

---

# ADDITIONAL STANDARD AND SPECIFICATIONS FOR TEMPORARY STABILIZATION

**Definition:** The planting of quick growing vegetation to provide temporary stabilization on disturbed areas.

**Purpose:** To temporarily stabilize the soil, reduce damage from sediment and runoff to downstream or off-site areas, and to provide protection to disturbed areas until permanent vegetation or other erosion control measures can be established.

## Conditions Where Practice Applies

Graded or cleared areas which are subject to erosion for a period of 14 days or more.

## Specifications

### 1. Site Preparation

- a. Prior to seeding, install needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, grassed waterways, and sediment basins.
- b. Final grading and shaping are not necessary for temporary seedings.

### 2. Seedbed Preparation

It is important to prepare a good seedbed to ensure the success of establishing vegetation. The seedbed should be well prepared, loose, uniform, and free of large clods, rocks, and other objectionable material. The soil surface should not be compacted or crusted.

### 3. Soil Amendments - Soil amendments are not typically required for temporary stabilization. However, in some cases soil conditions may be so poor that amendments are needed to establish even a temporary vegetative cover. Under these extreme conditions, the following guidelines should be used:

- a. Lime - Apply liming materials based on the recommendations of a soil test in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply dolomitic limestone at the rate of 1 to 2 tons per acre. Apply limestone uniformly and incorporate into the top 4 to 6 inches of soil. For additional information, see **Section 3.4.3.1, Additional Standards and Specifications for Soil Testing**.
- b. Fertilizer - Apply fertilizer based on the recommendations of a soil test in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply a formulation of 10-10-10 at the rate of 600 pounds per acre. Apply fertilizer uniformly and incorporate into the top 4 to 6 inches of soils. For additional information, see **Section 3.4.3.1, Additional Standards and Specifications for Soil Testing**.

---

#### 4. Seeding

- a. **Figure 3.4.3.2a** contains a list of recommended seed species for temporary stabilization and optimum seeding dates. Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.
- b. Apply seed uniformly with a broadcast seeder, drill, cultipacker seeder or hydroseeder. All seed will be applied at the recommended rate and planting depth.
- c. Seed that has been broadcast should be covered by raking or dragging and then lightly tamped into place using a roller or cultipacker. If hydroseeding is used and the seed and fertilizer is mixed, they will be mixed on site and the seeding shall be done immediately and without interruption.

#### 5. Mulching

All mulching shall be done in accordance with **Section 3.4.5, Standard and Specifications for Mulching**.

**TEMPORARY SEEDING BY RATES, DEPTHS AND DATES**

Mix #	Species <sup>5</sup>	Seeding Rate		Optimum Seeding Dates <sup>1</sup>							Planting Depth <sup>3</sup>
				Coastal Plain			Piedmont			All	
				O = Optimum Planting Period; A = Acceptable Planting Period							
Certified Seed	lb/Ac <sup>4</sup>	lb/1000 sq.ft.	2/1-4/30	<sup>2</sup> 5/1-8/14	8/15-10/31	3/1-4/30	<sup>2</sup> 5/1-7/31	8/1-10/31	10/31-2/1		
1	Barley	125	4	O	A	O	O	A	O		1-2 inches 2-3" sandy soils
2	Oats	125	4	O	A	A	O	A	A		1-2 inches 2-3" sandy soils
3	Rye	125	4	O	A	O	O	A	O	A	1-2 inches 2-3" sandy soils
4	Perennial Ryegrass	125	4	O	A	O	O	A	O		0.5 inches 1-2" sandy soils
5	Annual Ryegrass	125	4	O	A	O	O	A	O	A	0.5 inches 1-2" sandy soils
6	Winter Wheat	125	4	O	A	O	O	A	O	A	1-2 inches 2-3" sandy soils
7	Foxtail Millet	30 PLS	0.7		O			O			0.5 inches 1-2" sandy soils
8	Pearl Millet	20 PLS	0.5		O			O			0.5 inches 1-2" sandy soils

1. Winter seeding requires 3 tons per acre of straw mulch for proper stabilization.
2. May be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
3. Applicable on slopes 3:1 or less.
4. Use varieties currently recommended for Delaware. Contact a County Extension Office for information.
5. Warm season grasses such as Millet may be used between 5/1 and 9/1 if desired. Seed at 3-5 lbs. per acre. Good on low fertility and acid areas. Seed after frost through summer at a depth of 0.5".

