

# CRITICAL AREA PLANTING

(Acre)  
Code 342

Natural Resources Conservation Service  
Conservation Practice Standard

## I. Definition

Establishing permanent vegetation on sites that have or are expected to have high erosion rates, and on sites that have physical, chemical, or biological conditions that prevent the establishment of vegetation with normal practices.

## II. Purposes

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

- stabilize and restore riparian areas,
- stabilize stream and channel banks and shorelines,
- stabilize areas with existing or expected high rates of soil erosion by water or wind,
- rehabilitate and revegetate degraded sites that cannot be stabilized using normal establishment techniques.

## III. Conditions Where Practice Applies

This practice applies to highly disturbed areas such as:

- active or abandoned surface mine sites,
- urban conservation sites,
- road construction areas,
- conservation practice construction sites,
- areas needing stabilization before or after natural disasters such as floods, tornados, and wildfires,
- eroded banks of natural channels, banks of newly constructed channels, and lake shorelines, and
- areas degraded by human activities.

## IV. Federal, Tribal, State and Local Laws

Critical area planting practices shall comply with all federal, tribal, state and local laws, rules or regulations. The landowner and/or operator is responsible for securing required permits. This

standard does not contain the text of the federal, tribal, state or local laws.

## V. Criteria

### A. General Criteria Applicable To All Purposes.

#### 1. Site Assessment

A site investigation shall be conducted to identify any physical, chemical, or biological conditions that could affect the successful establishment of vegetation. The site investigation shall include evaluation of: soil characteristics, soil fertility, slope, *aspect*<sup>1</sup>, moisture regime, climatic patterns, proximity to natural plant community, and site history.

Areas to be planted will be cleared of unwanted materials and smoothed or shaped, if needed, to meet planting and landscaping purposes.

Compacted layers will be ripped and the soil re-firmed prior to seedbed preparation.

On tilled or disturbed sites, prepare a firm seedbed. The seedbed shall contain enough fine particles for uniform shallow coverage of seed and contact with moisture and nutrients. For details on seedbed preparation, refer to Wisconsin Agronomy Technical Notes 5, Establishing and Maintaining Native Grasses, Legumes, and Forbs; and 6, Establishing and Maintaining Introduced Grasses and Legumes.

#### 2. Specie Selection and Seed Quality

Species selected for planting shall be suited to current site conditions, intended use, and be resistant to diseases and insects common to the site location.

<sup>1</sup>Words in the standard that are shown in italics are described in X. Definitions. The words are italicized the first time they are used in the text.

Selected species will have the capacity to achieve adequate density and vigor to stabilize the site within an appropriate period.

Plant native herbaceous and woody vegetation suitable for the site.

Species identified as restricted or prohibited by law shall not be planted.

*Certified Seed* shall be used, and seeding rates will be based on *Pure Live Seed (PLS)*. Seed tag information such as purity and germination and any computations to adjust seeding rates must be submitted to document actual seeding rates. *Actual adjusted seeding rates* will be based on the equivalent of 100 percent PLS, determined by multiplying the percent purity by the percent germination.

*Untested* introduced and native grass and forb seed are not approved for planting.

When certified seed is unavailable or difficult to locate, *non-certified* seed can be used, as long as the seed has been tested for varietal purity, germination, and other mechanical qualities, such as inert matter and other crop or weed seeds.

If more than 20 percent of legume seed is hard seed, increase the seeding rate for legumes by the percent of hard seed.

Introduced and native legume seed shall be inoculated immediately prior to planting. Rhizobia inoculant shall be specific to the legume seeded. When more than one legume species is used, each species will be inoculated separately.

### 3. Seeding Periods

The specific date that provides the best chance for success will vary from south to north and from year to year with prevailing moisture and temperature conditions. Late summer seeding is generally riskier than spring seeding. Planting at either end of the allowable range is riskier than the middle of the range. Refer to Figure 1 for planting zones and Tables 1 and 2 for seeding dates.

Seeding outside of the recommended dates must be approved by the Area Resource Conservationist or State Agronomist.

With approval, dormant seeding can be used when planting introduced species. When using dormant seedings in concentrated flow areas, the site must be mulched according to Wisconsin NRCS Field Office Technical Guide, Section IV, (WI FOTG) Conservation Practice Standard 484, Mulching.

