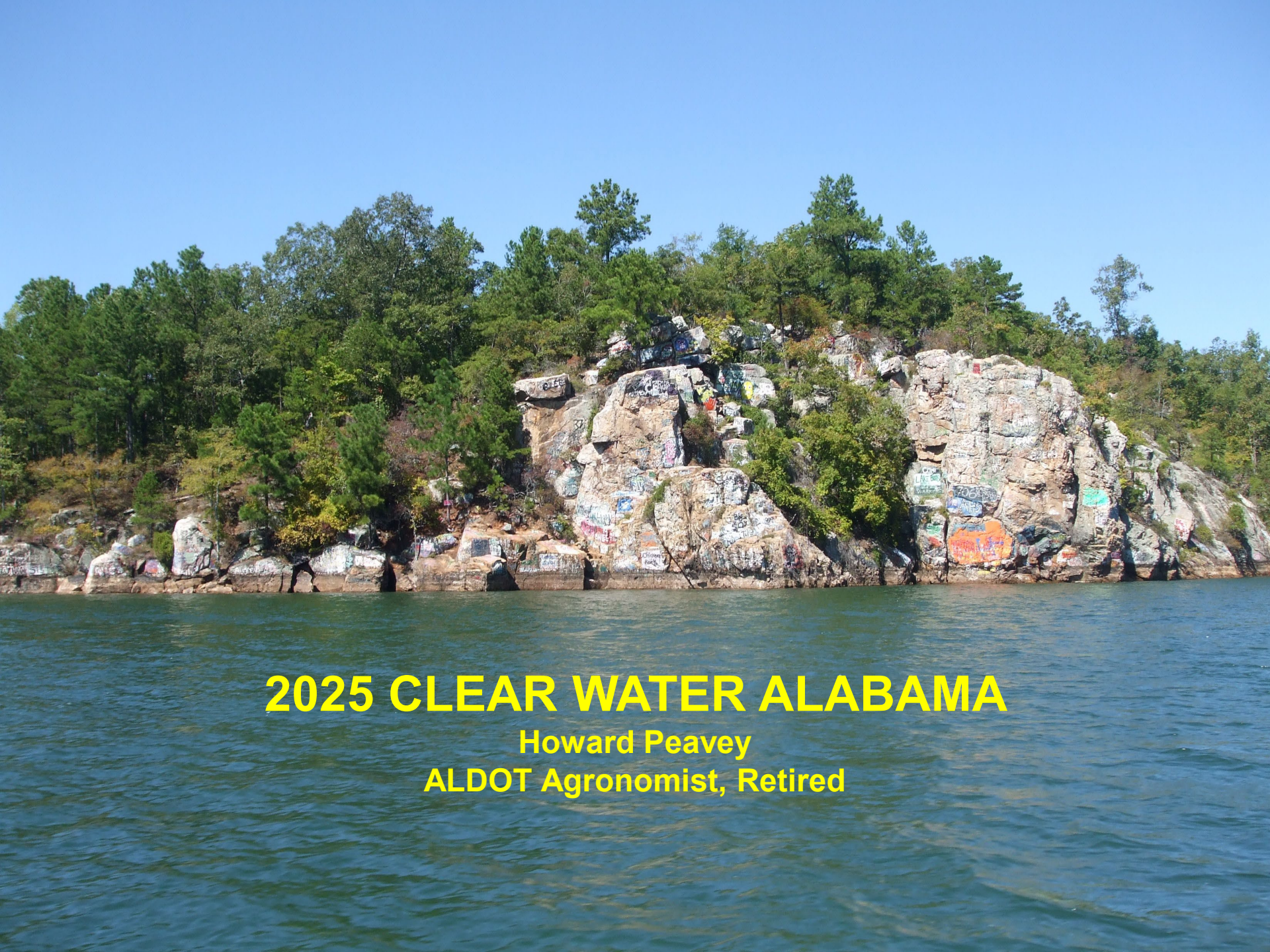


2025 CLEAR WATER ALABAMA

Howard Peavey
ALDOT Agronomist, Retired

ALABAMA IS SURPRISING IN ITS BIOLOGICAL DIVERSITY

- Alabama ranks 5th in the nation in number of plant and animal species.
- Alabama ranks 1st in states east of the Mississippi in number of plant and animal species.
- According to the Nature Conservancy, Alabama tops the nation in these aquatic categories:
  - Freshwater fishes – 332 different kinds account for 27% of all fish species in North America
  - Freshwater mussels – 180 kinds account for 59% of all mussel species in North America
  - Freshwater snails – 202 kinds account for 28% of all snail species in North America
  - Crayfish – 85 kinds account for 22% of all crayfish species in North America
  - Turtles – 27 kinds account for 57% of all turtle species in North America.

