United States Department of Agriculture
Natural Resources Conservation Service
200 North High Street, Room 522
Columbus, Ohio 43215

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In Consultation with NRCS Conservation Partners

APPENDIX A – SEEDING TABLES

Purchasing Quality Seed:

Select species of grasses, legumes and forbs which are compatible with one another and suitable for the site conditions. Some species do better on drier soils while others will flourish on wetter soils.

Use seed from a reputable vendor that is registered with the Ohio Department of Agriculture (ODA). Be sure that the purchased seed is labeled according to ODA regulations and the Ohio Revised Code. Seed tags should contain at a minimum, the lot number, the kind and variety of seed, the percent of pure seed, the percent germination, the percent dormant or hard seed and the name and amount of noxious weeds contained in the mix. This information is necessary to calculate the Pure Live Seed (PLS) and the appropriate seeding rate.

If there is any question about the quality of seed or if the seed is not labeled properly, it should be returned to the vendor or it can be sampled and tested by:

Ohio Department of Agriculture
Division of Plant Industry – Grain, Feed and Seed Section
8995 E. Main Street
Reynoldsburg, Ohio 43068
614-728-6410

Calculating Pure Live Seed (PLS) and Seeding Rates:

Almost all seed has some non-viable as well as "hard" or dormant seed. Seeding rates should be adjusted to compensate for the seed that will not germinate. Warm season grasses are usually purchased on a Pure Live Seed basis. This means that if you purchase 50 lbs of PLS, you will probably get shipped a bag containing more than 50 lbs of material. PLS is calculated as follows:

% PLS= % Pure Seed x (% Germination+ % Dormant seed)

For example: If you ordered 50lbs of pure live big bluestem seed and the seed tag states:

Lot number 745-HG	
Kind	Big Bluestem
Pure Seed	99.0%
Germination	72%
Dormant (Hard) Seed	10%
Weed Seed	.5%
Noxious Weed Seed	0.0%

PLS Calculation:

% PLS= % Pure Seed [99] x (% Germination [72] + % Dormant seed [10])
% PLS= [.99] x ([.72] + [.10])
% PLS= .99 x .82
% PLS= .81
Or Pure Live Seed = 81 %
50 lbs PLS divided by .81 = 61.2 lbs

Your "50 lb" bag of big bluestem seed should weigh 61.2 lbs as shipped.

Seeding Rate Adjustment for PLS:

So if the recommended seeding rate is 6 lbs/acre of PLS you need to adjust your actual rate planted:
6 lbs PLS/acre divided by .81 (PLS) = 7.4 lbs/acre.
In other words you would need to plant 7.4 lbs/acre of the seed in the bag to get 6 lbs/acre of pure live big bluestem seed. The material in the bag should cover 8.3 acres.

Section 1 - Table 1. Agronomic Adaptation and Characteristics of Grasses and Legumes

(Source OSU Bulletin 472 - Ohio Agronomy Guide 14th Edition)

Species	Minimum Adequate Drainage/1	Tolerance to pH < 6.0	Adequate Soil Fertility	Drought Tolerance	Persistence	Seedling Vigor	Growth Habit
Legumes/5							
Alfalfa	WD	Low	High to medium	High	High	High	Bunch
Alsike clover	PD	High	Medium to low	Low	Low	Low	Spreading
Birdsfoot trefoil	SPD	High	Medium	Medium	Medium	Low	Low Bunch
Kura clover	PD	Medium	Medium	Medium	High	Low	Spreading
Red clover	SPD	Medium	Medium	Medium	Low High	Low	Bunch
White clover	PD	Medium	Medium	Low	High	Low	Spreading
Lespedeza, serica /I3	SPD	High	Medium to low	High	High	Medium	Bunch
Crownvetch	WD	Medium	Medium	High	High	Low	Spreading
Sweetclover	WD	Low	High to medium	High	Biennial	Medium	Bunch
Cool-Season Grasses and Forbs							
Annual ryegrass	SPD	Medium	Medium	Low	Low	High	Bunch
Festulolium	SPD	Medium	Medium to high	Low	Low	Very high	Bunch
Garrison creeping foxtail	VPD	High	Medium to high	High	High	Low	Open sod
Kentucky bluegrass	SPD	Medium	Medium	Low	High	Low	Dense Sod
Orchardgrass	SPD	Medium	Medium	Medium	Medium	High	Bunch
Perennial ryegrass	SPD	Medium	Medium to high	Low	Low	Very high	Bunch
Reed canarygrass/I3	VPD	High	Medium to high	High	High	Low	Open sod
Smooth bromegrass	MWD	Medium	High	High	High	Medium	Open sod
Tall fescue/I3	SPD	High	Medium	Medium	High	High	Variable[2]
Timothy	MWD	Medium	Medium	Low	High	Low	Bunch
Forage Chicory	MWD	Medium	Medium to high	High	Medium	High	Bunch
Warm-Season Grasses							
Switchgrass	SPD	High	Low to medium	Excellent	High	Very low	Bunch
Big bluestem	MWD High	Low to medium	Excellent	High	Very low	Very low	Bunch
Little bluestem	MWD	Low to medium	Excellent	High	Low	Very low	Bunch
Indiangrass	MWD	High	Low to medium	Excellent	High	Very low	Bunch
Eastern gamagrass	PD	High	Medium to high	Good	High	Very low	Bunch

/1 Minimum drainage required for acceptable growth:
WD = well drained; MWD = moderately well drained; SPD = somewhat poorly drained; PD = poorly drained; VPD = very poorly drained.

/2 Under lax cutting, tall fescue has bunchy growth; under frequent cutting or grazing, it forms a sod.

/I3 = Invasive without proper management

/5 Be sure to treat legume seed (thereby the soil) with the proper inoculant prior to seeding.

Section 1 - Table 2: Planting Dates, Depths and Suitable Uses for Cool Season Grasses and Legumes
(Reference OSU Bulletin 472 - Ohio Agronomy Guide 14th Edition and NRCS Specifications)