### 4. Nutrient and Soil Amendment Requirements

When seeding *introduced species*, soil fertility and pH level will be amended to satisfy the needs of the plant species to be established. Fertilizer and lime recommendations will be determined by a soil test, and all nutrients will be applied following WI FOTG Standard 590, Nutrient Management. If no soil test is available, apply a minimum of 150 pounds of 20-10-10 fertilizer and 2 tons of 80-89 lime or equivalent per acre. Soil amendments may be waived at the discretion of a certified conservation planner.

For establishment of *native species*, use of soil amendments are not required.

### 5. Seedbed Preparation

Prior to planting into cropland fields, verify that herbicides previously applied to the site will not "carry over" and damage the new seeding.

Site preparation shall be adequate to assure weed suppression and to promote germination and growth of the species planted.

Planting equipment type, use, and timing shall be appropriate for the site conditions, soil characteristics, and type of seeds (size, etc.) selected to assure uniform placement and germination.

Refer to Wisconsin Agronomy Technical Note 5, Establishing and Maintaining Native Grasses, Forbs, and Legumes; and Wisconsin Agronomy Technical Note 6, Establishing and Maintaining Introduced Grasses and Legumes, for detailed guidance for specific situations.

6. Mulching, Temporary Cover, and Companion Crop

Mulching, temporary cover, and companion crops are vital practices utilized to support the establishment of a critical area planting. Use depends on the site conditions, method of planting, and seed mixture.

For further details on mulching, temporary cover and companion crop recommendations, refer to Wisconsin Agronomy Technical Note 5, Establishing and Maintaining Native Grasses, Forbs, and Legumes; and Wisconsin Agronomy Technical Note 6, Establishing and Maintaining Introduced Grasses and Legumes.

**B. Criteria for Seed Mixture Development**

Seeding rates are based on seeds per square foot of Pure Live Seeds. Refer to Tables 3 and 4 for common species and seeding rates.

Additional approved species can be found in Wisconsin Agronomy Technical Note 5, Establishing and Maintaining Native Grasses, Forbs, and Legumes; and Wisconsin Agronomy Technical Note 6, Establishing and Maintaining Introduced Grasses and Legumes. Species not listed in the technical notes must be approved in advance by the State Agronomist.

a. Introduced Grass and Legume Plantings on Critical Sites

Custom and standard mixtures will comprise of at least 50 percent grass seed, consisting of at least 25 percent sod forming grass seed per square foot.

A minimum of 160 seeds per square foot is required for either a solid stand of grasses or a combination of grasses and legumes.

Increase seeding rate by 15 percent when dormant seeding occurs.

Standard mixes listed in Table 5 will meet the following criteria.

b. Native Herbaceous Plantings on Critical Sites

Native species are generally not recommended for critical area plantings due to their slow establishment and because they

are clump grasses, not the preferred sod-forming grasses. Native plantings are not permitted in concentrated flow channels.

- 1) A minimum of 60 seeds per square foot for solid native grass plantings is required.
- 2) For native grass and forb/legume mixtures, a minimum of 40 seeds per square foot of grass and a minimum of 20 seeds per square foot for the forb/legume component is required. The minimum of 20 forb/legume seeds per square foot is not required when the solid stand native grass mixture comprise of 60 grass seeds per square foot is utilized.

Up to 20 percent of the required grass seeds per square foot may comprise of Canada/Virginia wildrye and sideoats grama.

**C. Additional Criteria to Stabilize Stream Channel Banks and Shorelines**

Wisconsin FOTG Standard 580, Streambank and Shoreline Protection, shall be used to stabilize the toe and/or bank hydrologic zones before vegetation establishment.

1. Bank and Channel Slopes

Identify, mark, and protect desirable existing vegetation during practice installation.

On sites with a disturbed soil profile, topsoil will be stockpiled and spread over areas to be planted as needed to meet planting and landscaping needs.

Channel side slopes shall be shaped to a stable slope to facilitate establishment and maintenance of desired vegetation.

Slopes steeper than 2H:1V shall not be stabilized using vegetation alone. A combination of vegetative and structural measures will be used on these slopes to ensure adequate stability.

Grazing shall be permanently excluded on high hazard sites, such as cut banks, areas of seepage or other potentially unstable areas.

## 2. Species Selection

Plant material used for this purpose shall:

- be adapted to the hydrologic zone into which they will be planted.
- be adapted and proven in the regions in which they will be used.
- when mature, produce plant communities that are compatible with those already existing in the area.
- protect the channel banks but not restrict channel capacity.