ALABAMA IS SURPRISING IN ITS GEOGRAPHICAL DIVERSITY

- "Alabama's biological diversity is the product of its geographical diversity." - Jim Lacefield, author of ***Lost Worlds in Alabama.***"
- "Alabama has practically every landscape known in North America aside from deserts and alpine tundra. From pitcher plant bogs and coastal marshes, to ephemeral streams, brooks, creeks, rivers, ponds, lakes and reservoirs, mountains, glades, caves, we have it all," – Stuart McGregor, Geographical Survey of Alabama.
- "Along with our landscapes, we are blessed with the presence of 5 major watersheds within the boundaries of the state," – Stuart McGregor, Geographical Survey of Alabama.

WHY IS BIODIVERSITY IMPORTANT?

- **"Seen or unseen, Alabama's thousands of native species play important roles in the ecosystems sustaining the state's economy and culture. Impaired ecosystems offer us little, and when they collapse there is loss of livelihood, property and sometimes life. Consider flooding in overdeveloped watersheds or the trauma in coastal communities when fisheries collapse. When we lose biodiversity, we lose opportunity and ecological security. Ultimately, biodiversity protection is people protection." – Dr. Scot Ducan, author of *Southern Wonder: Alabama's Surprising Biodiversity*.**

ALDOT'S MISSION

- To provide and maintain safe travelways throughout the State (safe for travelers and workers).

- ALDOT'S vegetation management program is designed to enhance travelway safety as well as the protection of the travelway, travelway apertanances, and adjoining Rights-of-Way.
  - Low growing stoloniferous vegetation is the desired target vegetation.
    - Less line-of-sight interference
    - Soil stability

ALDOT'S VEGETATION CHOICES

ALDOT planting zone guide

ZONE 1		ZONE 2		ZONE 3	
Blount	Lauderdale	Autauga	Montgomery	Baldwin	Marengo
Calhoun	Lawrence	Bibb	Perry	Barbour	Mobile
Cherokee	Limestone	Bullock	Pickens	Butler	Monroe
Clay	Madison	Chambers	Russell	Choctaw	Pike
Cleburne	Marion	Chilton	Sumter	Clarke	Washington
Colbert	Marshall	Coosa	Tallapoosa	Coffee	Wilcox
Cullman	Morgan	Dallas	Tuscaloosa	Conecuh	
Dekalb	Randolph	Elmore		Covington	
Etowah	Shelby	Greene		Crenshaw	
Fayette	St. Clair	Hale		Dale	
Franklin	Talladega	Lee		Escambia	
Jackson	Walker	Lowndes		Geneva	
Jefferson	Winston	Macon		Henry	
Lamar				Houston	

ALDOT'S VEGETATION CHOICES

ZONE 1 - AREAS SUBJECT TO FREQUENT MOWING
REQUIRED POUNDS PER ACRE {KILOGRAMS PER HECTARE} OF PURE LIVE SEED

Date of Planting	Aug. 16 to Feb. 29		Mar. 1 to May 15	May 16 to August 15
Annual Ryegrass	10 {11}	25 {28}		
Hulled Bermudagrass			18 {20}	24 {27}
Unhulled Bermudagrass	30 {34}		12 {13}	
Annual Lespedeza (Kobe)				38 {43}
White Dutch Clover	5 {6}		6 {7}	
Notes	1	2		
Required Permanent Plant	Bermudagrass			

1. During this season Ryegrass, Bermudagrass and Clover are required where vegetation must be established within an area no further than 15 feet {3 m} from the edge of mainline pavement. (This is usually required for short duration work that is done on pavement resurfacing projects.)
2. Annual Ryegrass is required where vegetation must be established within an area that extends further than 15 feet {3 m} from the edge of mainline pavement. Seeding in stubble for the establishment of permanent vegetation is required during the following month of March.

ZONE 2 - AREAS SUBJECT TO FREQUENT MOWING
REQUIRED POUNDS PER ACRE {KILOGRAMS PER HECTARE} OF PURE LIVE SEED

Date of Planting	Aug. 16 to Feb. 29		Mar. 1 to Apr. 15	Apr. 16 to Aug. 15
Annual Ryegrass	10 {11}	25 {28}		
Hulled Bermudagrass			18 {20}	24 {27}
Unhulled Bermudagrass	30 {34}		12 {13}	
Annual Lespedeza (Kobe)				38 {43}
White Dutch Clover	5 {6}		6 {7}	
Notes	1	2		
Required Permanent Plant	Bermudagrass			

1. During this season Ryegrass, Bermudagrass and Clover are required where vegetation must be established within an area no further than 15 feet {3 m} from the edge of mainline pavement. (This is usually required for short duration work that is done on pavement resurfacing projects.)
2. Annual Ryegrass is required where vegetation must be established within an area that extends further than 15 feet {3 m} from the edge of mainline pavement. Seeding in stubble for the establishment of permanent vegetation is required during the following month of March.