Forage Species		Suitable Uses in Mixes									Northern Ohio/5	Southern Ohio/5
	Planting Depth (in.)/3	Conservation Cover	Cover Crop	Critical Area	Filter Strip	Forage	Heavy Use	Waste Filter	Waterway	Vegetative Barriers	Seeding Dates/1	Seeding Dates/1
Legumes/6												
Alfalfa/2	¼ in	X	X			X					4/1–5/1 or 8/1–8/15	3/20–4/25 or 8/1–8/30
Alsike clover	¼ in	X				X					2/1–5/1 or 7/20–8/30	2/1–4/25 or 8/1–9/15
Austrian Winter Pea	1in		X								7/20–8/30	7/20–9/15
Birdsfoot trefoil	¼ in	X				X					4/1–5/1	3/20–4/25
Crownvetch	¼ in	X		X		X				X	4/1–5/1	3/20–4/25
Hairy Vetch	¼ in		X								8/1–9/15	8/1–9/15
Kura clover	¼ in	X	X			X					4/1–5/1	3/20–4/25
Red clover/2	¼ in	X	X			X					2/1–5/1 or 7/20–8/30	2/1–4/25 or 8/1–9/15
Sweet Clover	¼ in		X								2/1–5/1 or 7/20–8/30	2/1–4/25 or 8/1–9/15
White clover/2	¼ in	X	X			X					2/1–5/1 or 7/20–8/30	2/1–4/15 or 8/1–9/15
Perennial Cool Season Grasses and Forbs												
Fescue, Creeping Red	¼ in			X	X		X		X		3/15–5/1 or 8/1–9/15	3/1–4/20 or 8/1–9/15
Fescue, Tall /I3	¼ in			X	X	X	X	X	X	X	3/15–5/1 or 8/1–9/15	3/1–4/20 or 8/1–9/15
Fescue, Turf-Type Tall	¼ in			X	X		X	X	X	X	3/15–5/1 or 8/1–9/15	3/1–4/20 or 8/1–9/15
Festulolium	¼ in	X			X	X					3/15–5/1 or 8/1–9/15	3/1–4/20 or 8/1–9/15
Garrison creeping foxtail	¼ in	X		X	X	X	X	X	X	X	3/15–5/1 or 8/1–9/15	3/1–4/20 or 8/1–9/15
Kentucky bluegrass	¼ in	X		X	X	X			X		3/15–5/1 or 8/1–9/15	3/1–4/20 or 8/10–9/15
Orchardgrass	¼ in	X		X	X	X					3/15–5/1 or 8/1–9/15	3/1–4/20 or 8/1–9/15
Perennial ryegrass	¼ in			X	X	X	X		X		3/15–5/1 or 8/1–9/15	3/1–4/20 or 8/1–9/15
Reed canarygrass /I3	¼ in					X		X			3/15–5/1	3/1–4/20
Smooth bromegrass	¼ in				X	X			X		3/15–5/1 or 8/1–9/25	3/1–4/20 or 8/1–9/25
Timothy	¼ in	X			X	X				X	3/15–5/1 or 8/1–9/15	2/15–4/20 or 8/1–9/15
Wildrye, Canadian	¼ in	X			X	X				X	3/15–5/1 or 8/1–9/15	3/1–4/20 or 8/1–9/15
Wildrye, Virginia	¼ in	X			X	X				X	3/15–5/1 or 8/1–9/15	3/1–4/20 or 8/1–9/15

/1 Dormant Seeding from Dec 1 to Mar 14 (cool season species) and Nov 1 to Mar 14 (warm season species)
Increase seeding rates by 25% for dormant seedings.

/2 February to early March is the recommended frost seeding period for this species

/3 Planting depth is critical for successful establishment. Many failures result from planting too deeply.

/I3 Invasive without proper management

/5 Northern Ohio = Generally North of I70 - Southern Ohio = South of I70

/6 Be sure to treat legume seed (thereby the soil) with the proper inoculant prior to seeding.

Section 1 - Table 3: Planting Dates, Depths and Uses for Perennial Warm Season Grasses and Annuals
(Reference OSU Bulletin 472 - Ohio Agronomy Guide 14th Edition and NRCS Specifications)

Forage Species		Suitable Uses in Mixes									Northern Ohio/4	Southern Ohio/4
	Planting Depth (in.)/2	Conservation Cover	Cover Crop	Critical Area	Filter Strip	Forage	Heavy Use	Waste Filter	Waterway	Vegetative Barriers	Seeding Dates/1	Seeding Dates/1
Perennial Warm Season Grasses, Legumes/5 and Forbs												
Big bluestem	¼ in	X			X	X				X	4/1 – 6/1	4/1 – 6/1
Caucasian bluestem /I3	¼ in					X					4/1 – 6/1	4/1 – 6/1
Little bluestem	¼ in	X			X	X				X	4/1 – 6/1	4/1 – 6/1
Eastern gamagrass	½ in	X			X	X		X		X	4/1 – 6/1	4/1 – 6/1
Indiangrass	¼ in	X			X	X				X	4/1 – 6/1	4/1 – 6/1
Sideoats Grama	¼ in	X									4/1 – 6/1	4/1 – 6/1
Switchgrass	¼ in	X			X	X		X		X	4/1 – 6/1	4/1 – 6/1
Lespedeza, sericea /5 /I3	¼ in	X				X					4/1 – 6/1	4/1 – 6/1
Forage Chicory	¼ in	X				X					4/1–5/1 or 8/1 – 8/20	3/15–4/20 or 8/1 – 8/30
Annuals												
Annual ryegrass /3	½ in		X	X	X	X			X		3/15 – 5/1 or 7/20–9/15	3/1–4/20 or 7/20–9/15
Pearl millet	¼ in					X					5/15 – 7/5	5/1–7/15
Brassicas	¼ in		X			X					4/1 –5/1 or 7/20 - 8/30	3/15–4/20 or 8/1 - 9/15
Hairy Vetch	¼ in		X			X					8/1 – 9/15	8/1– 9/15
Lespedeza, annual /5	¼ in	X				X					3/1 – 5/1	3/1 – 5/1
Oats, cereal	1in		X			X					3/1 - 4/15 or 8/1 - 9/05	3/1 - 4/15 or 8/1 - 9/15
Oilseed Radish	¼		X								8/15 – 9/05	8/15 - 9/15
Rye, cereal	1in		X			X					8/1 - 11/1	8/1- 11/1
Sorghum, forage	¼ in					X					5/15 – 7/5	5/1– 7/15
Sorghum-sudangrass	¼ in		X			X					5/15 – 7/5	5/1– 7/15
Soybeans	1.5 in		X			X					5/1- 8/1	5/1- 8/1
Wheat, winter /6	1in		X			X					9/22 - 10/10	9/22 - 10/10

/1 Dormant Seeding from Dec 1 to Mar 14 (cool season species) and Nov 1 to Mar 14 (warm season species)
Increase seeding rates by 25% for dormant seedings.

/2 Planting depth is critical for successful establishment. Many failures result from planting too deeply.

/I3 = Invasive without proper management

/3 Annual ryegrass if allowed to go to seed can be very competitive with wheat and provide limited control options

/4 Northern Ohio = Generally North of I70 - Southern Ohio = South of I70

/5 Be sure to treat legume seed (thereby the soil) with the proper inoculant prior to seeding.

/6 Do not plant until after the Hessian fly free date: Varies from Sept 22 in Northern Ohio to Oct 5 in Southern Ohio.
See the Ohio Agronomy Guide for specific date.

Section 1 - Table 4: Broadcast Seeding Warm Season Grasses: 1) Field Preparation and Planting

Ground Cover Prior to Planting	Seedbed Preparation and Seeding	Timing	Comments
Bare ground or Soybean Stubble	1) Till and level ground if needed using: • Light Disk and/or • Field Cultivator (or similar tool)	Between April 1st and June 1st.	Soil should be firm enough that your footprint is no deeper than ½ inch.
	2) Culti-pack to firm seedbed		
	3) Broadcast WSG/Forb seed		See Section 1 Table 5: Broadcasting Methods below
	4) Culti-pack again for seed to soil contact.		
	5) Apply ALS inhibiting herbicide (Plateau) if needed.	Prior to WSG emergence	
	6) Control weed competition.	May-September	
Corn or Wheat Stubble	1) Bale wheat straw or corn fodder	After harvest of crop	Soil should be firm enough that your footprint is no deeper than ½ inch.
	2) Till ground using: • Disk and/or • Field Cultivator (or similar tool)	Between April 1st and June 1st.	
	3) Culti-pack to firm seedbed		
	4) Broadcast WSG/Forb seed		See Section 1 Table 5: Broadcasting Methods below
	5) Culti-pack again for seed to soil contact.		
	6) Apply ALS inhibiting herbicide (Plateau) if needed.	Prior to WSG emergence	
	7) Control weed competition.	May-September	
Grassland or Pastureland	1) Spray cool season grass or pasture with Glyphosate (Roundup or Journey) in fall of the previous year	September of Previous year	Spray while grass is still actively growing.
	2) If field is not highly erodible, prepare the field using a primary tillage implement to destroy old sod.	Between April 1st and June 1st.	Soil should be firm enough that your footprint is no deeper than ½ inch.
	3) Level ground using: • Light Disk and/or • Field Cultivator (or similar tool)		
	4) Culti-pack to firm seedbed		
	5) Broadcast WSG/Forb seed		See Section 1 Table 5: Broadcasting Methods below
	6) Culti-pack again for seed to soil contact.		
	7) Apply ALS inhibiting herbicide (Plateau) if needed.	Prior to WSG emergence	
	8) Control weed competition.	May-September	

Any mention of trade names such as Roundup, Journey, and Plateau, does not constitute an endorsement of those products. Consult your farm product supplier for equivalent herbicides. Always read and follow label directions.