**Figure 3.4.3.2a Temporary seeding guidelines**

---

This page left intentionally blank.

---

# **ADDITIONAL STANDARD AND SPECIFICATIONS FOR PERMANENT STABILIZATION**

**Definition:** The establishment of perennial vegetation to provide permanent stabilization on disturbed areas.

**Purpose:** To permanently stabilize soil on disturbed areas and to reduce sediment and runoff to downstream or off-site areas.

## **Conditions Where Practice Applies**

Graded or cleared areas subject to erosion and where a permanent, long-lived vegetative cover is needed. In most cases, vegetation is the preferred method of stabilizing bare soil because of its numerous benefits. However, it cannot be expected to provide an erosion control cover and prevent soil slippage on a soil that is not stable due to its texture, structure, water movement or excessively steep slope.

## **Minimum Soil Conditions Needed for the Establishment and Maintenance of Permanent Vegetative Cover**

1. Enough fine-grained materials to provide the capacity to hold at least a moderate amount of available moisture.
2. Sufficient pore space to permit adequate root penetration.
3. The soil shall be free from any material harmful to plant growth.
4. If these conditions cannot be met, see **Section 3.4.1, Standard and Specifications for Topsoiling**.

## **Specifications**

1. Site Preparation
  - a. Prior to seeding, install needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, grassed waterways, and sediment basins.
  - b. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding, mulch application, anchoring and maintenance. All irregularities in the surface must be corrected in order to prevent the formation of depressions or water pockets.
2. Seedbed Preparation
  - a. It is important to prepare a good seedbed to ensure the success of establishing vegetation. The seedbed shall be well pulverized, loose, uniform, and free of large clods, rocks, and other objectionable material.
  - b. Flat areas and slopes up to 3:1 grade shall be loose and friable to a depth of at least 4 inches. The top layer of soil shall be loosened by raking, disking or other acceptable means before seeding.

- 
- c. Slopes steeper than 3:1 shall have the top 1-3 inches of soil loose and friable before seeding.

### 3. Soil Amendments

- a. Lime - Apply liming materials based on the recommendations of a soil test in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply dolomitic limestone at the rate of 1 to 2 tons per acre. Apply limestone uniformly and incorporate into the top 4 to 6 inches of soil. For additional information, see **Section 3.4.3.1, Additional Standards and Specifications for Soil Testing**.
- b. Fertilizer - Apply fertilizer based on the recommendations of a soil test in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply 10-10-10 at the rate of 600 pounds per acre. Apply fertilizer uniformly and incorporate into the top 4 to 6 inches of soils. For additional information, see **Section 3.4.3.1, Additional Standards and Specifications for Soil Testing**.
- c. Incorporation - On sloping land, the final disking and harrowing operation should be on the contour wherever feasible. On slopes steeper than 3:1, the lime and fertilizer shall be worked in the best way possible.

