



APPENDIX A – SEEDING TABLES

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Section I: General Information for Grasses, Legumes and Forbs Grown in Ohio

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:

$$\% \text{ PLS} = \% \text{ Pure Seed} \times (\% \text{ Germination} + \% \text{ Dormant seed})$$

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:

$$\% \text{ PLS} = \% \text{ Pure Seed [99]} \times (\% \text{ Germination [72]} + \% \text{ Dormant seed [10]})$$

$$\% \text{ PLS} = [.99] \times ([.72] + [.10])$$

$$\% \text{ PLS} = .99 \times .82$$

$$\% \text{ PLS} = .81$$

$$\text{Or Pure Live Seed} = 81 \%$$

$$50 \text{ lbs PLS divided by } .81 = 61.2 \text{ lbs}$$

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:

$$6 \text{ lbs PLS/acre divided by } .81 \text{ (PLS)} = 7.4 \text{ lbs/acre.}$$

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 I: General Information for Grasses, Legumes and Forbs Grown in Ohio

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 ^{/13} | 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 ^{/13} | VPD | High | Medium to high | High | High | Low | Open sod |
| Smooth bromegrass | MWD | Medium | High | High | High | Medium | Open sod |
| Tall fescue ^{/13} | 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 bunched growth; under frequent cutting or grazing, it forms a sod.

^{/13} = Invasive without proper management

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

Section I: General Information for Grasses, Legumes and Forbs Grown in Ohio

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 | Planting Depth (in) | Suitable Uses in Mixes | | | | | | | Northern Ohio ⁴ | Southern Ohio ⁴ | |
|--|------------------------|------------------------|---------------|--------------|--------|-----------|------------------------|-----------|----------------------------|----------------------------|----------------------------|
| | | Conservation Cover | Critical Area | Filter Strip | Forage | Heavy Use | Vegetated Treatment | Water Way | Vegetative Barriers | Seeding Dates ¹ | Seeding Dates ¹ |
| Legumes⁵ | | | | | | | | | | | |
| Alfalfa | ¼ in | X | | | X | | | | | 4/1-5/1 or 8/1-8/15 | 3/20-4/25 or 8/1-8/30 |
| Alsike clover ¹ | ¼ in | X | | | X | | | | | 2/1-5/1 or 7/20-8/30 | 2/1-4/25 or 8/1-9/15 |
| 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 |
| Kura clover | ¼ in | X | | | X | | | | | 4/1-5/1 | 3/20-4/25 |
| Red clover ² | ¼ in | X | | | 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 | 2/1-4/25 or 8/1-9/15 |
| Perennial Cool Season Grasses and Forbs | | | | | | | | | | | |
| Fescue, Creeping Red | 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 |
| Fescue, Tall ³ | 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 | 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 8/1-9/15 |
| 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 | X | | 3/15-5/1 or 8/1-9/15 | 3/1-4/20 or 8/1-9/15 |
| Reed canarygrass ³ | ¼ in | | | | 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 | | | | | | | | | | | |
| 2 = February to early March is the recommended frost seeding period for clovers. | | | | | | | | | | | |
| 3 = Invasive without proper management | | | | | | | | | | | |
| 4 = Northern Ohio is generally North of I70; Southern Ohio is generally South of I70 | | | | | | | | | | | |
| 5 = Be sure to treat legume seed with the proper inoculant prior to seeding | | | | | | | | | | | |

Section I: General Information for Grasses, Legumes and Forbs Grown in Ohio

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 ⁵ | Southern Ohio ⁵ | |
|--|----------------------------------|--------------------|---------------|--------------|--------|-----------|---------------------|-----------|----------------------------|----------------------------|----------------------------|
| | Planting Depth (in) ² | Conservation Cover | Critical Area | Filter Strip | Forage | Heavy Use | Vegetated Treatment | Water Way | Vegetative Barriers | Seeding Dates ¹ | Seeding Dates ¹ |
| Perennial Warm Season Grasses, Legumes⁶ and Forbs | | | | | | | | | | | |
| Big bluestem | ¼ in | X | | X | X | | | | X | 4/1-6/1 | 4/1-6/1 |
| Caucasian bluestem ³ | 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 ^{3&5} | 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 | | 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 | | | | | 4/1-5/1 or 7/20-8/30 | 3/15-4/20 or 8/1-9/15 |
| Hairy Vetch | ¼ in | | | | 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 | 1 in | | | | X | | | | | 3/1-4/15 or 8/1-9/5 | 3/1-4/15 or 8/1-9/15 |
| Rye, cereal ⁴ | 1 in | | | | 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 | | | | | 5/15-7/5 | 5/1-7/15 |
| Soybeans | 1½ in | | | | X | | | | | 5/1-8/1 | 5/1-8/1 |
| Triticale | 1 in | | | | X | | | | | 3/1-4/15 or 8/1-10/15 | 3/1-4/15 or 8/1-10/15 |
| Wheat, winter ⁷ | 1 in | | | | X | | | | | 9/22-10/22 | 9/30-11/1 |
| 1 = Dormant Seeding from Dec 1 to Mar 14 (cool season species) and Nov 1 to Mar 14 (warm season species) | | | | | | | | | | | |
| 2 = Planting depth is critical for successful establishment. Many failures result from planting too deeply. | | | | | | | | | | | |
| 3 = Invasive without proper management | | | | | | | | | | | |
| 4 = Annual ryegrass if allowed to go to seed can be very competitive with wheat and provide limited control options | | | | | | | | | | | |
| 5 = Northern Ohio is generally North of I70; Southern Ohio is generally South of I70 | | | | | | | | | | | |
| 6 = Be sure to treat legume seed with the proper inoculant prior to seeding | | | | | | | | | | | |
| 7 = 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 I: General Information for Grasses, Legumes and Forbs Grown in Ohio