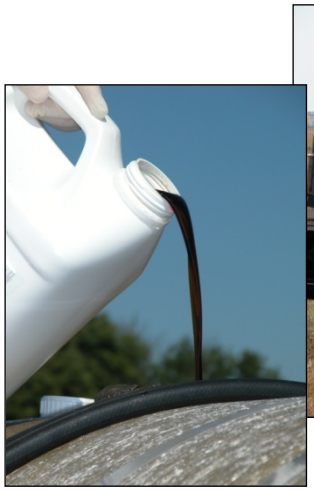
Section 1 - Table 5: Broadcast Seeding Warm Season Grasses: 2) Broadcasting Methods:

Depending on the kind of seed, broadcasting warm season grass seed can be challenging. Hard seed like switchgrass or eastern gamagrass are easy to broadcast with a spinner broadcast spreader. Bearded fluffy seeds such as big bluestem, little bluestem, and Indiangrass are much more challenging. This section is intended to identify some methods for broadcasting these seeds uniformly across the field. The seedbed must be properly prepared for a broadcast seeding. See Section 1) Field Preparation and Planting above.

Broadcast Equipment	Method	Hints /Tips
Commercial Fertilizer Truck or Fertilizer Spreader	Have fertilizer dealer mix WSG seed with carrier: • Lime at a rate of 500 lbs / acre **Or** • Phosphorus or Potash Fertilizer at a rate of 200 lbs / acre. **DO NOT USE NITROGEN FERTILIZER!** Some producers have the fertilizer dealer also mix water with the phosphorus or potash fertilizer at a rate of 5 gallons per ton of fertilizer to help the WSG seed stick to the fertilizer pellets.	Can be used to seed large acreage. The WSG will not broadcast as far as the carriers. You must overlap to ensure even coverage. Nitrogen fertilizer will stimulate cool season grasses and weeds. If water is used in the mix, the WSG seed should be carried with the fertilizer pellets and overlapping should not be as important. Broadcast immediately so that the water/fertilizer do not dry and cake.
Spinner Type Seeder with Agitator	Spinner type seeders with multiple vanes and a spreading disk can throw bearded seed 8-12 feet without a carrier. The bearded seed will lock together the smaller legumes and fine seed. (See tips to ensure even coverage) **Or** Have seed dealer mix the WSG with carrier: • Cracked wheat or oats at a rate of 1 bu/acre **Or** • 50 lbs of pelletized lime per acre	Can be used to seed medium to large acreage. **Calibrate seeder by adding one acre of seed to the seeder and plant a 206' x 206' area. Adjust seed flow settings accordingly.** Cracked wheat will not germinate **One tip is to cut the seeding rate in half and go over the seeding area twice in opposite directions.**
Conventional Cyclone Seeder or WSG Hand Broadcaster	Use debearded seed with a conventional Cyclone type seeder. **Or** Hand WSG broadcast seeders are specially designed with picker wheels at the base of the box to help pull the seed down into the spinner.	Limited to small to medium size acreage **You must overlap to ensure even coverage. One tip is to cut the seeding rate in half and go over the seeding area twice in opposite directions.**
Broadcast by Hand	Seed is thrown upward into a slight breeze to let the wind scatter the seed. Care must be taken to broadcast uniformly. Increase seed rate by 50%.	Limited to very small areas **You must overlap to ensure even coverage.**

Section 1 - Table 6: No-Till Seeding Method

Ground Cover Prior to Planting	Seedbed Preparation and Seeding (Assumes a smooth soil surface)	Timing	Comments
Row Crop	1) Use a labeled nonselective burndown herbicide such as Glyphosate to control existing vegetation.	At least two weeks prior to seeding	Follow all label directions when applying herbicides.
	2) Apply the necessary lime and fertilizer	Prior to seeding or through the drill at seeding.	
	3) Plant using a drill designed for no-till seeding.	Use seeding dates in Table 2 and 3 above	Calibrate the drill and seed ¼ inch deep with a drill designed for no-till seeding. Warm season grasses will require a WSG drill.
Existing Sod	1) Spray sod with a nonselective burndown herbicide such as Glyphosate in fall of the previous year. If perennial broadleafs are a concern add 1 pint 2, 4-D per acre to the nonselective burndown herbicide	Mid September to Early October of Previous year	Spray while vegetation is still actively growing.
	2) Apply the second application of nonselective burndown herbicide.	At least one week before seeding.	Follow all label directions when applying herbicides.
	3) Apply the necessary lime and fertilizer	Prior to seeding or through the drill at seeding.	
	4) Plant using a drill designed for no-till seeding.	Use seeding dates in Section 1- Table 2 and 3 above	Calibrate the drill and seed ¼ inch deep with a drill designed for no-till seeding. Warm season grasses will require a WSG drill.



Section 1 - Table 7: Conventional Seeding Method

Ground Cover Prior to Planting	Seedbed Preparation and Seeding	Timing	Comments
Row Crop, Small Grain, Existing Sod	1) Till and level ground if needed using: • Plow, Chisel and/or • Light Disk and/or • Field Cultivator (or similar tool)	Initial tillage (plow, chisel, disk) should begin at least a month prior to seeding. Wait 2 weeks between initial tillage and final seedbed preparation	To allow weed seeds to germinate and be killed by final seedbed preparation.
	2) Apply the necessary lime and fertilizer	After initial tillage but before seedbed preparation.	
	3) Culti-pack to firm seedbed	Prior to Seeding	A firm seedbed is important when seeding grasses and legumes.
	4) Apply nonselective burndown herbicide such as Glyphosate if needed to control perennial weeds.	At least one week before seeding.	Follow all label directions when applying herbicides.
	5) Plant using a drill with press wheels designed for the type of seed being used. (Culti-pack after seeding if broadcasting seed or drill is not equipped with press wheels).	Use seeding dates in Section 1 -Table 2 and 3 above	Calibrate the drill and seed ¼ inch deep. Warm season grasses will require a WSG drill.