### 4. Seeding

- a. **Figure 3.4.3.3a** contains a list of recommended seed mixes for various soil conditions and optimum seeding dates. Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.
- b. Every bag of seed is required by law to have an analysis tag attached to it. This tag contains essential information about the content and quality of the turf seed therein. All of the data on the tag relates in some way to the seed in the bag. Following is a list of items and information that they represent:
  - ◆ “Product” is the species or type of seed that was tested.
  - ◆ “Lot” refers to the specific lot of seed tested, providing a tracking of the varieties, production field and components in the bag.
  - ◆ “% Purity” is the number of seeds of a species/variety, expressed as percentages of the whole, found in the mix. “VNS” means “Variety Not Stated” indicating uncertainty about the quality and characteristics of the seed.
  - ◆ “% Germination” refers to the percentage of seed that germinated during testing.
  - ◆ “Other Crop Seeds” is the percentage of crop seeds of the tested sample that have been found during a physical separation of the sample.
  - ◆ “Inert Matter” is the percentage of dust, stems, soil, chaff, etc. of the total weight of the tested sample.
  - ◆ “Weed Seed” refers to the percentage of weed seeds in a sample.
  - ◆ “Noxious Weeds” are the weed seeds considered by local law to be noxious. This number must always be zero.
  - ◆ “Origin”, “Net Weight” and “Date Tested” are self-explanatory.
- c. Apply seed uniformly with a broadcast seeder, drill, cultipacker or hydroseeder. All seed will be applied at the recommended rate and planting depth. Drill seeding is the preferred method, especially when light, fluffy seeds are in the mix. When hydroseeding is the chosen method, the total rate of seed should be

---

increased by 25% over the rates recommended in **Figure 3.4.3.3a**. Seed mixtures loaded into boxes or containers, such as those found on drill seeders, should be agitated to prevent stratification in the box. Some seeders are also equipped with multiple boxes to separate the seed by species, resulting in even distribution.

- d. Seed that has been broadcast must be covered by raking or dragging and then lightly tamped into place using a roller or cultipacker. If hydroseeding is used and the seed and fertilizer is mixed, they will be mixed on site and the seeding shall be done immediately and without interruption.

## 5. Mulching

All mulching shall be done in accordance with **Section 3.4.5, Standards and Specifications for Mulching**.

## 6. Irrigation

- a. Adequate moisture is essential for seed germination and plant growth. Daily irrigation can be critical in establishing permanent vegetation during dry or hot weather or on adverse site conditions.
- b. Irrigation must be carefully controlled to prevent runoff and subsequent erosion. Inadequate or excessive irrigation can do more harm than good.

## 7. Maintenance

- a. It takes one full year to establish permanent vegetation from the time of planting. Inspect seeded areas for failure and reestablish vegetation as soon as possible. Depending on site conditions, it may be necessary to irrigate, fertilize, overseed, or re-establish plantings in order to provide permanent vegetation for adequate erosion control.
- b. Maintenance fertilization rates should be established by soil test recommendations in accordance with an approved nutrient management plan. Spring seedings may require an application of fertilizer between September 1 and October 15, at least every two years. Fall seedings may require the same between March 15 and May 1 the following year. If slow-release fertilizer is used, follow-up fertilizations may not be necessary for several years. Lime according to soil test recommendations at least once every five years. For additional information, see **Section 3.4.3.1, Additional Standards and Specifications for Soil Testing**.

## 8. Special Conditions

Under certain site conditions, alternative vegetative stabilization techniques are necessary. Examples include steeply sloped areas, extremely low fertility soils, acidic soils (pH less than 4.0) and dune stabilization. When any of these or other unusual site conditions are encountered, DNREC and/or the appropriate delegated agency may require products, seed species, mixtures and rates other than those listed in the following tables in order to achieve successful stabilization.