### D. Additional Criteria to Stabilize Areas of Erosion By Wind and Water

1. The amount of plant biomass and cover needed to reduce wind and water erosion to the planned soil loss objective shall be determined using the current approved wind and/or water erosion prediction technology.
2. Do not use tillage where desirable vegetation is already present or where soil disturbance will increase the potential for erosion or cause sedimentation to environmentally sensitive areas.
3. Use a companion crop as added protection.

### E. Additional Criteria to Rehabilitate and Revegetate Degraded Sites That Cannot Be Stabilized Using Normal Establishment Techniques

Slope Stabilization

1. On sites that are too steep for regular seeding equipment to operate, the use of hydroseeding and mechanically blown

mulch is recommended. For more information regarding hydroseeding, refer to Wisconsin Agronomy Technical Note 6, Establishing and Maintaining Introduced Grasses and Legumes.

2. Grade to a stable slope when shaping and eliminate all overfalls. For slopes steeper than 2H:1V, enhanced stabilization activities such as soil bioengineering may be required. These practice concepts shall follow approved design procedures located in the NRCS Engineering Field Handbook, Chapter 18.
3. The toe of the slope, or the outlet of the concentrated flow channel, shall be stable before attempting seeding on the slope.
4. Concentrated flow may need to be diverted during establishment period.
5. All gullies and deep rills will be filled and leveled during seedbed preparation.
6. A minimum of 4 inches of friable soil material or topsoil shall be added and mixed to exposed rocky, sandy, gravelly, shaley material, or extremely fine textured subsoil.
7. Sod placement shall be limited to areas that can naturally supply needed moisture or sites that can be irrigated during the establishment period.
8. Sod will be placed and anchored using techniques to ensure that it remains in place until established.

**Figure 1**  
Planting Zones



**Table 1**  
Seeding Date/Ranges for Native Mixtures and Companion Crops

Zone	Spring Seeding
Northern	Thaw - 7/15
Central	Thaw - 6/30
Southern	Thaw - 6/30

**Table 2**  
Seeding Date/Ranges for Introduced Grasses, Legumes, and Companion Crops

Planting Zone	Spring	Late Summer	Dormant
North	5/1 - 6/15	7/15 - 8/10	11/1 - Freeze up
Central	4/15 - 6/1	8/1 - 8/21	11/1 - Freeze up
South	4/1 - 5/15	8/7 - 8/29	11/1 - Freeze up

## VI. Considerations

Additional recommendations relating to design that may enhance the use of, or avoid problems with, this practice but are not required to ensure its basic conservation functions are as follows.

- A. Minimize activities which disturb wildlife during the primary nesting season May 15 through August 1.
- B. Consider seeding at a lower rate and making 2 passes to ensure uniform coverage. Check seed boxes regularly to ensure even distribution.
- C. Heavy traffic and/or compacted soil areas may need special site preparation prior to seeding.
- D. Sprigs, root stocks, crowns, cones, culms, and sod may be considered where appropriate to accelerate the establishment of cover.
- E. Woody shrubs or trees may be used only after initial stabilization. Plant in accordance with the purpose of the planting. See WI FOTG Standards 612, Tree/Shrub Planting; and 580, Streambank and Shoreland Protection. Also see NRCS Engineering Field Handbook, Chapter 16, Streambank and Shoreline Protection and Chapter 18, Soil Bioengineering for Upland Slope Protection.
- F. Consider using carriers such as vermiculite, sawdust, and soybean meal to increase volume and weight for uniform seed distribution.
- G. Consider limited or no use of herbicides one year prior to seeding. If herbicides must be used, ensure there is no potential for carryover and follow label recommendations. Follow WI FOTG Standard 595, Integrated Pest Management, for pesticide use and safety.
- H. Consider sodding to establish vegetation on steep slopes. For further details on this special erosion control measure, refer to Wisconsin Agronomy Technical Note 6, Establishing and Maintaining Introduced Grasses and Legumes.
- I. Consider establishing a buffer of trees and/or grasses next to intermittent or perennial streams.
- J. Consider planting native vegetation and/or local *genotypes* when restoring riparian corridors to its pre-settlement conditions.