Section 2 - Table 1: Seeding Rates of Pure Live Seed (PLS) for Forages Grown in Ohio

(Source OSU Bulletin 472 - Ohio Agronomy Guide 14th Edition)

Species[/1]	Seeds/lb	Pure Stand Seeding Rate[/2A,/2B]		Proportional Seeding Rates for Mixtures[/1]				
				3/4	1/2	1/3	1/4	1/8
	(x 1000)	(seeds/ft^2)	(lb/A)	lb/A				
Perennial Legumes[/1]								
Alfalfa	227	80	15	12	8	5	4	2
Alsike clover	700	150	9	7	5	3	2	1
Birdsfoot trefoil	375	80	9	7	5	3	2	1
Lespedeza, Sericea **/I3 / 4**	350	160	20	15	10	7	5	2.5
Kura clover	227	30	6	4	3	2	1.5	1
Red clover	275	70	11	8	6	4	3	1.5
White clover	860	100	5	4	3	2	1	0.5
Perennial Grasses and Forbs								
Festulolium	227	130	25	19	12	8	6	3
Garrison creeping foxtail	750	103	6	4	3	3	1.5	1
Kentucky bluegrass	2200	500	10	7	5	3	2	1
Orchardgrass	590	130	10	7	5	3	2	1
Perennial ryegrass	237	130	24	18	12	8	6	3
Reed canarygrass **/I3 /5**	550	130	10	7	5	3	2	1
Smooth bromegrass	137	50	16	12	8	5	4	2
Tall fescue **I3 /5**	227	80	15	12	8	5	4	2
Timothy	1230	220	8	6	4	3	2	1
Big bluestem	150	40	12	9	6	4	3	1
Caucasian bluestem **/I3**	860	39	2	1.5	1	.7	.5	.25
Little bluestem	255	60	10	7	5	3	2.5	1
Eastern gamagrass	7.4	1.5	9	7	4	3	2	1
Indiangrass	175	50	12	9	6	4	3	1.5
Switchgrass	370	80	9	7	5	3	2	1
Forage Chicory	375	50	6	4	3	2	1.5	1
Annuals and Biennials								
Annual ryegrass **/3**	228	125	24	18	12	8	6	3
Annual Lespedeza	240	154	28	21	14	9	7	4
Kale, Turnips	190-140	8-12	2-4	–	–	–	–	–
Pearl millet	85	40	20	–	–	–	–	–
Oats, spring	15	30	87	65	44	29	22	11
Rye, wheat, triticale, winter	18	45	109	–	–	–	–	–
Sorghum, forage	28	8	12	–	–	–	–	–
Sorghum-sudangrass	28	15	23	–	–	–	–	–

/1 Up to (2) legumes and/or three (3) grasses suitable for site conditions may be mixed at pro- rated rates. Be sure to treat legume seed (thereby the soil) with the proper inoculant prior to seeding.

/2A Dormant Seeding: Dec 1 to Mar 14 (cool season species) and Nov 1 to Mar 14 (warm season species) Increase rates by 25%.

/2B Under “less than ideal” seeding conditions, increase rates by 25% (50% if dormant seeding)

/I3 = Invasive without proper management

/3 Annual ryegrass if allowed to go to seed can be very competitive with wheat with limited control options

/4 The condensed tannins in sericea lespedeza have shown to control internal parasites in small ruminants such as sheep and goats. Consider planting a variety developed specifically for haying / grazing such as AU Grazer.

/5 Consider planting low alkaloid varieties or endophyte free varieties.

Section 2 - Table 2: Suitability of Forage Species to Different Soil Fertility Classes and Methods of Utilization. (Source OSU Bulletin 472 - Ohio Agronomy Guide 14th Edition)

Medium to high fertility soils, for hay and silage	
Legume CSG WSG	Alfalfa, birdsfoot trefoil, crownvetch, red clover Festulolium, orchardgrass, perennial ryegrass, reed canarygrass, smooth bromegrass, tall fescue, timothy Switchgrass, big bluestem, Indiangrass
Medium to high fertility soils, pasture production	
Legume CSG WSG	Alfalfa, alsike clover, birdsfoot trefoil, Kura clover, red clover, white clover, chicory Festulolium, Kentucky bluegrass, orchardgrass, perennial ryegrass, smooth bromegrass, tall fescue, timothy Switchgrass, big bluestem, Indiangrass, eastern gamagrass
Low to medium fertility soils, for hay and silage	
Legume CSG WSG	Red clover, alsike clover, birdsfoot trefoil Orchardgrass, tall fescue, timothy Switchgrass, big bluestem, Indiangrass
Low to medium fertility soils, pasture production	
Legume CSG WSG	Alsike clover, birdsfoot trefoil, Kura clover, white clover Kentucky bluegrass, orchardgrass, tall fescue Switchgrass, big bluestem, Indiangrass

Section 2 - Table 3: Suitability of Perennial Forages to Different Management and Growth Characteristics
(Source OSU Bulletin 472 - Ohio Agronomy Guide 14th Edition)

Species	Frequent, Close Grazing	Rotational Grazing	Stored Feed	Periods of Primary Production	Relative Maturity/1
Legumes					
Alfalfa	NR	S	HS	Spring, summer, early fall	Early-medium
Alsike clover	NR	S	S	Spring, early summer, fall	Late
Birdsfoot trefoil	NR	HS	HS	Spring, summer, early fall	Medium-late
Lespedeza, sericea /I3 /5	S	HS	S		
Kura clover	S	HS	NR	Spring, early summer, early fall	Medium-late
Red clover	NR	S	NR/3	Spring, summer, early fall	Medium-late
White dutch clover	HS	HS	NR	Spring and fall	Early-medium
White clover, ladino	NR	HS	S	Spring, early summer, fall	Early-medium
Cool-Season Grasses and Forbs					
Festulolium	NR /4	HS	HS /3	Spring, early summer, fall	Medium
Garrison creeping foxtail	S	HS	HS	Spring, summer, fall	Early-medium
Kentucky bluegrass	HS	HS	S	Early spring and late fall	Early
Orchardgrass	NR /4	HS	HS	Spring, summer, fall	Early-medium
Perennial ryegrass	NR /4	HS	S/3	Spring and fall	Medium
Reed canarygrass /I3 /6	NR	HS	HS	Spring, summer, fall	Medium-late
Smooth bromegrass	NR	S	HS	Spring, summer, fall	Medium-late
Tall fescue /I3 /6	NR	HS	HS	Spring, summer, fall	Medium-late
Timothy	NR	S	HS	Late spring and fall	Late
Forage Chicory	NR	HS	NR	Spring, summer	Early
Warm-Season Grasses					
Switchgrass	NR	HS	HS	Summer	Very late
Big bluestem	NR	HS	HS	Summer	Very late
Caucasian bluestem /I3	NR	S	S	Summer	Very late
Little bluestem	NR	HS	HS	Summer	Very late
Indiangrass	NR	HS	HS	Summer	Very late
Eastern gamagrass	NR	HS	S	Summer	Very late

/1 Relative time of flower or seedhead appearance in the spring. Depends on species and variety. Warm-season grasses mature in midsummer; exact time varies by species.

HS = Highly suitable | S = suitable | NR= not recommended

/3 Silage preferred; difficult to cure for dry hay.

/4 Can tolerate frequent grazing if three- to four-inch stubble is maintained.

/I3 = Invasive without proper management

/5 The condensed tannins in sericea lespedeza have shown to control internal parasites in small ruminants such as sheep and goats. Consider planting a variety developed specifically for haying / grazing such as AU Grazer.

/6 Consider planting low alkaloid varieties or endophyte free varieties.

Section 2 - Table 4: Examples of Nitrogen Rates Recommended for: Perennial Cool-Season Grass Forages/Biomass

(Source OSU Bulletin 472 - Ohio Agronomy Guide 14th Edition)

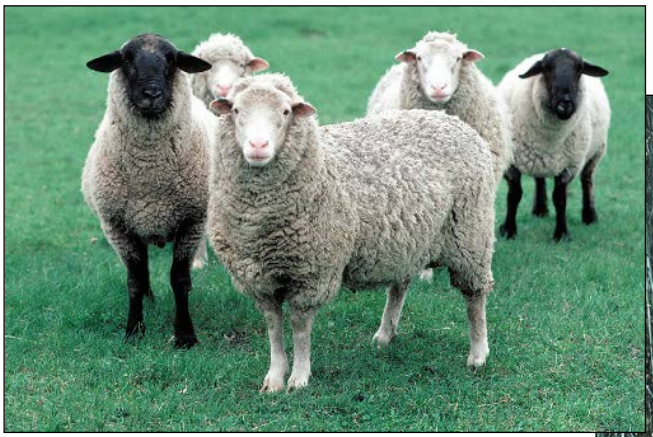
Crop, percent legume	Yield Potential, ton/acre		
	4	6	8
	Annual Application (lb N per acre/1)		
Tall grass, less than 20% legume	100	140	180
Mixed tall grass-legume, 20-35% legume	50	90	130
Mixed tall grass-legume, greater than 35% legume	0	0	0
/1 Make split applications of N in the early spring and after first harvest. Liquid N should be applied in early spring or immediately following forage removal.			