PERMANENT SEEDING AND SEEDING DATES													
Seeding Mixtures		Seeding Rate <sup>1</sup>		Optimum Seeding Dates <sup>2</sup> O = Optimum Planting Period A = Acceptable Planting Period								Remarks	
Mix No.	Certified Seed <sup>3</sup>	lb/Ac	lb/1000 sq.ft.	Coastal Plain			Piedmont			All <sup>4</sup>			
				2/1-4/30	5/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31	10/31-2/1			
1	Tall Fescue Canada Wild Rye	140 10	3.2 0.23	A	O	A	A	O	A	Add 100 lbs./ac Winter Rye	Good erosion control mix Tolerant of low fertility soils Good for droughty sites		
2	Deertongue Sheep Fescue White Clover	30 30 10	0.69 0.69 0.35	A	O	A	A	O	A	Add 100 lbs./ac Winter Rye	Good erosion control mix Tolerant of low fertility soils Legume that fixes atmospheric N into soil		
3	Tall Fescue (Turf-type) or Strong Creeping Red Fescue or Perennial Ryegrass plus Flatpea <sup>5</sup>	50 50 50 15	1.15 1.15 1.15 0.34	O	A <sup>4</sup>	O	O	A <sup>4</sup>	O	Add 100 lbs./ac Winter Rye	Good erosion control mix Tall Fescue for droughty conditions. Creeping Red Fescue for heavy shade. Flatpea to suppress woody vegetation.		
4	Strong Creeping Red Fescue Kentucky Bluegrass Perennial Ryegrass or Redtop plus White Clover <sup>5</sup>	100 70 15 5 3	2.3 1.61 0.35 0.11 0.07	O	A <sup>4</sup>	O	O	A <sup>4</sup>	O	Add 100 lbs./ac Winter Rye	Suitable waterway mix. Canada Bluegrass more drought tolerant. Use Redtop for increased drought tolerance.		
5	Switchgrass <sup>6,7</sup> or Coastal Panicgrass Big Bluestem Little Bluestem Indian Grass	10 10 5 5 5	0.23 0.23 0.11 0.11 0.1		O			O			Native warm-season mixture. Tolerant of low fertility soils. Drought tolerant. Poor shade tolerance. N fertilizer discouraged - weeds		
6	Tall Fescue (turf-type) (Blend of 3 cultivars)	150	3.5	O	A <sup>4</sup>	O	O	A <sup>4</sup>	O		Managed filter strip for nutrient uptake.		
7	Tall Fescue Ky. Bluegrass (Blend) Perennial Ryegrass	150 20 20	3.5 0.46 0.46	O	A <sup>4</sup>	O	O	A <sup>4</sup>	O		Three cultivars of Kentucky Bluegrass. Traffic tolerant.		
8	Big Bluestem <sup>7</sup> Indian Grass <sup>7</sup> Little Bluestem <sup>7</sup> Creeping Red Fescue plus one of: Partridge Pea Bush Clover Wild Indigo Showy Tick-Trefoil	10 10 8 30 5 3 3 2	0.23 0.23 0.18 0.69 0.11 0.07 0.07 0.05	O	A <sup>4</sup>		O	A <sup>4</sup>			All species are native. Indian Grass and Bluestem have fluffy seeds. Plant with a specialized native seed drill. Creeping Red Fescue will provide erosion protection while the warm season grasses get established.		