ZONE 1 - AREAS NOT SUBJECT TO FREQUENT MOWIN
REQUIRED POUNDS PER ACRE {KILOGRAMS PER HECTARE} OF PUI

Date of Planting	Jan. 1 to Feb. 29	Mar. 1 to August 15	Au No
Annual Ryegrass	15 {17}		
Hulled Bermudagrass		18 {20}	
Unhulled Bermudagrass	35 {39}	12 {13}	18
Tall Fescue	35 {39}	35 {39}	35
Weeping Lovegrass		2 {2}	
Hulled Sericea Lespedeza		38 {43}	38
Unhulled Sericea Lespedeza	38 {43}		
Reseeding Crimson Clover			29
Required Permanent Plant	Mixed		

ZONE 3 - AREAS SUBJECT TO FREQUENT MOWING
REQUIRED POUNDS PER ACRE {KILOGRAMS PER HECTARE} OF PURE LIVE SEED

Date of Planting	Sept. 1 to Feb. 29		Mar. 1 to Aug. 31	Mar 1. to Aug. 31
Annual Ryegrass	10 {11}	25 {28}		
Hulled Bermudagrass		*	18 {20}	
Unhulled Bermudagrass	30 {34}		12 {13}	12 {13}
Annual Lespedeza (Kobe)			38 {43}	24 {27}
Pensacola Bahia Grass				47 {53}
Reseeding Crimson Clover	5 {6}			
Notes	1	2	3	3
Required Permanent Plant	Bermudagrass			Pensacola Bahia Grass

1. During this season Ryegrass, Bermudagrass and Clover are required where vegetation must be established within an area no further than 15 feet {3 m} from the edge of mainline pavement. (This is usually required for short duration work that is done on pavement resurfacing projects.)
2. Annual Ryegrass is required where vegetation must be established within an area that extends further than 15 feet {3 m} from the edge of mainline pavement. Seeding in stubble for the establishment of permanent vegetation is required during the following month of March.
3. Bermudagrass will be required as the permanent plant if it is not shown on the plans that Pensacola Bahia Grass will be required as the permanent plant.

EAS NOT SUBJECT TO FREQUENT MOWING
ACRE {KILOGRAMS PER HECTARE} OF PURE LIVE SEED

	Jan. 1 to Feb. 15	Feb. 16 to Aug. 31	Sept. 1 to Nov. 15	Nov. 16 to Dec. 31
	10 {11}	5 {6}	10 {11}	10 {11}
		18 {20}	12 {13}	
	24 {27}	12 {13}	12 {13}	24 {27}
	29 {33}		35 {39}	29 {33}
		2 {2}	2 {2}	
		50 {56}		
	29 {33}		29 {33}	29 {33}
	29 {33}	29 {33}	29 {33}	29 {33}
	Mixed			

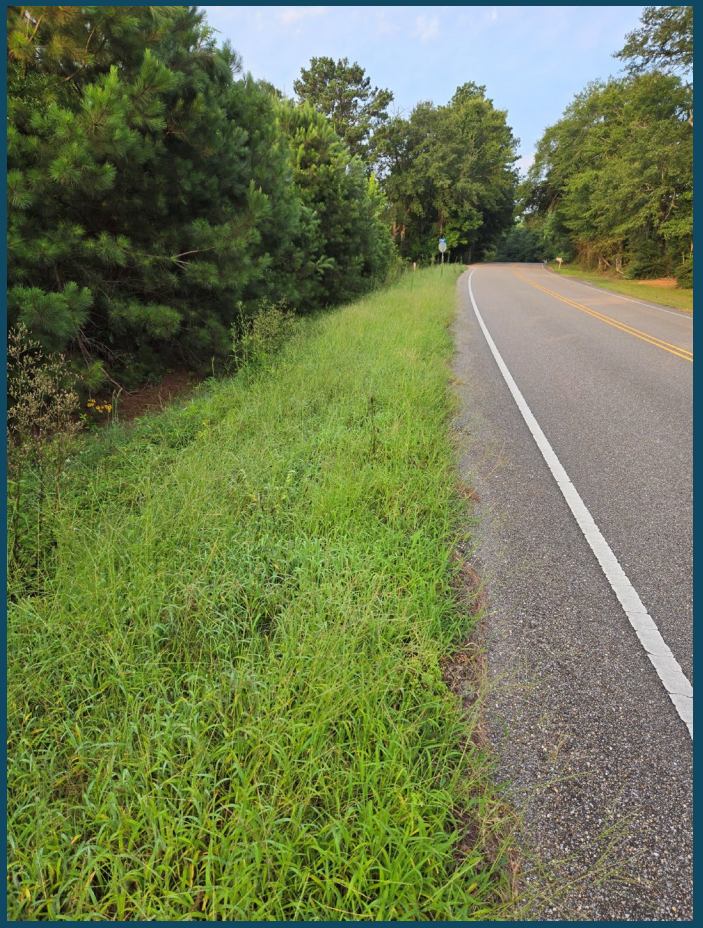
ZONE 3 - AREAS NOT SUBJECT TO FREQUENT MOWING
REQUIRED POUNDS PER ACRE {KILOGRAMS PER HECTARE} OF PURE LIVE SEED