Section 2 - Table 5: Annual Phosphate (P2O5) Recommendations for: Forage Pure Grass Stands

Includes Maintenance Plus Four-Year Buildup to the Critical Level Where Needed

(Source OSU Bulletin 472 - Ohio Agronomy Guide 14th Edition)

Soil P Test Level ppm (lb/acre)	Yield Potential (ton/acre)		
	4	6	8
	lb P_2O_5 per Acre		
5 (10) /1	100	135	140
10 (20)	75	110	115
15-30 (30-60) /2	50	85	90
35 (70)	25	45	45
40 (80)	0	0	0
/1 Values in parentheses are lb/acre.			
/2 Maintenance recommendations are given for this soil test range.			
pH and base fertility should be corrected six (6) months and/or the planting season prior to seeding establishment based on soil test results			



Section 2 - Table 6: Annual Phosphate (P_2O_5) Recommendations for: Forage/Biomass Legume or Forage/Biomass Legume-Grass Mixtures

Includes Maintenance Plus Four-Year Buildup to the Critical Level Where Needed

(Source OSU Bulletin 472 - Ohio Agronomy Guide 14th Edition)

Soil P Test Level ppm (lb/acre)	Yield Potential (ton/acre)		
	4	6	8
	lb P_2O_5 per acre		
10 (20) /1	130	160	190
15 (30)	100	135	160
20 (40)	75	110	135
25-40 (50-80) /2	50	85	110
45 (90)	25	45	50
50 (100)	0	0	0
/1 Values in parentheses are lb/acre.			
/2 Maintenance recommendations are given for this soil test range.			
pH and base fertility should be corrected six (6) months and/or the planting season prior to seeding establishment based on soil test results			

Section 2 - Table 7: Annual Potassium (K2O) Recommendations for: Forage/Biomass Grass Only, Forage/Biomass Legume Only, and Forage/Biomass Legume-Grass Mixtures

Includes Maintenance plus Four-Year Buildup to the Critical Level Where Needed.

(Source OSU Bulletin 472 - Ohio Agronomy Guide 14th Edition)

Soil Test K Level ppm (lb/acre)		Yield Potential (ton/acre)		
		4	6	8
		lb K_2O per Acre		
	CEC	10 meq/100 g		
75 (150) /1		260	300[2]	300
100-130 (200-260) /3		220	300	300
140 (280)		40	60	80
150 (300)		0	0	0
	CEC	20 meq/100 g		
100 (200)		270	300	300
125-155 (250-310) /3		220	300	300
165 (330)		40	60	80
175 (350)		0	0	0
	CEC	30 meq/100 g		
125 (250)		280	300	300
150-180 (300-360) /3		220	300	300
190 (380)		40	60	80
200 (400)		0	0	0
/1 Values in parentheses are lb/acre.				
/2 Maximum potassium rate recommended is 300 lb K2O per acre.				
/3 Maintenance recommendations are given for this soil test range.				
pH and base fertility should be corrected six (6) months and/or the planting season prior to seeding establishment based on soil test results				

Section 3 - Table 1a: Seeding Rates of Pure Live Seed (PLS) for Conservation Cover, and Field Borders Where Soil Erosion is the Primary Concern[/3]

Species[/1]	Seeds/lb	Pure Stand Seeding Rate[/2]		Proportional Seeding Rates for Mixtures[/1]			
				3/4	1/2	1/3	1/4[/4]
	(x 1000)	(seeds/ft^2)	(lb/A)	lb/A			
Introduced Forbs and Legumes[/1]							
Alfalfa	227	42	8	6	4	2.5	2
Alsike clover	700	48	3	2.25	1.5	1	.75
Austrian Winter Pea	18	17	40	30	20	13	10
Birdsfoot trefoil	375	52	6	4.5	3	2	1.5
Crimson clover	140	48	15	11	7.5	5	4
Korean clover (lespedeza)	240	83	15	11	7.5	5	4
Kura clover	227	31	6	4.5	3	2	1.5
Red clover	275	51	8	6	4	2.5	2
Ladino clover	860	55	3	2.25	1.5	1	.75
Introduced Annual and Perennial Grasses /3							
Garrison creeping foxtail	750	103	6	4	3	2	1.5
Kentucky bluegrass	2200	500	10	7	5	3	2
Orchardgrass	590	130	10	7	5	3	2
Perennial ryegrass	237	130	24	18	12	8	6
Red top	4990	458	4	3	2	1.5	1
Timothy	1230	169	6	4.5	3	2	1.5
Native Grasses							
Big bluestem	150	41	12	9	6	4	3
Little bluestem	255	41	7	5.25	3.5	2.25	1.75
Eastern gamagrass	7.4	3	18	14	9	6	4
Indiangrass	175	40	10	7.5	5	3.5	2.5
Switchgrass	370	42	5	3.75	2.5	1.7	1.25
Canada Wildrye	115	13	5	3.75	2.5	1.7	1.25
Virginia Wildrye	75	9	5	3.75	2.5	1.7	1.25
Sideoats Grama	190	39	9	7	4.5	2.25	1.75
Native Forbs							
Use Table 2 to develop a mix of species appropriate to the site conditions. The mix should provide a seeding rate of at least 2 seeds per square foot. At least one of the species should be a legume**.**							

Footnotes:

/1 Up to (4) legumes / forbs and/or (4) grasses suitable for site conditions may be mixed at pro- rated rates. Be sure to treat legume seed (thereby the soil) with the proper inoculant prior to seeding

/2 Dormant Seeding from Dec 1 to Mar 14 (Cool Season Species) and Nov 1 to March 14 (Warm Season Species) Increase seeding rates by 25% for dormant seedings.

/3 When seeding cool season conservation cover to land where erosion is the primary concern (EI>8, escarpment areas or HEL) be sure to use at least one sod forming grass such as Kentucky Bluegrass or Red Top in the seeding mix.

/4 Do not seed below the ¼ rate.