Figure 3.4.3.3a Seed mixes and recommended seeding dates



PERMANENT SEEDING AND SEEDING DATES (cont.)												
Seeding Mixtures		Seeding Rate <sup>1</sup>		Optimum Seeding Dates <sup>2</sup> O = Optimum Planting Period A = Acceptable Planting Period								Remarks
Mix No.	Certified Seed <sup>3</sup>	lb/Ac	lb/1000 sq.ft.	Coastal Plain			Piedmont			All <sup>4</sup>		
				2/1-4/30	5/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31			
9	Poorly Drained Soils Redtop Creeping Bentgrass Sheep Fescue Rough Bluegrass	75 35 30 45	1.72 0.8 0.69 1	O	A <sup>4</sup>	O	O	O	A <sup>4</sup>	O	Add 100 lbs./ac. Winter Rye	Quick stabilization of disturbed sites and waterways
10	Switchgrass <sup>6</sup>	10	0.23	A		O		A		O		Good erosion control, wildlife cover and wetland revegetation.
<b>Residential Lawns</b>												
11	Tall Fescue Perennial Ryegrass Kentucky Bluegrass Blend	100 25 30	2.3 0.57 0.69	O	A <sup>4</sup>	O	O	O	A <sup>4</sup>	O		High value, high maintenance, light traffic, irrigation necessary. Well drained soils, full sun.
12	Tall Fescue Perennial Ryegrass Sheep Fescue	100 25 25	2.3 0.57 0.57	O	A <sup>4</sup>	O	O	O	A <sup>4</sup>	O		Moderate value, low maintenance, traffic tolerant
13	Creeping Red Fescue Chewings Fescue Rough Bluegrass Kentucky Bluegrass	50 50 20 20	1.15 1.15 0.4 0.4	O	A <sup>4</sup>	O	O	O	A <sup>4</sup>	O		Shade tolerant, moderate traffic tolerance, moderate maintenance.
14	Creeping Red Fescue Rough Bluegrass or Chewings Fescue	50 90	1.15 2.1	O	A <sup>4</sup>	O	O	O	A <sup>4</sup>	O		Shade tolerant, moisture tolerant.
15	K-31 Tall Fescue	150	3.5	O	A <sup>4</sup>	O	O	O	A <sup>4</sup>	O		Monoculture, but performs well alone in lawns. Discouraged.

- When hydroseeding is the chosen method of application, the total rate of seed should be increased by 25%.
- Winter seeding requires 3 tons per acre of straw mulch. Planting dates listed above are average for Delaware. These dates may require adjustment to reflect local conditions.
- All seed shall meet the minimum purity and minimum germination percentages recommended by the Delaware Department of Agriculture. The maximum % of weed seeds shall be in accordance with Chapter 15, Title 3 of the Delaware Code.
- Turf-type species may be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
- It is recommended that all leguminous seed be inoculated.
- Warm season grass mix and Switchgrass cannot be mowed more than 4 times per year.
- Warm season grasses require a soil temperature of at least 50 degrees in order to germinate and will remain dormant until then.

Figure 3.4.3.3a Seed mixes and recommended seeding dates (cont.)

Permanent Stabilization Mixtures for Various Uses		
Application	Planting Mixtures by Soil Drainage Class	
	Well Drained Soils <sup>1</sup>	Poorly Drained Soils <sup>1</sup>
Residential/commercial lots	11,12,13,15	14,15
Residential open space	8	Contact plant specialist for site specific recommendations.
Pond and channel banks, dikes, berms and dams	2, 4	9,10,14
Drainage ditches, swales, detentions basins	3, 4, 13	9,14
Filter strips	2, 5, 6	6, 13
Grassed waterways, spillways	1,2,4	6, 9
Recreation areas, athletic fields	7,15	14,15
Steep slopes and banks, roadsides, borrow areas	1,2,3,4	4, 6
Sand and gravel pits, sanitary landfills	1,2,3,5	3, 4
Dredged material, spoilbanks, borrow areas	1,2	9,10
Streambanks and shorelines <sup>2</sup>	2, 3	2, 3
Utility rights-of-way	1,2,3,4	3,14

1. Refer to **Fig. 3.4.3.3a** for detailed information on seed mixes.
  2. Refer to Chapters 16 and 18 of the NRCS Field Engineering Manual for additional measures.
- NOTE:** Refer to NRCS critical area planting standard for additional seed mixtures.

**Figure 3.4.3.3b Seed mix selection chart**

SPECIES	RECOMMENDED SEED VARIETIES
Tall Fescue	Alamo E, Apache II, Guardian, Rebel II, Shenandoah, Safari, Crossfire, Titan 2, Duke, Barrington, Comstock, Crossfire, Dominion, Heritage, Plantation, Rebel 2000, Titan 2
Kentucky Blue Grass	<i>Low Maintenance Varieties:</i> Barirus, Caliber, Eagleton, Freedom, Haga, Livingston, Merit, Midnight, Monopoly, Washington <i>Shade Tolerant Varieties:</i> Princeton, America, Brilliant, Champagne, Coventry, Unique, Liberator, Moonlight, Showcase, Nuglade, Compact
Perennial Rye Grass	Palmer III, Blazer II, Pennfine, Seville, Pinnacle, Pick MDR
Creeping Red Fescue	Cindy Lou, Jasper, Dawson, Pennlawn, Flyer, Ruby, Salem
Red Top	Streaker, Barracuda
Chewings Fescue	Longfellow, Jamestown, Discovery, Scaldis, Bighorn