Date of Planting	Jan. 1 to Feb. 15	Feb. 16 to Aug. 31	Sept. 1 to Nov. 30	Dec. 1 to Dec. 31
Annual Ryegrass	10 {11}		10 {11}	10 {11}
Hulled Bermudagrass		12 {13}	12 {13}	
Unhulled Bermudagrass	29 {33}	18 {20}	12 {13}	29 {33}
Tall Fescue	29 {33}		35 {39}	29 {33}
Weeping Lovegrass		2 {2}	2 {2}	
Annual Lespedeza (Kobe)		50 {56}		
Reseeding Crimson Clover	29 {33}		29 {33}	29 {33}
Pensacola Bahiagrass	29 {33}	24 {27}	29 {33}	29 {33}
Required Permanent Plant	Mixed			

ALDOT'S VEGETATION CHOICES

- Seeded permanent vegetation choices:
  - Bermuda
  - Bahia
  - Fescue (used only in areas not subject to frequent mowings)
- Rationale
  - Adaptable throughout the State
  - Seed is usually available in large scale quantities
  - Relatively low, uniform mature height
  - Germinate quickly
  - Once established they colonize quickly
  - Good soil stabilizers

COMPETITION



COMPETITION

- Produce rhizomes as early as 3 weeks
- At boot stage rhizomes can comprise 25% of the plant's weight
- 90% of rhizomes are produced after flowering
- Rhizomes grow 2 to 300 feet in the year following germination

Prior to rhizome development and growth, the plant can be treated and controlled as if it were an annual.

COMPETITION

- Jonhsongrass – 80,000 seed per year
- Musk Thistle – 100,000 seed per year
- Crabgrass – 150,000 seed per year
- Mares Tail – 250,000 seed per year

- Bermudagrass – 1000-2000 seed per year
- Bahia grass – 1000-5000 seed per year
- Fescue – 1000-5000 seed per year

Competition can have a major impact on vegetation establishment

ESTABLISHMENT METHODS

- Guidelines for vegetation establishment activities along ALDOT Rights-of-Way can be found in Sections 651, 652, and 860 of the current Standard Specifications for Highway Construction.