Section 3 - Table 1b: Seeding Rates of Pure Live Seed (PLS) for Conservation Cover and Field Borders Where Wildlife Habitat is the Primary Concern

Species[/1]	Seeds/lb	Pure Stand Seeding Rate[/2]		Proportional Seeding Rates for Mixtures[/1]			
				3/4	1/2	1/3	1/4[/4]
	(x 1000)	(seeds/ft^2)	(lb/A)	lb/A			
Introduced Legumes[/1]							
Alfalfa	227	31	6	4.5	3	2	1.5
Alsike clover	700	36	2.5	1.5	1	.75	.5
Austrian Winter Pea	18	17	30	22.5	15	10	7.5
Birdsfoot trefoil	375	12	4.5	3.5	2.5	1.5	1
Crimson clover	140	36	11.5	8.5	5.5	4	3
Korean clover (lespedeza)	240	63	11.5	8.5	5.5	4	3
Kura clover	227	39	4.5	3.5	3.5	1.5	1
Red clover	275	23	6	4.5	3	2	1.5
Ladino clover	860	38	2.5	1.5	1	.75	.5
Introduced Grasses							
Garrison creeping foxtail	750	77	4.5	3.5	2	1.5	1
Kentucky bluegrass	2200	379	7.5	5.5	3.5	2.5	1.5
Orchardgrass	590	102	7.5	5.5	3.5	2.5	1.5
Perennial ryegrass	237	98	18	13.5	9	6	4.5
Redtop	4990	344	3	2.5	1.5	1	.75
Timothy	1230	127	4.5	3.5	2	1.5	1
Native Grasses							
Big bluestem	150	21	6	4.5	3	2	.75
Little bluestem	255	20	3.5	2.5	2	1.25	1
Eastern gamagrass	7.4	1.5	9	7	4.5	3	2
Indiangrass	175	20	5	3.75	2.5	1.75	1.25
Switchgrass	370	42	2.5	2	1.25	.75	.5
Canada Wildrye	115	6	2.5	3.75	2.5	1.7	1.25
Virginia Wildrye	75	4	2.5	3.75	2.5	1.7	1.25
Sideoats Grama	190	20	4.5	3.5	2.25	1.5	1
Native Forbs							
Use Table 2 to develop a mix of species appropriate to the site conditions. The mix should provide a seeding rate of at least 2 seeds per square foot. At least one of the species should be a legume.							

Footnotes:

/1 Up to (4) legumes / forbs and/or (4) grasses suitable for site conditions may be mixed at pro- rated rates. Be sure to treat legume seed (thereby the soil) with the proper inoculant prior to seeding

/2 Dormant Seeding from Dec 1 to Mar 14 (Cool Season Species) and Nov 1 to March 14 (Warm Season Species) Increase seeding rates by 25% for dormant seedings.

/4 Do not seed below the ¼ rate.

Section 3 - Table 2: Native Forbs for Conservation Cover and Wildlife

Species	Soil Moisture Tolerance	Bloom Period	Seeds per Square foot @ 1 oz./ac.	# Seeds per oz.
Legumes/1				
Canadian milk vetch (*Astragalus canadensis*)	SPD - WD	Summer	0.32	14,000
Prairie False Indigo (*Baptisia leucantha*)	SPD - WD	Early	0.04	1,700
Partidge Pea (*Cassia fasciculata*)	SPD - ED	Summer - Late	0.08	3,500
Wild Senna (*Cassia hebecarpa*)	PD - MWD	Summer - Late	0.03	1,400
Canada Tick-Trefoil (*Desmodium canadense*)	SPD - WD	Summer	0.11	5,000
Round-headed bush clover (*Lespedeza capitata*)	MWD - ED	Summer - Late	0.22	9,500
Slender bush-clover (*Lespedeza virginica)*	MWD - WD	Summer	0.19	8,500
Non-Legumes				
Nodding Wild Onion (*Allium cernuum*)	MWD - ED	Early	0.17	7,500
Swamp Milkweed (*Asclepias incarnata*)	PD - SPD	Summer	0.10	4,500
Butterfly Weed (*Asclepias tuberosa*)	MWD - ED	Summer	0.08	3,400
Smooth Aster (*Aster laevis*)	MWD- SED	Late	1.10	48,000
New England Aster (*Aster novae-angliae*)	PD - WD	Late	1.61	70,000
Nodding Sticktight (*Bidens cernua*)	PD - SPD	Summer - Late	0.32	14,000
Purple Coneflower (*Echinacea purpurea*)	MWD - ED	Summer	0.12	5,300
Sneezeweed (*Helenium autumnale*)	PD – SPD	Late	0.08	3,500
Sawtooth Sunflower (*Helianthus grosseserratus*)	PD - WD	Summer - Late	0.30	13,000
Western Sunflower (*Helianthus occidentalis*)	WD - ED	Late	0.31	13,500
Smooth Oxeye Sunflower (*Heliopsis helianthoides*)	MWD - ED	Summer	0.15	6,500
Rough Blazing-Star *(Liatris aspera*()	MWD - ED	Late	0.32	14,000
Dense Blazing-Star (*Liatris spicata*)	PD - WD	Summer - Late	0.26	11,500
Wild Begamot (*Monarda fistulosa*)	SPD - WD	Summer	1.77	77,000
Virginia Mountain Mint (*Pycanthemum virginianum*)	SPD - WD	Summer	2.52	110,000
Gray-Headed Coneflower (*Ratibida pinnata*)	MWD - ED	Summer - Late	0.69	30,000
Pasture Rose (*Rosa carolina*)	WD - ED	Summer	0.07	2,900
Black-eyed Susan (*Rudbeckia hirta*)	SPD -ED	Summer	2.27	99,000
Prairie Dock (*Silphium terebinthinaceum*)	SPD - ED	Summer - Late	0.02	1,100
Stiff Goldenrod (*Solidago rigida*)	SPD - ED	Summer - Late	1.03	45,000
Showy Goldenrod (*Solidago speciosa*)	MWD - ED	Late	2.32	101,000
Ohio Spiderwort (*Tradescantia ohioensis*)	SPD - WD	Early	0.18	8,000
Blue Vervain (*Verbena hastata*)	VPD - SPD	Summer	2.50	109,000
Western Ironweed (*Vernonia fasciculata*)	PD - MWD	Summer	0.51	22,000
Golden Alexanders (*Zizia aurea*)	PD - MWD	Early	0.26	11,500
/1 Be sure to treat legume seed (thereby the soil) with the proper inoculant prior to seeding				

Seed Mixes for CP25 – Tallgrass Prairie

Seedings for the CP25 Tallgrass Prairie will follow the current CRP program guidance and NRCS practice standard 643 – Restoration and Management of Rare or Declining Habitat. The intent is to establish a diverse native grass/forb community. Recommended species are found in standard 643 specifications and CRP program guidance. Seeding rates should aim for a rate of 20 grass seeds per square foot and at least 10 forb seeds per square foot. Grass rates found in Table 1b of this section may be used. Overall, the seeding shall contain a minimum of 10 species; a minimum of three grasses is required. All species shall be adapted to site conditions.

Seed Mixes for CP33 – Habitat Buffers for Upland Birds

Seeding recommendations for the CP33 practice shall follow current CRP program guidance and NRCS practice standard 386 – Field Border. The intent is to establish a diverse, low-density stand of vegetation.

Grasses

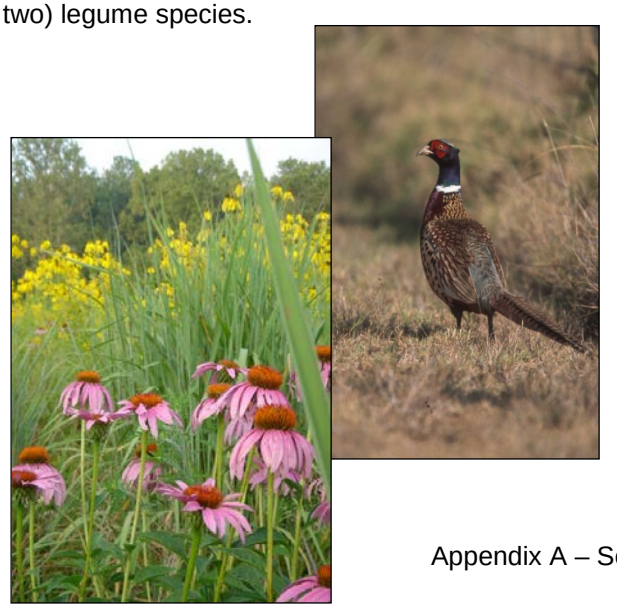
A minimum of 3 grasses from the following list shall be planted. The total of all grasses shall be at least 3 pounds PLS and not more than 5 pounds PLS per acre. Selected species shall be suitable for the soil moisture and other site conditions.