**NOTES:**

1. The grass species listed in **Fig. 3.4.3.3a** are often available in many varieties. The seed choices listed above are the recommended varieties based on regional performance and availability.
2. The varieties listed above are examples of recommended varieties. Contact University of Delaware, Cooperative Extension Service for additional information.

**Figure 3.4.3.3c Recommended seed varieties**

## Standard Detail & Specifications

# Vegetative Stabilization

### TEMPORARY SEEDING BY RATES, DEPTHS AND DATES

Mix #	Species <sup>5</sup>	Seeding Rate		Optimum Seeding Dates <sup>1</sup> O = Optimum Planting Period; A = Acceptable Planting Period							Planting Depth <sup>3</sup>
		lb/Ac <sup>4</sup>	lb/1000 sq.ft.	Coastal Plain			Piedmont			All	
	Certified Seed			2/1-4/30	2 5/1-8/14	8/15-10/31	3/1-4/30	2 5/1-7/31	8/1-10/31	10/31-2/1	
1	Barley	125	4	O	A	O	O	A	O		1-2 inches 2-3" sandy soils
2	Oats	125	4	O	A	A	O	A	A		1-2 inches 2-3" sandy soils
3	Rye	125	4	O	A	O	O	A	O	A	1-2 inches 2-3" sandy soils
4	Perennial Ryegrass	125	4	O	A	O	O	A	O		0.5 inches 1-2" sandy soils
5	Annual Ryegrass	125	4	O	A	O	O	A	O	A	0.5 inches 1-2" sandy soils
6	Winter Wheat	125	4	O	A	O	O	A	O	A	1-2 inches 2-3" sandy soils
7	Foxtail Millet	30 PLS	0.7		O			O			0.5 inches 1-2" sandy soils
8	Pearl Millet	20 PLS	0.5		O			O			0.5 inches 1-2" sandy soils

1. Winter seeding requires 3 tons per acre of straw mulch for proper stabilization.
2. May be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
3. Applicable on slopes 3:1 or less.
4. Use varieties currently recommended for Delaware. Contact a County Extension Office for information.
5. Warm season grasses such as Millet may be used between 5/1 and 9/1 if desired. Seed at 3-5 lbs. per acre. Good on low fertility and acid areas. Seed after frost through summer at a depth of 0.5".

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

Source:

Delaware ESC Handbook

Symbol:

Detail No.