- K. High seed counts per square foot much above the recommended minimums may lead to excessive competition and poor establishment of some species. Seeds per square foot should not exceed 25 percent of the minimum requirement, with the exception of mixtures designed for wet mesic and wet sites.
- L. Consider the use of *soil bioengineering* techniques to arrest and prevent slope failures and erosion. For approved design procedures, refer to Chapter 18 of the NRCS Engineering Field Handbook (EFH).
- M. Consider alternatives to reduce or eliminate the delivery of sediment and associated pollutants into the riparian zone by implementing upland treatment practices.

## VII. Plans and Specifications

Prepare plans and specifications for each field or management unit according to the Criteria and Operation and Maintenance sections of this standard. Specifications shall describe the requirements for applying this practice to meet the intended purpose using the appropriate specification and/or job sheets. The following elements shall be addressed in the plan, as applicable, to meet the intended purpose.

- Site preparation.
- Fertilizer application.
- Methods of seeding/planting.
- Selection of species.
- Analysis of seed quality.
- Seeding rate (adjusted based on pure live seed calculations).
- Target number of plants per square foot after emergence.
- Mulching (if applicable).
- Temporary cover (if applicable).
- Companion crop (if applicable).

Specifications shall be recorded using Wisconsin Job Sheets 134, How to Establish and Maintain Introduced Grasses and Legumes; and 135, How to Establish and Maintain Native Grasses, Forbs, and Legumes.

## VIII. Operation and Maintenance

- A. Noxious weeds and other undesirable species must be controlled at all sites. During the first year, mow plantings at 14 to 21-day intervals or when weeds are 12-14 inches high. Mowing height should be 4 inches for introduced and 6

inches for native plants. Spot spraying or hand pulling may be needed for some invasive species such as thistles and purple loosestrife.

- B. Sites may require on-going periodic maintenance consisting of mowing, burning, or herbicide treatment. Small grain companion crops should be mowed prior to heading at boot stage.
- C. Sites should be inspected periodically to ensure objectives are being met.

## IX. References

Curtis, J. T. 1959. The Vegetation of Wisconsin: an ordination of plant communities. University of Wisconsin Press, Madison, Wisconsin.

Henderson, R. A. 1995. Plant Species Composition of Wisconsin Prairies: An Aid to Selecting Species for Plantings and Restorations Based Upon University of Wisconsin-Madison Plant Ecology Laboratory Data. Wisconsin Department of Natural Resources Technical Bulletin No. 188.

Ladd, D. and Oberle, F. 1995. Tallgrass Prairie Wildflowers, A Field Guide. The Nature Conservancy.

Nichols, S. and Entine, L. 1976. Prairie Primer. University of Wisconsin - Extension, publication G2736.

Packard, S. and Mutel, C. 1997. The Tallgrass Restoration Handbook for Prairies, Savannas and Woodlands. Society for Ecological Restoration.

Rock, H. W. 1971. Prairie Propagation Handbook. Boerner Botanical Gardens.

USDA, NRCS, National Engineering Handbook, Part 650, Engineering Field Handbook.

USDA, NRCS, Wisconsin Field Office Technical Guide (FOTG), Section IV, Practice Standards and Specifications.

USDA, NRCS, Wisconsin Agronomy Technical Note 5, Establishing and Maintaining Native Grasses, Forbs, and Legumes.

USDA, NRCS, Wisconsin Agronomy Technical Note 6, Establishing and Maintaining Introduced Grasses and Legumes.

USDA, NRCS, Wisconsin Job Sheet 134, How to Establish and Maintain Introduced Grasses and Legumes.

USDA, NRCS, Wisconsin Job Sheet 135, How to Establish and Maintain Native Grasses, Forbs, and Legumes.

## X. Definitions

*Actual Adjusted Seeding Rates (V.A.2.)* – an increase in seeds per square foot or pounds per acre, when the PLS is less than 100 percent.

*Aspect (V.A.1.)* – The exposure of the site to direct sunlight, prevailing winds, and other factors that influence plant growing conditions. For example, a north slope tends to be cooler and moister while a south-facing slope tends to be drier and warmer.

*Soil Bioengineering (VI.L.)* – Practice of combining mechanical, biological, and ecological concepts to arrest and prevent shallow slope failures and erosion.

*Certified Seed (V.A.2.)* – Seed that meets the standards established by the designated official seed certifying agency for the purpose of ensuring species/variety, species/variety purity and mechanical quality. The Wisconsin Crop Improvement Association is the official seed certifying agency for Wisconsin.