ESTABLISHMENT METHODS

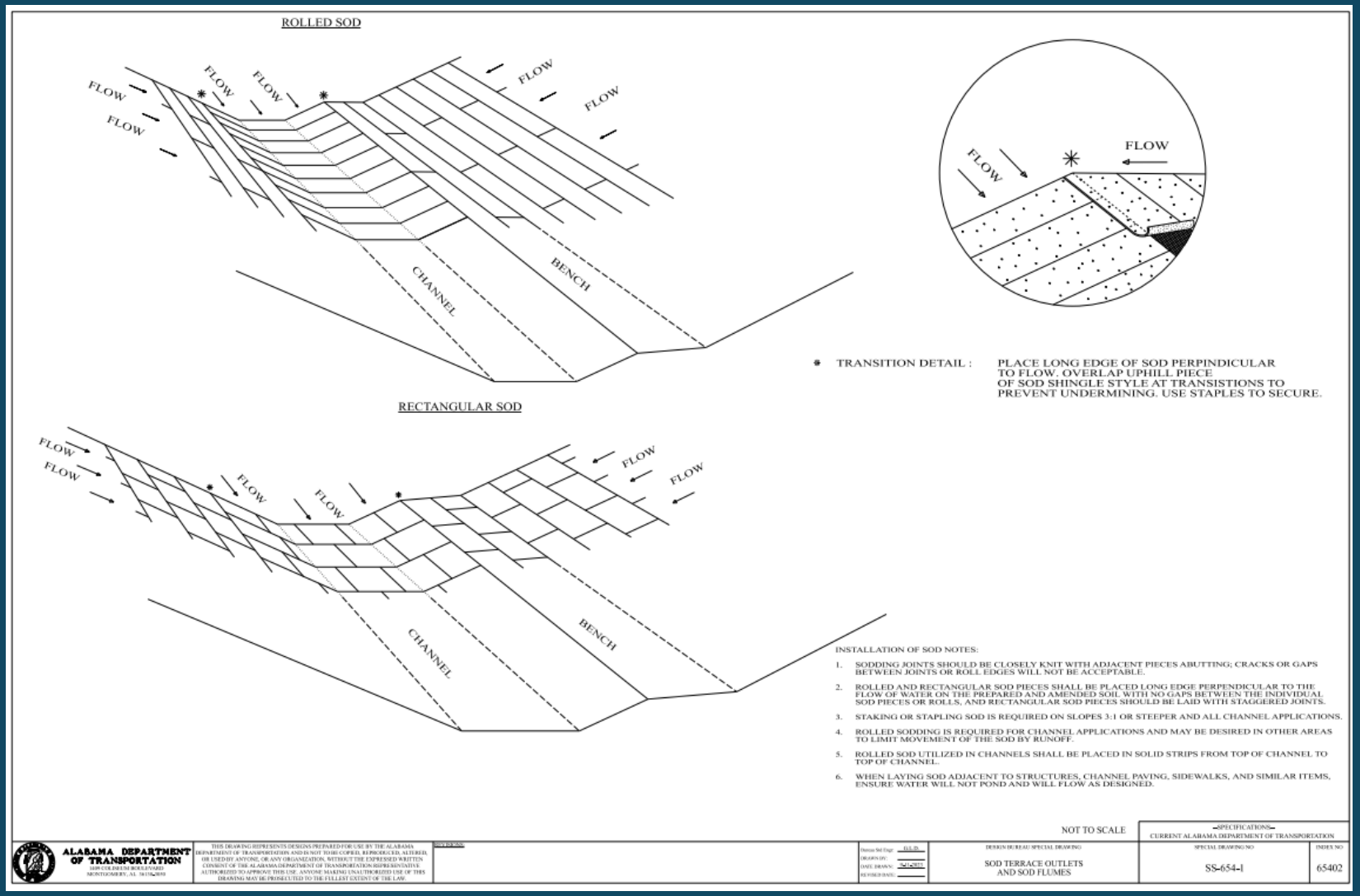
ESTABLISHMENT METHODS

Seeding vs Hydroseeding vs Sod

- Ground preparation is mainly done by the primary
- Conventional seeding vs hydroseeding is at the discretion of the grassing contractor
- Mulch and tackifier are included in hydroseeding process
- Blankets are used in cuts, and failures as required

- Sod can be used in high potential or areas of immediate stability needs such as ditch bottoms, steep slopes, or around headwalls
- Sod may also be used in areas that are to be maintained with finish mowers

ESTABLISHMENT METHODS



ESTABLISHMENT METHODS

ESTABLISHMENT METHODS

MAINTENANCE METHODS
Mowing

- Mowing is combination of contract and in house but leans more heavily towards contract
- On average, Districts are budgeted 3 mowings per year
- Districts make decision regarding when and where to mow (limit guidelines)

MAINTENANCE METHODS
Herbicides

Injection System

Air inducted nozzles

Newest trucks have a black water tank

Closed loading system

MAINTENANCE METHODS
Herbicides

75 – 80% of ALDOT herbicides now supplied in returnable recyclable containers

Limited triple rinsing of empty containers & limited container disposal

Reduces amount of rinsate released into the environment

MAINTENANCE METHODS
Herbicides

- ALDOT herbicide program is backed by scientific research
- ALDOT employees involved in the herbicide program are well trained – this includes operators, supervisors, District Administrators and even the Deputy Director of Operations
  - Passed written examinations and are in possession of current Pesticide Applicators Permits issued by ADAI
  - Attend annual training to retain eligibility for Permit renewal

PROGRAM CHANGES

- Purchase of additional ROW where possible
- Design efforts to lessen the degree of back slopes; design efforts to increase greenways impacting runoff
- Inclusion of Detention and Retention Ponds
- ALDOT now operates its herbicide program within the guidelines of operations developed in response to the National Pesticide Discharge Elimination Program
  - Make post application inspections
  - Report dates and locations of every herbicide application
  - Report the concentrations of all herbicide applications

CHALLENGES: NOW & FUTURE

- Seasonal variances
  - Wouldn’t it be nice if all construction projects were timed such that vegetation establishment could be conducted April through mid August?