**DE-ESC-3.4.3**

Sheet 1 of 4

# Standard Detail & Specifications

## Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES											
Seeding Mixtures		Seeding Rate <sup>1</sup>		Optimum Seeding Dates <sup>2</sup> O = Optimum Planting Period A = Acceptable Planting Period						Remarks	
Mix No.	Certified Seed <sup>3</sup>			Coastal Plain			Piedmont			All <sup>4</sup>	
	Well Drained Soils	lb/Ac	lb/1000 sq.ft.	2/1-4/30	5/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31	10/31-2/1	
1	Tall Fescue Canada Wild Rye	140 10	3.2 0.23	A	O	A	A	O	A	Add 100 lbs./ac Winter Rye	Good erosion control mix Tolerant of low fertility soils Good for droughty sites
2	Deertongue Sheep Fescue White Clover	30 30 10	0.69 0.69 0.35	A	O	A	A	O	A	Add 100 lbs./ac Winter Rye	Good erosion control mix Tolerant of low fertility soils Legume that fixes atmospheric N into soil
3	Tall Fescue (Turf-type) <b>or</b> Strong Creeping Red Fescue <b>or</b> Perennial Ryegrass <b>plus</b> Flatpea <sup>5</sup>	50 50 50 15	1.15 1.15 1.15 0.34	O	A <sup>4</sup>	O	O	A <sup>4</sup>	O	Add 100 lbs./ac. Winter Rye	Good erosion control mix Tall Fescue for droughty conditions. Creeping Red Fescue for heavy shade. Flatpea to suppress woody vegetation.
4	Strong Creeping Red Fescue Kentucky Bluegrass Perennial Ryegrass <b>or</b> Redtop <b>plus</b> White Clover <sup>5</sup>	100 70 15 5 3	2.3 1.61 0.35 0.11 0.07	O	A <sup>4</sup>	O	O	A <sup>4</sup>	O	Add 100 lbs./ac. Winter Rye	Suitable waterway mix. Canada Bluegrass more drought tolerant. Use Redtop for increased drought tolerance.
5	Switchgrass <sup>6,7</sup> <b>or</b> Coastal Panicgrass Big Bluestem Little Bluestem Indian Grass	10 10 5 5 5	0.23 0.23 0.11 0.11 0.1		O			O			Native warm-season mixture. Tolerant of low fertility soils. Drought tolerant. Poor shade tolerance. N fertilizer discouraged - weeds
6	Tall Fescue (turf-type) (Blend of 3 cultivars)	150	3.5	O	A <sup>4</sup>	O	O	A <sup>4</sup>	O		Managed filter strip for nutrient uptake.
7	Tall Fescue Ky. Bluegrass (Blend) Perennial Ryegrass	150 20 20	3.5 0.46 0.46	O	A <sup>4</sup>	O	O	A <sup>4</sup>	O		Three cultivars of Kentucky Bluegrass. Traffic tolerant.
8	Big Bluestem <sup>7</sup> Indian Grass <sup>7</sup> Little Bluestem <sup>7</sup> Creeping Red Fescue <b>plus one of:</b> Partridge Pea Bush Clover Wild Indigo Showy Tick-Trefoil	10 10 8 30 5 3 3 2	0.23 0.23 0.18 0.69 0.11 0.07 0.07 0.05	O	A <sup>4</sup>		O	A <sup>4</sup>			All species are native. Indian Grass and Bluestem have fluffy seeds. Plant with a specialized native seed drill.  Creeping Red Fescue will provide erosion protection while the warm season grasses get established.

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

<b>Source:</b>  Delaware ESC Handbook	<b>Symbol:</b>	<b>Detail No.</b>  <b>DE-ESC-3.4.3</b> Sheet 2 of 4
---	----------------	--