*Genotype (VI.J.)* – A group of individual plants which share a specified genetic makeup. For example, all big bluestem plants that are genetically adapted to grow and mature in the climatic conditions found in the driftless region could be considered a genotype.

*Introduced Species (V.A.4.)* – Plant species that historically were not native to North America and were brought here from other parts of the world, for example, smooth brome grass and alfalfa.

*Native Species (V.A.4.)* – Plants species that historically would have been found growing in North America such as big bluestem or green needle-grass.

*Non-Certified Seed (V.A.2.)* – Seed that is grown, processed, tested and labeled for species/variety and mechanical quality factors, but is not certified by an official seed certifying agency.

*Pure Live Seed (PLS) (V.A.2.)* – PLS is a means of expressing seed quality, based on the percentage of seed in a seed lot that is both pure and viable. PLS is calculated by multiplying the percentage of total viable seed (germination + hard seed + dormant seed) by the percentage of pure seed divided by 100.

*Untested Seed (V.A.2.)* – Seed that has no assurances of testing for species/variety and mechanical quality, i.e., species/variety purity, inert matter, other crop or weed seeds and germination potential. Untested seed legally cannot be labeled.

Table 3  
Common Species and Seeding Rates for Critical Area Plantings

Name	Scientific Name	Moisture Regime	Single Species Seeding Rate (PLS) Lbs./Ac.	Seeds/Lb.	Seeds/Square Ft./Lb./Ac.
<b>Native Grasses</b>					
Big Bluestem <sup>1</sup>	<i>Andropogon gerardii</i> <sup>1</sup>	DM, M, WM, W	11	165,000	3.8
Canada Wild Rye	<i>Elymus canadensis</i>	DM, M, WM	12	110,000	2.5
Indian Grass <sup>1</sup>	<i>Sorghastrum nutans</i> <sup>1</sup>	DM, M, WM, W	10	175,000	4.0
Little Bluestem	<i>Schizachyrium scoparium</i>	D, DM, M	8	261,360	6.0
Prairie June Grass <sup>1,2</sup>	<i>Koeleria macrantha</i> <sup>1,2</sup>	D, DM	0.5	2,300,000	53
Sideoats Grama	<i>Bouteloua curtipendula</i>	D, DM, M	8	191,664	4.4
Switch Grass <sup>1</sup>	<i>Panicum virgatum</i> <sup>1</sup>	DM, M, WM, W	7	393,000	9.0
Virginia Wild Rye	<i>Elymus virginicus</i>	M, WM, W	17	67,190	1.5
<b>Introduced Grasses</b>					
Creeping Red Fescue <sup>1,2</sup>	<i>Festuca rubra</i> <sup>1,2</sup>	D, DM	5	350,000	8
Festulolium	x <i>Festulolium</i> (M. Fescue, rye grass)	DM, M, WM	10	227,000	5.2
Italian or Annual Ryegrass	<i>Lolium multiflorum</i>	DM, M, WM	20	227,000	5.2
Kentucky Bluegrass <sup>1,2</sup>	<i>Poa pratensis</i> <sup>1,2</sup>	DM, M, WM, W	8	2,177,000	50
Orchard Grass	<i>Dactylis glomerata</i>	D, DM, WM, W	10	654,000	15
Perennial Ryegrass	<i>Lolium perenne</i>	DM, M, WM	20	227,000	5.2
Redtop <sup>2</sup>	<i>Agrostis alba</i> <sup>2</sup>	M, WM, W	4	4,990,000	114
Smooth Bromegrass <sup>1,2</sup>	<i>Bromus inermis</i> <sup>1,2</sup>	DM, M, WM	20	136,000	3.1
Tall Fescue <sup>1</sup>	<i>Festuca arundinacea</i> <sup>1</sup>	DM, M, WM	10	227,000	5.2
Timothy <sup>1</sup>	<i>Phleum pratense</i> <sup>1</sup>	M, WM, W	8	1,230,000	28.5
<b>Legumes</b>					
Alfalfa	<i>Medicago sativa</i>	D, DM, M	12	200,000	5.0
Alsike Clover	<i>Trifolium hybridum</i>	M, WM, W	3	700,000	16.1
Birdsfoot trefoil	<i>Lotus corniculatus</i>	M, WM, W	6	375,000	8.7
Ladino/White Clover	<i>Trifolium repens</i>	DM, M, WM	3	871,650	20
Red Clover	<i>Trifolium pratense</i>	DM, M, WM	10	275,000	6.0

<sup>1</sup> Species approved for seeding individually at the recommended Pure Stand Rates based on Pure Live Seeds (PLS) depending on the erosiveness of the site.