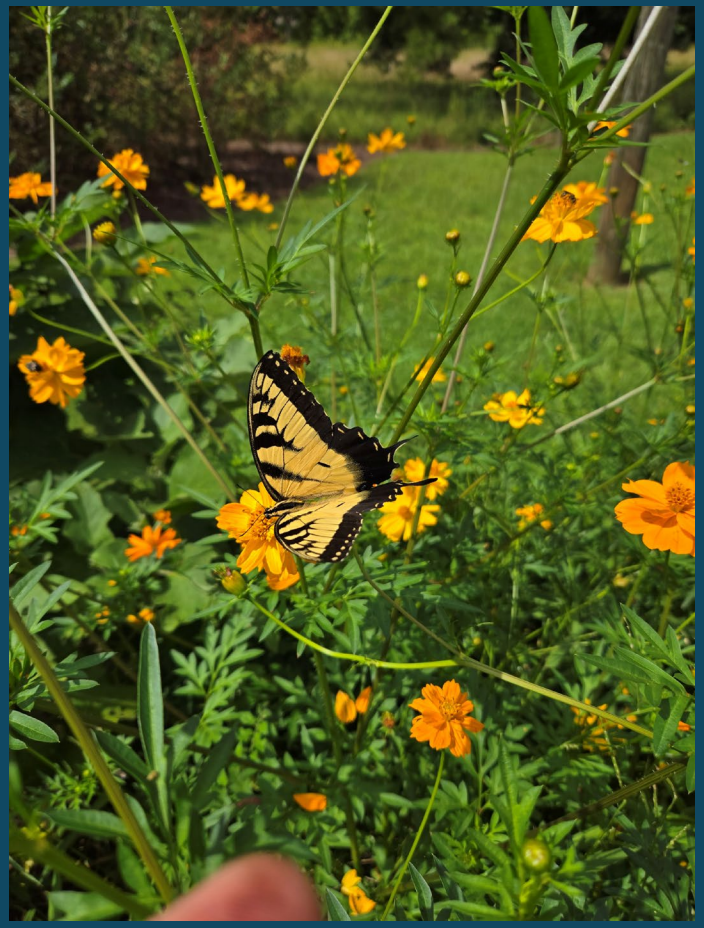
CHALLENGES: NOW & FUTURE

- The establishment of an acceptable permanent vegetative cover along linear corridors presents many challenges for ALDOT and Contractors alike.
  - Large acreages
  - Steep slopes / limited ROW
  - Geographical variances
  - Soil variances / soil fertility
  - Maintenance objectives

CHALLENGES: NOW & FUTURE

Workforce

- Reduced agriculture and / or equipment experience
- No back yard gardens
- Reduced activity in Nature



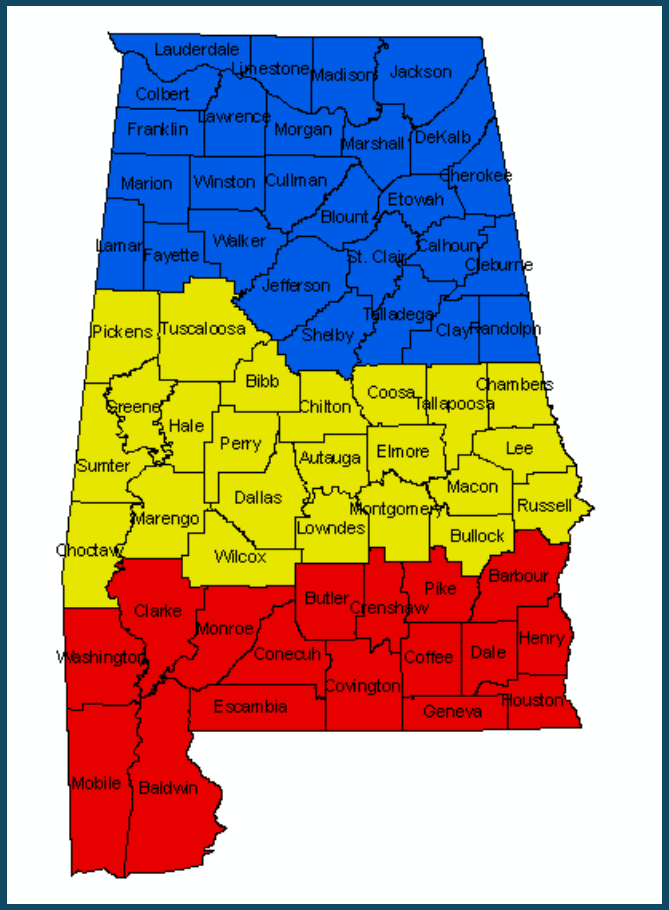
CHALLENGES: NOW & FUTURE

Seed Quality

- Section 860.01 states that seeds shall have been tested for % purity and % germination within 9 months of use.
- Results of 74 samples submitted to the Department of Agriculture & Industries:
  - Minimum % purity - 20% did not met specs
  - Minimum germination – 34% did not meet specs
  - Analysis within 9 months – 43% did not meet specs

