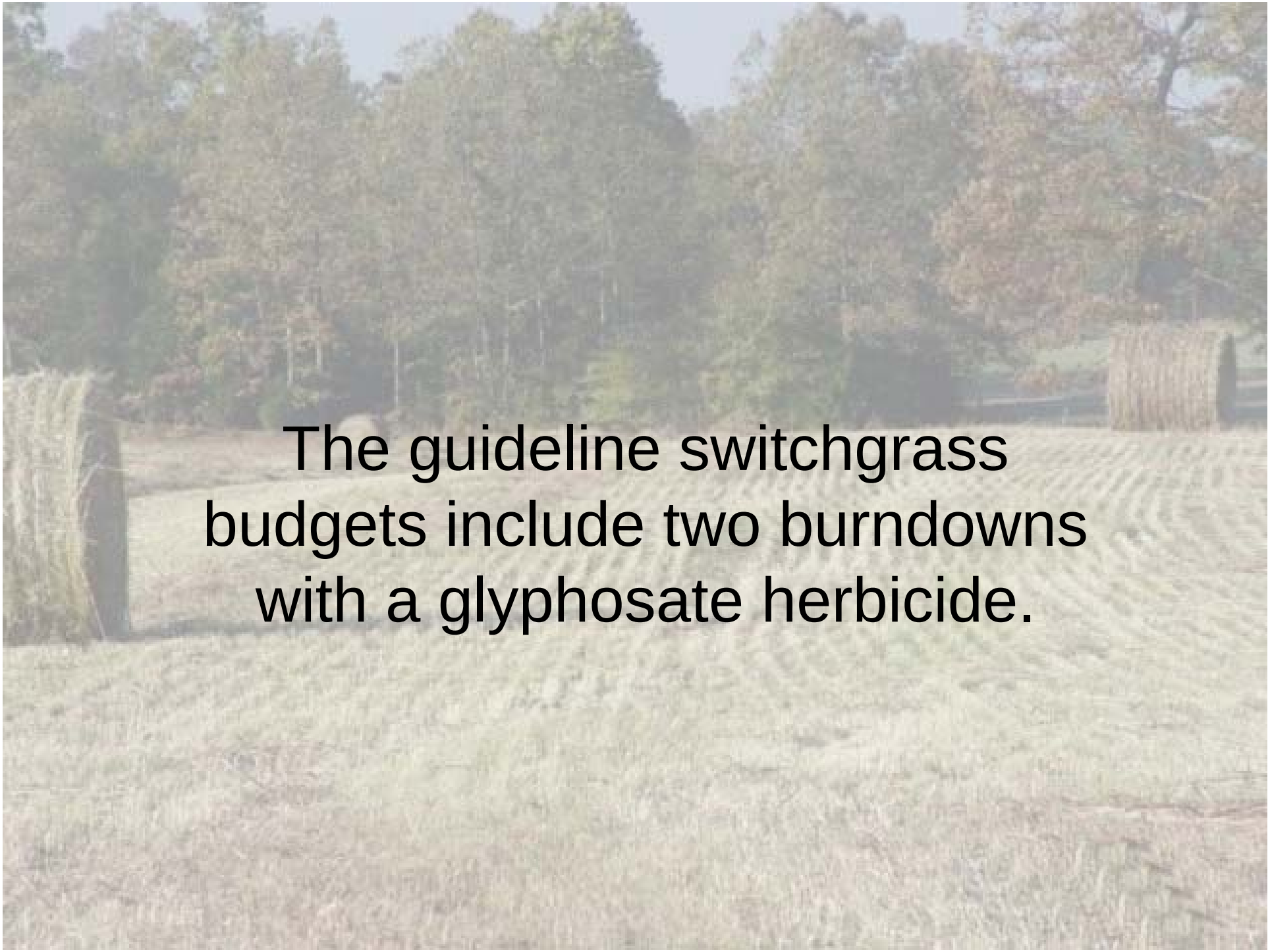
Weed Control

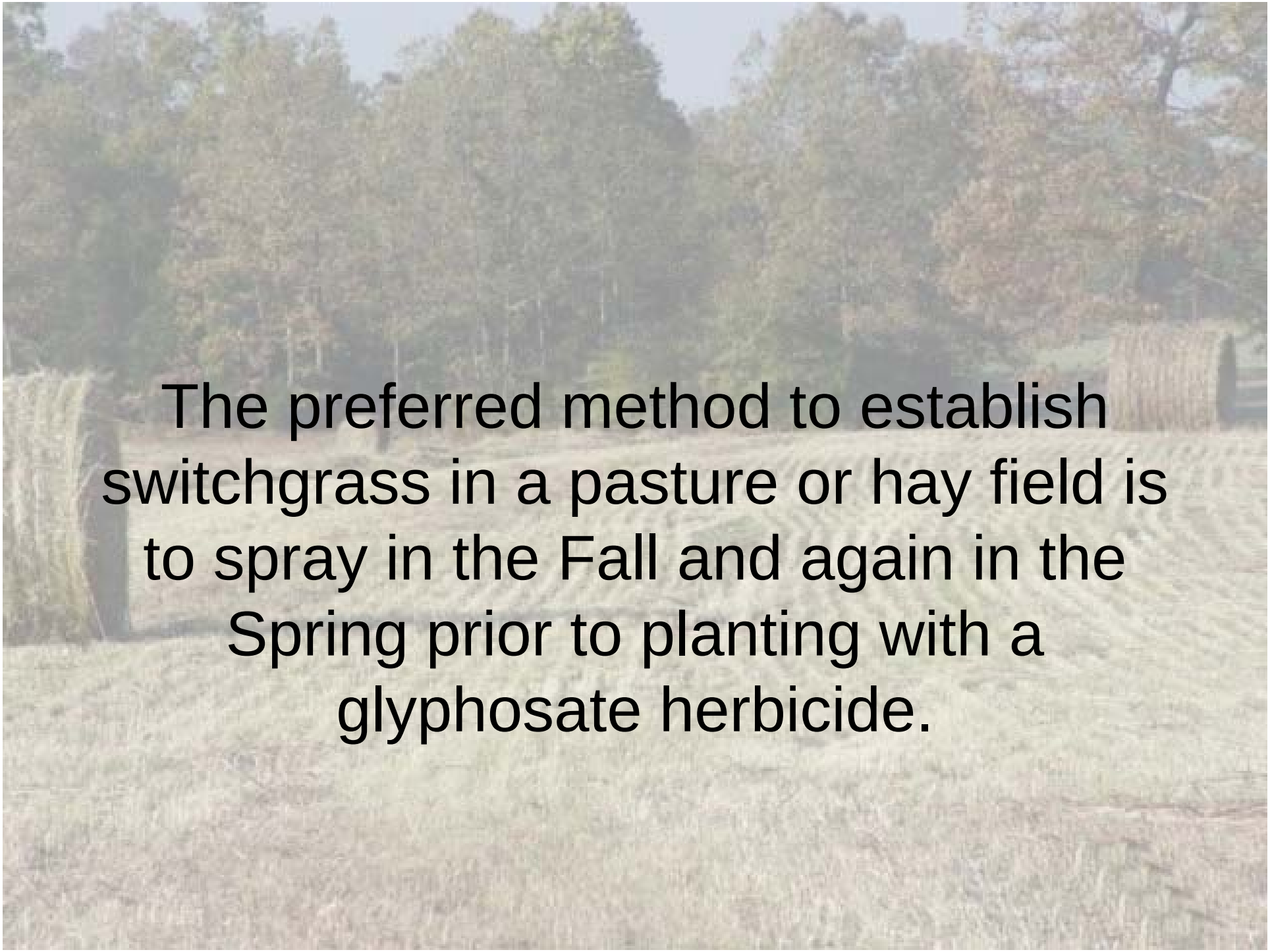
In the establishment year, switchgrass does not compete well with grasses such as fescue, crabgrass, johnsongrass, signalgrass, etc., and broadleaf weeds. Clipping and baling, or herbicides allow sunlight into switchgrass seedlings.