It is required that at least 50% of the seeds per square foot of mixtures planted to introduced and native species on critical areas are composed of grasses, and 25% of the seeds per square foot are sod-forming grasses for introduced species.

If more than 20% of the legume seed is hard seed, increase the seeding rate for legumes by the percent of hard seed.

Seeds per square foot for a particular specie can be calculated by multiplying the number of seeds per pound of the specie by the rate of the specie in pound(s) per acre divided by 43,560 square feet.

<sup>2</sup> Sod-forming grass plants.



Table 4  
Seeding Chart for Native Grass Species

Grass	Percent of Mixture	Pure Stand Seeding Rate	Seeds per Square Foot
Big Bluestem, <i>Andropogon gerardi</i>	0-100	11 lbs/ac	40
Canada Wildrye, <i>Elymus canadensis</i>	0-20	12 lbs/ac	30
Indian grass, <i>Sorghastrum nutans</i>	0-100	10 lbs/ac	40
Little Bluestem, <i>Schizachyrium scoparium</i>	0-20	8 lbs./ac	48
Sideoats Grama, <i>Bouteloua curtipendula</i>	0-20	8 lbs/ac	32
Switchgrass, <i>Panicum virgatum</i>	0-100	7 lbs/ac	63
Virginia Wild Rye, <i>Elymus virginicus</i>	0-20	17 lbs/ac	26
Prairie June Grass, <i>Koeleria macrantha</i>	0-20	0.5 lbs/ac	37
Hairy Grama, <i>Bouteloua hirsuta</i>	0-25	1 lb/ac	26

Canada Wild Rye, Virginia Wild Rye and Sideoats Grama when combined will not comprise of more than 20% of the total grass seeds per square foot. Pure stand seeding rates for Big Bluestem and Indiangrass must be increased by 5 lbs/acre to meet the minimum seeds per square foot as required by this standard. Refer to Table 3 for suggested moisture regimes per specie.

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**Table 5**  
**Seeding Mixtures Suitable for Critical Area Plantings**

Seed Calculator Code*	Moisture Regimes	Common Name	Scientific Name	Seeding Rate in lb/ac PLS	Seeding Rate in Seeds/Ft <sup>2</sup> PLS	Capacity Retardance	Type of Site**
342-1	Dry-Mesic and Mesic Sites	Smooth Bromegrass	Bromus inermis	10	30	B	EB, WW,CSB
		Creeping Red Fescue	Festuca rubra	3	24		
		Alfalfa	Medicago sativa	3	15		
		Red Clover	Trifolium pratense	3	18		
		Kentucky bluegrass	Poa pratensis	1.5	75		
342-1A	Dry-Mesic and Mesic Sites***	Smooth Bromegrass	Bromus inermis	15	46	B	EB,WW
		Alfalfa	Medicago sativa	7	35		
		Timothy	Phleum pratense	3	84		
342-1B	Dry-Mesic and Mesic Sites	Kentucky bluegrass	Poa pratensis	1	50	B	CSB, EB, WW
		Smooth Bromegrass	Bromus inermis	10	30		
		Timothy	Phleum pratense	2	57		
		Tall Fescue	Festuca arundinacea	2	10		
		Perennial Ryegrass	Lolium perenne	5	25		
342-1C	Dry-Mesic and Mesic Sites	Smooth Bromegrass	Bromus inermis	20	62	B	EB, WW, CSB
		Creeping Red Fescue	Festuca rubra	5	40		
		Alfalfa	Medicago sativa	8	40		
		Red Clover	Trifolium pratense	4	24		
342-1D	Dry-Mesic and Mesic Sites	Smooth Bromegrass	Bromus inermis	30	93	B	EB, WW, CSB
		Alfalfa	Medicago sativa	14	70		
342-2	Dry-Mesic, Mesic, and Wet Mesic Sites	Smooth Bromegrass	Bromus inermis	7	21	B	CSB, EB, WW
		Timothy	Phleum pratense	2	57		
		Creeping Red Fescue	Festuca rubra	1	8		
		Kentucky Bluegrass	Poa pratensis	1	50		
		Perennial Ryegrass	Lolium perenne	3	15		
		Red Clover	Trifolium pratense	3	18		
342-3	Mesic Sites***	Smooth Bromegrass	Bromus inermis	7	21	B	EB, WW
		Creeping Red Fescue	Festuca rubra	2	16		
		Kentucky bluegrass	Poa pratensis	3	150		
		Birdsfoot trefoil	Lotus corniculatus	2	18		
342-3A	Mesic Sites***	Smooth Bromegrass	Bromus inermis	15	45	B	WW,EB
		Creeping Red Fescue	Festuca rubra	2	16		
		Kentucky Bluegrass	Poa pratensis	2	100		
342-3B	Mesic Sites***	Kentucky Bluegrass	Poa pratensis	3	150	C	WW,EB
		Creeping Red Fescue	Festuca rubra	4	32		
		Perennial Ryegrass	Lolium perenne	10	50		
342-3C	Mesic Sites	Smooth Bromegrass	Bromus inermis	14	42	B	EB, WW, CSB
		Timothy	Phleum pratense	3	84		
		Red Clover	Trifolium pratense	3	18		
		Perennial Ryegrass	Lolium perenne	4	20		
342-3D	Mesic Sites	Smooth Bromegrass	Bromus inermis	32	99	B	EB, WW
		Creeping Red Fescue	Festuca rubra	8	64		
342-3E	Mesic Sites	Kentucky bluegrass	Poa pratensis	4	200	C	EB, WW
		Creeping Red Fescue	Festuca rubra	3	24		