CHALLENGES: NOW & FUTURE

Compromise



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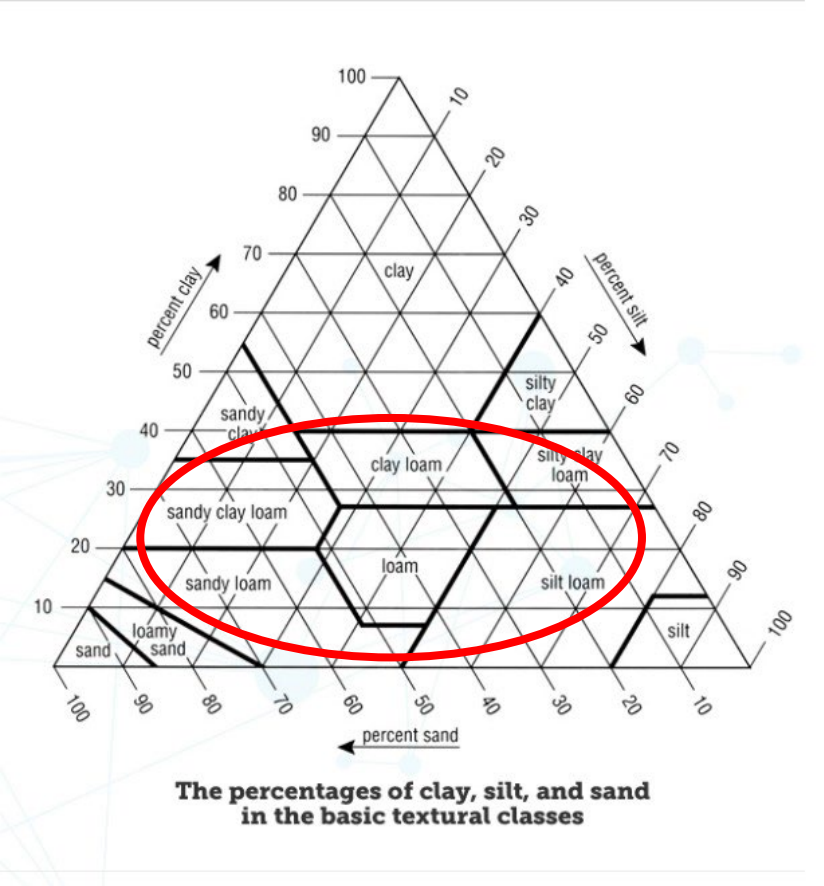
Hulled Bermudagrass		18 {20}	12 {13}	
Unhulled Bermudagrass	24 {27}	12 {13}	12 {13}	24 {27}
Tall Fescue	29 {33}		35 {39}	29 {33}
Weeping Lovegrass		2 {2}	2 {2}	
Annual Lespedeza (Kobe)		50 {56}		
Reseeding Crimson Clover	29 {33}		29 {33}	29 {33}
Pensacola Bahia Grass	29 {33}	29 {33}	29 {33}	29 {33}
Required Permanent Plant	Mixed			

CHALLENGES: NOW & FUTURE

Compromise



The percentages of clay, silt, and sand in the basic textural classes

SECTION 650
TOPSOIL

650.01 Description.

This Section shall cover the work of furnishing and placing topsoil and the placement of State furnished topsoil from stockpiles.

650.02 Materials.

(a) Required Properties of Topsoil.

Topsoil furnished or stockpiled by the Contractor shall meet the requirements given in ASTM D 5268 "Standard Specification for Topsoil for Landscape Purposes". The composition of the topsoil shall be as follows (from ASTM D 5268):

REQUIRED PROPERTIES OF TOPSOIL	
Deleterious Materials (rock, gravel, slag, cinder, roots, sod) in the Total Sample	7 % maximum by weight {mass}
Organic Material in Portion of Sample Passing the No. 10 {2 mm} Sieve	2 % to 20 % by weight {mass}
Sand Content in Portion of Sample Passing the No. 10 {2 mm} Sieve	10 % to 90 % by weight {mass}
Silt and Clay Content in Portion of Sample Passing the No. 10 {2 mm} Sieve	10 % to 90 % by weight {mass}
pH	5 to 7

Topsoil will be sampled at the source and tested prior to application by the Engineer in accordance with ASTM D 5268 for compliance with these requirements.