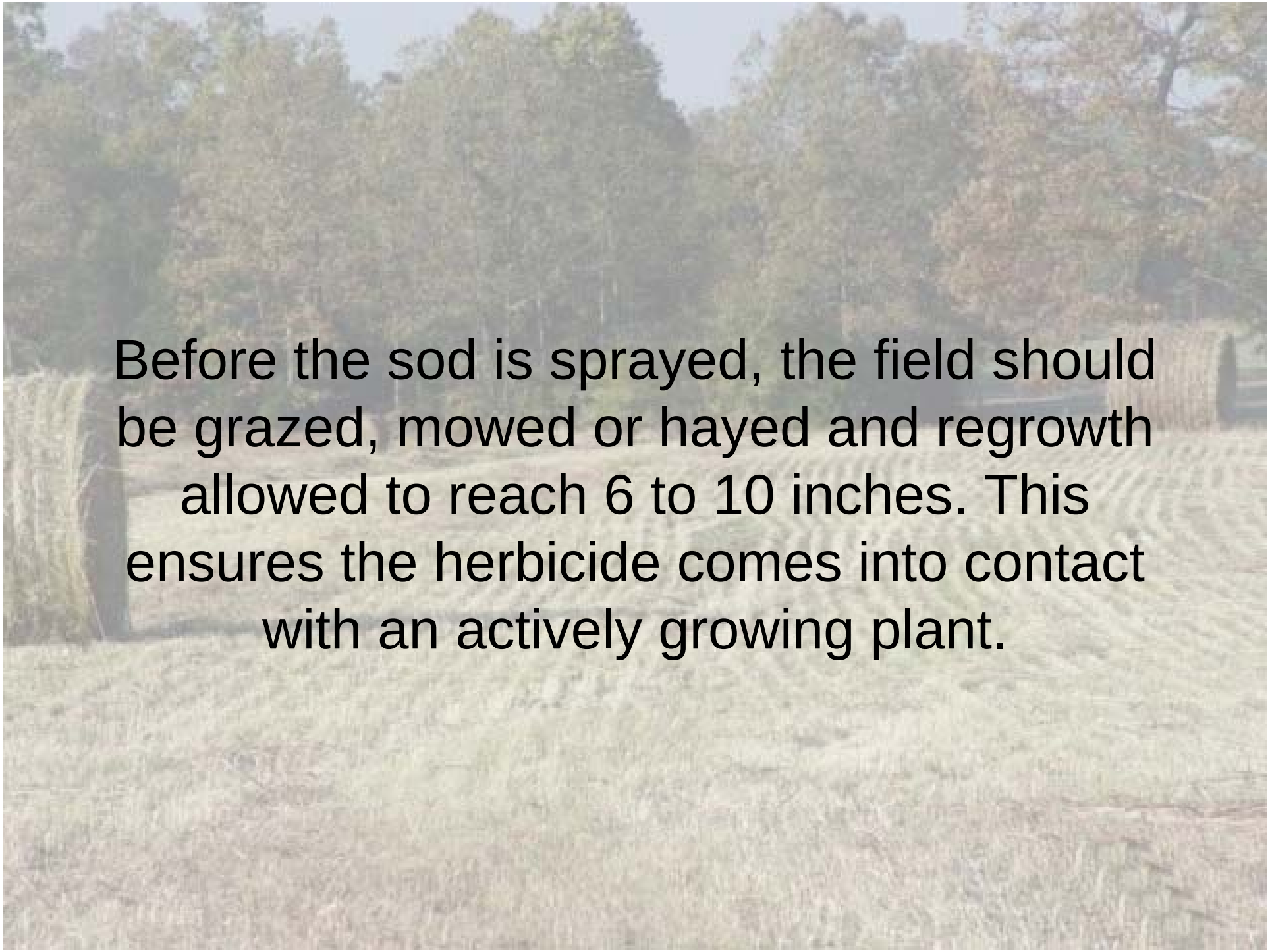


Most often, a glyphosate herbicide (e.g., Roundup®, Gly-4 Plus®) is used to kill existing cover.

New Section 18 and 24 labels are being processed. (Atrazine, Paramount, Accent, others.)