# Standard Detail & Specifications

## Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES (cont.)											
Seeding Mixtures		Seeding Rate <sup>1</sup>		Optimum Seeding Dates <sup>2</sup> O = Optimum Planting Period A = Acceptable Planting Period						Remarks	
Mix No.	Certified Seed <sup>3</sup>			Coastal Plain			Piedmont			All <sup>4</sup>	
	Poorly Drained Soils	lb/Ac	lb/1000 sq.ft.	2/1-4/30	5/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31	10/31-2/1	
9	Redtop Creeping Bentgrass Sheep Fescue Rough Bluegrass	75 35 30 45	1.72 0.8 0.69 1	O	A <sup>4</sup>	O	O	A <sup>4</sup>	O	Add 100 lbs./ac. Winter Rye	Quick stabilization of disturbed sites and waterways
10	Switchgrass <sup>6</sup>	10	0.23	A		O	A		O		Good erosion control, wildlife cover and wetland revegetation.
Residential Lawns											
11	Tall Fescue Perennial Ryegrass Kentucky Bluegrass Blend	100 25 30	2.3 0.57 0.69	O	A <sup>4</sup>	O	O	A <sup>4</sup>	O		High value, high maintenance, light traffic, irrigation necessary. Well drained soils, full sun.
12	Tall Fescue Perennial Ryegrass Sheep Fescue	100 25 25	2.3 0.57 0.57	O	A <sup>4</sup>	O	O	A <sup>4</sup>	O		Moderate value, low maintenance, traffic tolerant
13	Creeping Red Fescue Chewings Fescue Rough Bluegrass Kentucky Bluegrass	50 50 20 20	1.15 1.15 0.4 0.4	O	A <sup>4</sup>	O	O	A <sup>4</sup>	O		Shade tolerant, moderate traffic tolerance, moderate maintenance.
14	Creeping Red Fescue Rough Bluegrass or Chewings Fescue	50 90	1.15 2.1	O	A <sup>4</sup>	O	O	A <sup>4</sup>	O		Shade tolerant, moisture tolerant.
15	K-31 Tall Fescue	150	3.5	O	A <sup>4</sup>	O	O	A <sup>4</sup>	O		Monoculture, but performs well alone in lawns. Discouraged.

- When hydroseeding is the chosen method of application, the total rate of seed should be increased by 25%.
- Winter seeding requires 3 tons per acre of straw mulch. Planting dates listed above are average for Delaware. These dates may require adjustment to reflect local conditions.
- All seed shall meet the minimum purity and minimum germination percentages recommended by the Delaware Department of Agriculture. The maximum % of weed seeds shall be in accordance with Chapter 15, Title 3 of the Delaware Code.
- Turf-type species may be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
- It is recommended that all leguminous seed be inoculated.
- Warm season grass mix and Switchgrass cannot be mowed more than 4 times per year.
- Warm season grasses require a soil temperature of at least 50 degrees in order to germinate and will remain dormant until then.

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

Source: Delaware ESC Handbook	Symbol:	Detail No. <b>DE-ESC-3.4.3</b> Sheet 3 of 4
----------------------------------	---------	---

# Standard Detail & Specifications

## Vegetative Stabilization

### Construction Notes:

#### 1. Site Preparation

- a. Prior to seeding, install needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, grassed waterways, and sediment basins.
- b. Final grading and shaping is not necessary for temporary seedings.

#### 2. Seedbed Preparation

It is important to prepare a good seedbed to ensure the success of establishing vegetation. The seedbed should be well prepared, loose, uniform, and free of large clods, rocks, and other objectionable material. The soil surface should not be compacted or crusted.

#### 3. Soil Amendments

- a. Lime - Apply liming materials based on the recommendations of a **soil test** in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply dolomitic limestone at the rate of 1 to 2 tons per acre. Apply limestone uniformly and incorporate into the top 4 to 6 inches of soil.
- b. Fertilizer - Apply fertilizer based on the recommendations of a **soil test** in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply a formulation of 10-10-10 at the rate of 600 pounds per acre. Apply fertilizer uniformly and incorporate into the top 4 to 6 inches of soils.

#### 4. Seeding

- a. For **temporary stabilization**, select a mixture from **Sheet 1**. For a **permanent stabilization**, select a mixture from **Sheet 2** or **Sheet 3** depending on the conditions. Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.
- b. Apply seed uniformly with a broadcast seeder, drill, cultipacker seeder or hydroseeder. All seed will be applied at the recommended rate and planting depth.
- c. Seed that has been broadcast should be covered by raking or dragging and then lightly tamped into place using a roller or cultipacker. If hydroseeding is used and the seed and fertilizer is mixed, they will be mixed on site and the seeding shall be done immediately and without interruption.

#### 5. Mulching

All mulching shall be done in accordance with detail **DE-ESC-3.4.5**.

Source: Delaware ESC Handbook	Symbol:	Detail No. <b>DE-ESC-3.4.3</b> Sheet 4 of 4
----------------------------------	---------	---