CHALLENGES: NOW & FUTURE

Inspection

Ensure you get:

- **What you specified**

CHALLENGES: NOW & FUTURE

Inspection

Ensure you get:

- **What you specified**

CHALLENGES: NOW & FUTURE

Inspection

Ensure you get:

- **What you wanted**

CHALLENGES: NOW & FUTURE

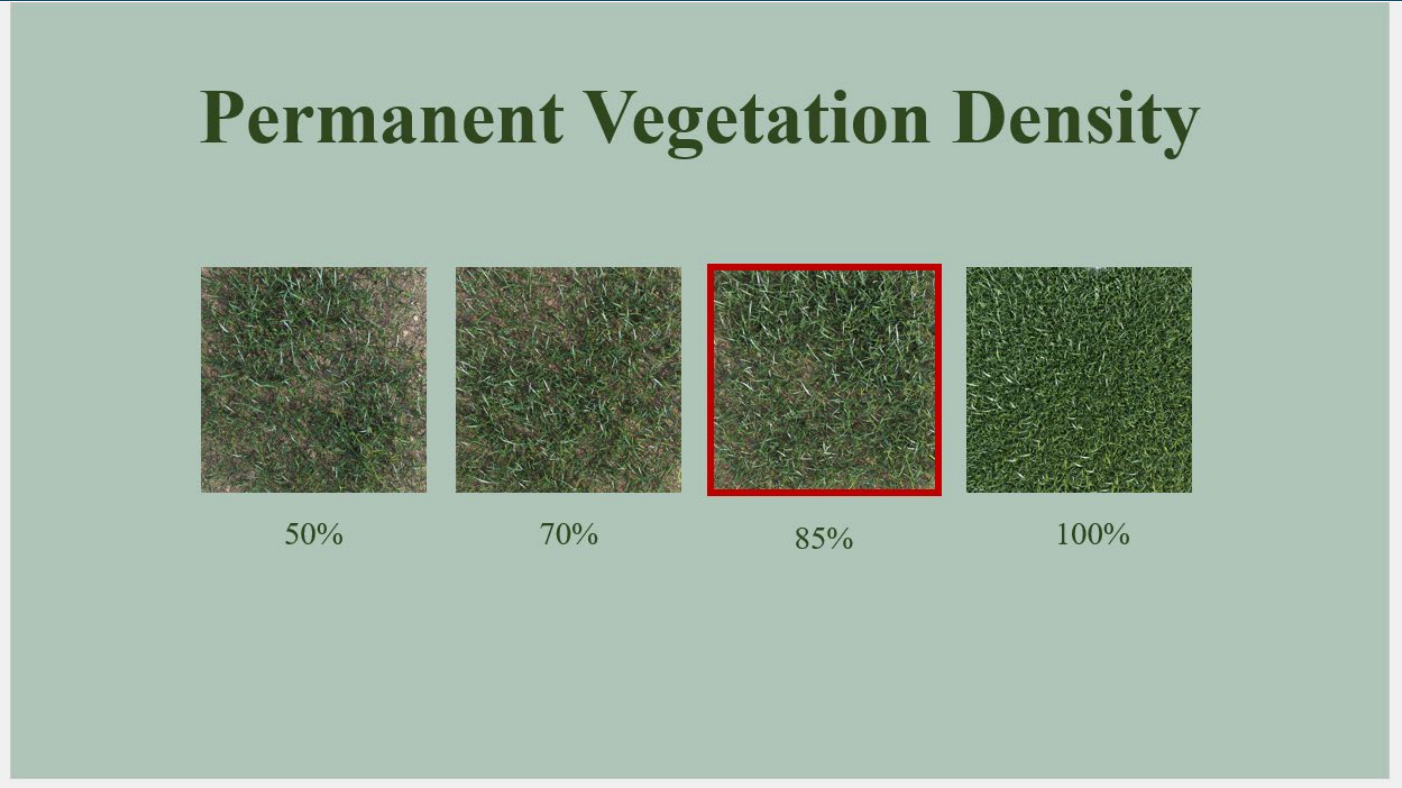
Inspection

Ensure you get:

What you needed

CHALLENGES: NOW & FUTURE

Inspection



ADAI is now suggesting a target of 85% Permanent Vegetation Density for land management practices

CHALLENGES: NOW & FUTURE

Contractors

- Contractors are limited in number
  - Same workforce issues as ALDOT
- Contractors are reluctant to come in and seed small sections but would rather wait until the end of the project and seed the whole thing
- Water issues

CHALLENGES: NOW & FUTURE
NATIVES AND POLLINATORS

- At present there is no planned inclusion in new construction projects
- Maintenance Bureau has an ongoing project (3 sites) where mowing has been eliminated or reduced and selective back-pack operations have been used to remove trees and brush to promote the expression of native vegetation
- There is a research proposal presently up for review: effort to transition back slopes to vegetation more beneficial to native vegetation and pollinators

QUESTIONS?