Section 3 Table 3: Warm Season Grasses for CP33 – Habitat Buffers for Upland Birds

Species	Slopes <= 4%	*Slopes > 4%*
	Recommended rates in lb./ac.	*Use seeding rates found in: Section 3 - Table 1b: Seeding Rates of Pure Live Seed (PLS) for Conservation Cover Where Wildlife Habitat is the Primary Concern*
Indiangrass	*0.5 – 1.0*	
Canada Wildrye	*0.5 – 1.5*	
Little Bluestem	*0.5 – 1.75*	
Switchgrass	*0.5 – 1.0*	
Bluejoint grass	*0.1 – 0.25*	
Sideoats Grama	*0.5 - 1.0*	
Big Bluestem	*0.75 – 1.0*	
Virginia Wildrye	*0.5 – 0.75*	

Forbs

A minimum of 7 forbs from Table 2 of this section shall be planted. Depending on species, forb species may total approximately 0.5 to 1.25 pounds per acre. Selected species shall be suitable for the soil moisture and other site conditions. The selection of forbs should include at least one species from each bloom period to provide diversity in the cover. Mixes should include at least one (preferably two) legume species.



Section 3 - Table 4: Seeding Rates of Pure Live Seed (PLS) for Cover Crops

Species /1	Seeds/lb (x 1000)	Pure Stand Seeding Rate /4 (seeds /ft 2)	Pure Stand Seeding Rate /4 (lb/A)	Proportional Seeding Rates for Mixtures /1 /4 3/4 lb/A	1/2 lb/A	1/3 lb/A	1/4 lb/A
Suggested Cover Crops for Recycling Nutrients 1. Cover crops will be established and actively growing before the expected period(s) of nutrient leaching. 2. Cover crop species will be selected for their ability to take up large amounts of nutrients from the rooting profile of the soil.							
Oats	15	20	60	45	30	20	15
Oilseed Radish	140	19	6	4.5	3	2	1.5
Rye, cereal /2	18	18	45	34	23	15	11
Sorghum/Sudan Grass	28	13	20	15	10	7	5
Suggested Cover Crops for Reducing Compaction 1. Select and manage cover crop species that will produce deep roots and large amounts of surface or root biomass to increase soil organic matter, improve soil structure, and increase soil moisture through better infiltration.							
Oilseed Radish	40	5.5	6	4.5	3	2	1.5
Ryegrass, annual /2 /3	228	84	16	12	8	5	4
Suggested Cover Crops for Fixing Nitrogen 1. Only legumes or legume-grass mixtures will be established as cover crops. 2. The specific Rhizobium bacteria for the selected legume will either be present in the soil or the seed will be inoculated.							
Alfalfa (annual)	227	80	15	12	8	5	4
Alsike clover – Ladino clover	700-860	48-55	4	3	2	1.3	1
Austrian Winter Pea /1	18	14	35	26	17	11.5	9
Hairy Vetch /3	20	6	12	9	6	4	3
Red clover	275	51	8	6	4	2.5	2
Soybeans	4	4	45	34	23	15	11
Suggested Cover Crops for Managing Soil Moisture 1. Terminate growth of the cover crop sufficiently early to conserve soil moisture for the subsequent crop. The residue of cover crops established for moisture conservation shall be left on the soil surface. 2. In areas of excess soil moisture, allow the cover crop to grow as long as possible to maximize soil moisture removal.							
Rye, cereal	18	18	45	34	23	15	11
Ryegrass, annual /2 /3	228	84	16	12	8	5	4
Wheat, winter /2 /5	15	28	80	60	40	27	15
Suggest Cover Crops for Additional Forage 1. Species will have desired forage traits, be palatable to livestock, and not interfere with production of the subsequent crop. 2. Forage provided by the cover crop may be hayed or grazed as long as sufficient biomass is left for resource protection.							
Turnip	190	13	3	-	-	-	1
Oats	15	20	60	45	30	20	15
Rye, cereal /2	18	37	90	-	-	-	-
Ryegrass, annual /2 /3	228	126	24	18	12	8	6
Sorghum/Sudan Grass	28	15	20	-	-	-	-
Wheat, winter /2 /5	15	40	80	-	-	-	-

/1 Up to (4) legumes/forbs and/or (4) grasses suitable for site conditions may be mixed at pro-rated rates. Be sure to treat legume seed (thereby the soil) with the proper inoculant prior to seeding.

/2 The use of grass crops before corn takes a higher degree of management due to the potential of creating a "green bridge effect" and subsequent problems with diseases, insects, and allelopathy. The grass cover crop should be killed at least two weeks prior to corn planting.

/3 High level of management.

/4 Increase seeding rates by 20% if aerial seeding or when seeding under poorer growing conditions.

/5 Do not plant until after the Hessian fly free date: Varies from Sept 22 in Northern Ohio to Oct 5 in Southern Ohio. See the Ohio Agronomy Guide for specific date.

Section 3 - Table 5: Establishment (Starter) Fertilizer for Conservation Cover and Wildlife

Bray P1 Soil Test Level	**P2O5 Fert. Required/Ac**
<15 ppm (<30 lbs/ac)	60 lbs/ac
15-30 ppm (30-60 lbs/ac)	40 lbs/ac
> 30 ppm (> 60 lbs/ac)	0
K Soil Test Level	**K2O Fert. Required/Ac**
<110 ppm (<220 lbs/ac)	100 lbs/ac
110-200 ppm (220-400 lb/ac)	40 lbs/ac
>200 ppm (>400 lbs/ac)	0
Nitrogen	**Nitrogen lbs/ac Required**
Pure Cool Season Grasses	30 lbs/ac
Cool Season Grass plus Legume Mix	20 lbs/ac
Warm Season Grass	0
No Soil Test (Option)	**P2O5 and K2O Required**
	40 lbs/ac P2O5
	40 lbs/ac K2O
pH and base fertility should be corrected six (6) months and/or the planting season prior to seeding establishment based on soil test results	

Section 4 - Table 1: Seeding Rates of Pure Live Seed (PLS) for Critical Areas – HUA – Waterways
(Reference ODOT Seeding Specifications)

Mixes	Seeds/lb (x 1000)	Pure Stand Seeding Rate (seeds/ft^2)	Pure Stand Seeding Rate (lb/A)	Percentage of Mix
Critical Areas- Heavy Use Areas – Grassed Waterways/1				
MIX 1: Multipurpose Agland				
Kentucky bluegrass	2200	3282	65	30
Turf type fescue	227	450	87	40
Perennial ryegrass	237	354	65	30
MIX 2: Next to Residential Areas, Low Retardance, Quick Cover				
Kentucky bluegrass	2200	3282	65	30
Creeping red fescue	615	918	65	30
Annual ryegrass	228	225	43	20
Perennial ryegrass	237	234	43	20
MIX 3: Wildlife Secondary Land Use				
Kentucky bluegrass	2200	3282	65	30
Orchardgrass	590	880	65	30
Annual ryegrass	228	120	23	11
Perennial ryegrass	237	234	43	20
Red clover /2	275	126	20	9
MIX 4:				
Kentucky bluegrass	2200	3282	65	30
KY 31 Tall Fescue /I3	227	453	87	40
Perennial ryegrass	237	354	65	30

Seeding Dates for Critical Areas, Heavy Use Areas and Grassed Waterways Only

/1 Standard Seeding Dates Spring: Mar 15 - May 31; Summer: Aug 1 - Sep 15
Dormant Seeding Dates: Dec 1 to Mar 14

Seedings may be considered from **Jun 1 thru Jul 31** if the area is mulched with 95-100% cover (approx. 3 ton/acre of straw); timely watering may be needed during this period to promote establishment. Seedings may also be considered between **Sep 16 and Oct 15** use seeding rates found in this table and mulching rates found in Section 4 Table 5. **Both of these periods however are considered "outside the seeding window" and will need to be evaluated for adequate establishment prior to final approval.**
Seeding between Oct 15 and Dec 1 is not recommended.