Seed Calculator Code*	Moisture Regimes	Common Name	Scientific Name	Seeding Rate in lb/ac PLS	Seeding Rate in Seeds/Ft <sup>2</sup> PLS	Capacity Retardance	Type of Site**
342-3F	Mesic Sites	Smooth Bromegrass	Bromus inermis	14	43	B	EB, WW, CSB
		Timothy	Phleum pratense	4	112		
		Red Clover	Trifolium pratense	3	18		
342-3G	Mesic Sites	Smooth Bromegrass	Bromus inermis	14	43	B	EB, WW, CSB
		Timothy	Phleum pratense	1	112		
		Alsike Clover	Trifolium hybridum	2	32		
342-3H	Mesic Sites	Smooth Bromegrass	Bromus inermis	14	43	B	EB, WW
		Timothy	Phleum pratense	4	112		
		Birdsfoot trefoil	Lotus corniculatus	3	26		
342-4A	Wet Mesic Sites	Tall Fescue	Festuca arundinacea	5	25	B	CSB, EB, WW
		Timothy	Phleum pratense	3	84		
		Perennial Ryegrass	Lolium perenne	3	15		
		Red Clover	Trifolium pratense	3	18		
		Smooth Bromegrass	Bromus inermis	6	18		
		Kentucky Bluegrass	Poa pratensis	2	100		
342-4C	Wet Mesic Sites	Redtop	Agrostis alba	1	114	C	WW, CSB, EB
		Timothy	Phleum pratense	3	84		
		Red Clover	Trifolium pratense	5	30		
342-4B	Wet Mesic Sites	Timothy	Phleum pratense	3	84	B	WW, CSB, EB
		Perennial Ryegrass	Lolium perenne	3	15		
		Red Clover	Trifolium pratense	3	18		
		Smooth Bromegrass	Bromus inermis	6	18		
		Kentucky Bluegrass	Poa pratensis	2	100		
342-7	Wet Mesic Sites	Redtop	Agrostis alba	1	114	C	WW, CSB, EB
		Timothy	Phleum pratense	1	28		
		Red Clover	Trifolium pratense	4	24		
		Kentucky Bluegrass	Poa pratensis	2	100		
342-8	Wet Sites***	Redtop	Agrostis alba	2	228	C	WW
		Alsike Clover	Trifolium hybridum	2	32		
		Kentucky Bluegrass	Poa pratensis	2	100		
342-8A	Wet Mesic Sites	Redtop	Agrostis alba	3	342	C	WW
		Alsike Clover	Trifolium hybridum	3	48		

\*These codes represent the mixtures used in the Wisconsin Seed Calculator.

\*\*EB = Embankments; WW = Waterways; CSB = Channel and Streambanks

\*\*\*Mixtures can be used on other site descriptions when not listed.