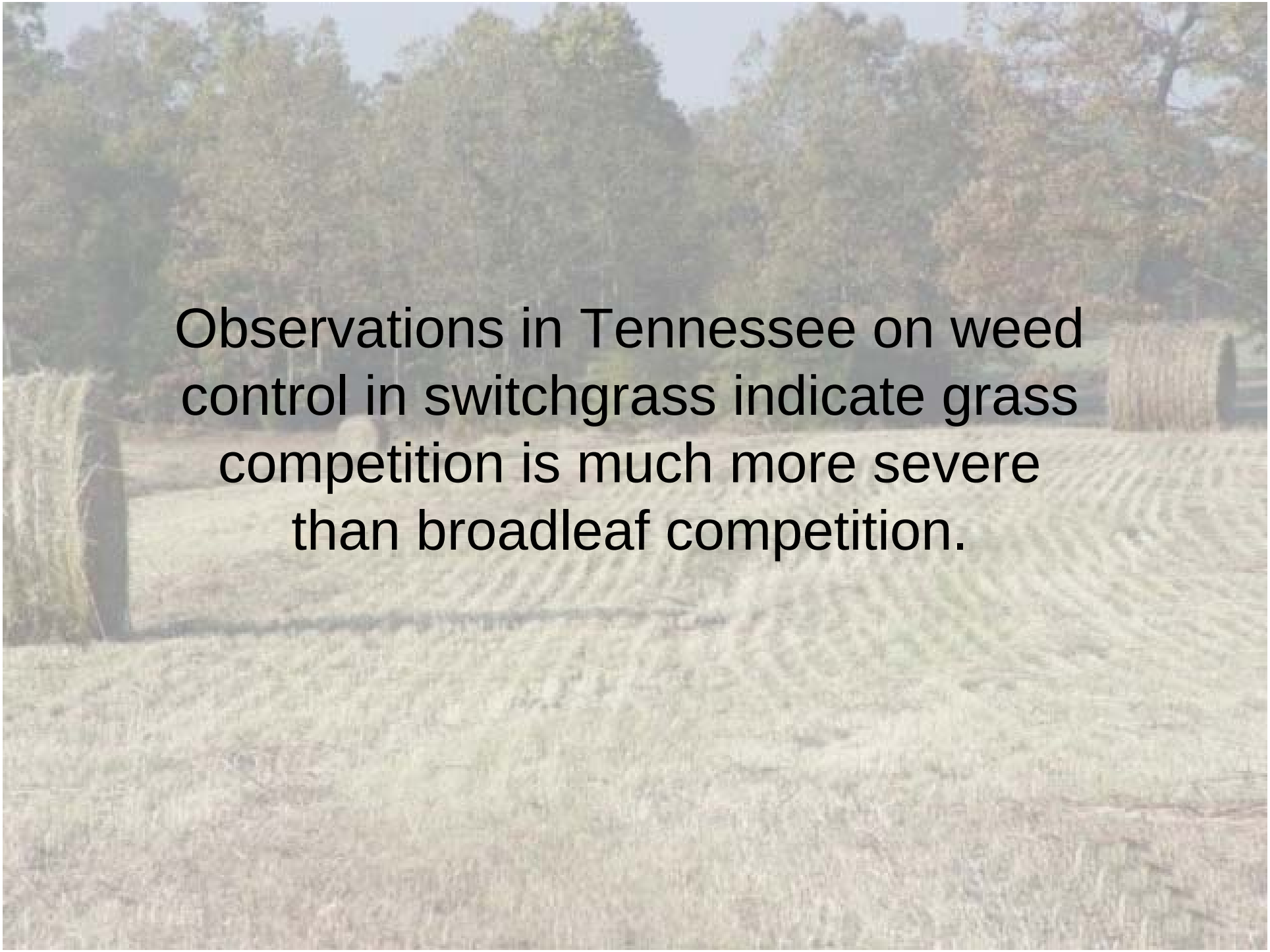

The guideline switchgrass budgets include two burndowns with a glyphosate herbicide.


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.



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.



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