/I3 = Invasive without proper management

/2 Be sure to treat legume seed (thereby the soil) with the proper inoculant prior to seeding

Section 4 - Table 2:
Seeding Rates of Pure Live Seed (PLS) for Filter Strips and Vegetative Barriers Grown in Ohio

(Reference NRCS Practice 393 – Filter Strip, 635- Vegetative Treatment Area and 601- Vegetative Barriers)

Suitable for Waste Filters installed under NRCS practice 635 - Vegetative Treatment Area (tolerates wet conditions)								
Species/1	**Seeds/lb**	**Pure Stand Seeding Rate**		**Proportional Seeding Rates for Mixtures/1**				
				3/4	**1/2**	**1/3**	**1/4**	**1/8**
	(x 1000)	**(seeds/ft²)**	**(lb/A)**	**lb/A**				
Perennial Legumes/1								
Alfalfa	227			12	8	5	4	2
Alsike clover	700			7	5	3	2	1
Red clover	275			8	6	4	3	1.5
White clover	860			4	3	2	1	0.5
Perennial Cool Season Grasses and Forbs								
Festulolium /4	227	150	29	22	15	10	7	3.5
Garrison creeping foxtail	775	150	9	7	5	3	2	1
Kentucky bluegrass/4	2200	500	10	8	5	3	2.5	1
Orchardgrass	590	150	11	8	6	4	3	1
Perennial ryegrass/4	237	150	28	21	14	9	7	3.5
Reed canarygrass /I3	550	150	12	9	6	4	3	1.5
Smooth bromegrass	137	150	48	36	24	16	12	6
Tall fescue /I3	227	150	29	22	15	10	7	3.5
Timothy	1230	220	8	6	4	3	2	1
Perennial Warm Season Grasses								
Big bluestem	150	150	44	33	22	15	11	5.5
Little bluestem	255	60	10	7	5	3	2.5	1
Eastern gamagrass	7.4	3	20	15	10	7	5	2.5
Indiangrass	175	150	37	28	18	12	9	4.6
Switchgrass	370	150	18	14	9	6	5	2
Annual Grasses								
/1 Up to (2) legumes and (3) grasses suitable for site conditions may be mixed at pro-rated rates. Be sure to treat legume seed (thereby the soil) with the proper inoculant prior to seeding. Legumes alone are not adequate for filter strips and vegetative barriers.								
Suitable for Waste Filters installed under NRCS practice 635 - Vegetative Treatment Area (tolerates wet conditions)								
/I3 = Invasive without proper management								
/4 = Should only be used in mixes with 3 or more grasses.								

Section 4 - Table 3: Starter Fertilizer for Critical Areas – HUAs – Filter Strips – Grassed Waterways

Lime	Nitrogen /1 /2	Phosphorous (P2O5)/2	Potash (K2O) /2
As needed per site condition	50-100 lbs/Acre 1.25 - 2.5 lbs/1000 s.f.	50-100 lbs/Acre 1.25 – 2.5 lbs/1000 s.f.	50-100 lbs/Acre 1.25 -2.5 lbs/1000 s.f.
/1 For Warm Season Mixes do not apply Nitrogen			
/2 Use lower rates on sites with topsoil or you would expect to be moderate to high in fertility. Use higher rates on highly eroded or low fertility sites away from streams. Incorporate fertilizer prior to seeding as per Section 4 – Table 6 Field Preparation and Planting for Critical Areas and Waterways.			

Section 4 - Table 4: "Temporary Seedings" for Fields or Critical Areas

Seed Mixture	lbs/acre	Spring Seed Period	Summer Seed Period	Fall Seed Period
Oats	128 (4 bu/acre)	3/1 to 6/1	6/1 to 8/1	NA
Annual or Perennial Ryegrass	40	3/1 to 6/1	6/1 to 8/1	8/1 - 11/1
Oats + Sudangrass	64 80	NA	6/1 to 8/1	NA
Cereal Rye	50 - 100 lbs/ac	Begin March 1	All Summer	8/1 to 11/1
/1 Wheat is not recommended as a temporary cover due to the potential Hessian Fly problem when seeded prior to the "fly free" date.				

Section 4 - Table 5: Mulching

See practice code 484 Mulching for more information

Mulch Materials/1	Quality Standards	Application Rates		% Cover	Anchoring Methods	Remarks
		Per 1000 ft2	Per Acre			
Grass hay or cereal grain straw.	Air dried, free of undesirable seeds, coarse material, and moldy chunks. Grass hay should be 2/3's grass species.	100-120 lbs. 3-4 bales	2 - 2.5 T 100-125 bales	80 - 90	• Mulch anchoring tool or disk. • Wood cellulose fiber. • Asphalt spray. • Tackifiers. • Polypropylene plastic netting.	Subject to blowing unless kept moist and anchored. Excellent for grassed waterways and concentrated flow areas to establish seedings.
/1 Within 48 hours after area is seeded						

Garrison creeping foxtail is a cool season grass whose seedheads look much like timothy.

Do not confuse the foxtail in the name with any other weed species of foxtail.

Uses for garrison include wildlife, forage, critical areas and especially waste filters. Consider this grass a better alternative to reed canarygrass when looking for a grass that tolerates wet conditions.

Section 4 - Table 6: Field Preparation and Planting for Critical Areas, Waterways and Vegetative Barriers.

Ground Cover Prior to Planting	Seedbed Preparation and Seeding	Timing	Comments
Row Crop, Small Grain, Existing Sod, Bare Ground, Eroded Areas	1) Till and level ground if needed using: • Plow, Chisel and/or • Light Disk and/or • Field Cultivator (or similar tool)		Work seedbed to a depth of three (3) inches on all areas accessible to equipment. Other areas not accessible to equipment shall be worked by hand tools to a depth of one (1) inch. Where rocks, clods, stumps, and other debris will interfere with the future use of the area they shall be removed to the degree necessary to meet the goals of the planned use.
	2) Apply the necessary lime and fertilizer as recommended in Table 3 above.	After initial tillage. Before seedbed preparation.	
	3. Prepare a firm seedbed with a disk or similar equipment.	Within 48 hours after applying the needed lime and fertilizer	
	4) Culti-pack if possible to firm seedbed	Prior to Seeding	A firm seedbed is important when seeding grasses and legumes.
	5a) Plant using a drill designed for the type of seed being used. **OR** 5b) Broadcast the seed on the surface and culti-pack again.	Use seeding rates and dates in Section 4- Table 1 above.	Calibrate the drill and seed ¼ inch deep.
	6) Mulch the seeded area.	Within 48 hours of seeding.	When mulching with straw, use at least 4,000 pounds of cereal grain straw per acre. The straw shall be evenly distributed and anchored sufficiently to hold it on the site. See practice code 484 Mulching for more info.