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: <ul style="list-style-type: none"> • Light Disk and/or • Field Cultivator (or similar tool) | Between April 1 st and June 1 st . | 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 | | |
| | 4) Culti-pack again for seed to soil contact. | | See Section 1 Table 5: Broadcasting Methods below |
| | 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: <ul style="list-style-type: none"> • Disk and/or • Field Cultivator (or similar tool) | Between April 1 st and June 1 st . | |
| | 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 1 st and June 1 st . | Soil should be firm enough that your footprint is no deeper than ½ inch. |
| | 3) Level ground using: <ul style="list-style-type: none"> • 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 I: General Information for Grasses, Legumes and Forbs Grown in Ohio

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 |
|---|---|---|
| <p>Commercial Fertilizer Truck or Fertilizer Spreader</p> | <p>Have fertilizer dealer mix WSG seed with carrier:</p> <ul style="list-style-type: none"> • Lime at a rate of 500 lbs / acre <p style="text-align: center;">Or</p> <ul style="list-style-type: none"> • Phosphorus or Potash Fertilizer at a rate of 200 lbs / acre. <p style="text-align: center;">DO NOT USE NITROGEN FERTILIZER!</p> <p>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.</p> | <p>Can be used to seed large acreage.</p> <p>The WSG will not broadcast as far as the carriers. You must overlap to ensure even coverage.</p> <p>Nitrogen fertilizer will stimulate cool season grasses and weeds.</p> <p>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.</p> |
| <p>Spinner Type Seeder with Agitator</p> | <p>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)</p> <p style="text-align: center;">Or</p> <p>Have seed dealer mix the WSG with carrier:</p> <ul style="list-style-type: none"> • Cracked wheat or oats at a rate of 1 bu/acre <p style="text-align: center;">Or</p> <ul style="list-style-type: none"> • 50 lbs of pelletized lime per acre | <p>Can be used to seed medium to large acreage.</p> <p>Calibrate seeder by adding one acre of seed to the seeder and plant a 206' x 206' area. Adjust seed flow settings accordingly.</p> <p>Cracked wheat will not germinate</p> <p>One tip is to cut the seeding rate in half and go over the seeding area twice in opposite directions.</p> |
| <p>Conventional Cyclone Seeder or WSG Hand Broadcaster</p> | <p>Use debarbed seed with a conventional Cyclone type seeder.</p> <p style="text-align: center;">Or</p> <p>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.</p> | <p>Limited to small to medium size acreage</p> <p>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.</p> |
| <p>Broadcast by Hand</p> | <p>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%.</p> | <p>Limited to very small areas</p> <p>You must overlap to ensure even coverage.</p> |

Section I: General Information for Grasses, Legumes and Forbs Grown in Ohio

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 broadleaves 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 I: General Information for Grasses, Legumes and Forbs Grown in Ohio

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: <ul style="list-style-type: none"> • 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: Forage and Biomass Planting

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 (x 1000) | Pure Stand Seeding Rate ^{2A,2B} (seeds/ft ²) (lb/A) | | Proportional Seeding Rates for Mixtures ^{/1} | | | | |
|------------------------------------|----------------------|---|-----|---|-----|-----|-----|-----|
| | | | | 3/4 | 1/2 | 1/3 | 1/4 | 1/8 |
| | | | | lb/A | | | | |
| Perennial Legumes | | | | | | | | |
| 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 /13 / 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 /13 /5 | 550 | 130 | 10 | 7 | 5 | 3 | 2 | 1 |
| Smooth bromegrass | 137 | 50 | 16 | 12 | 8 | 5 | 4 | 2 |
| Tall fescue /3 /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 /13 | 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 | 3/5 | 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)

^{/13} = 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: Forage and Biomass Planting

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



Section 2: Forage and Biomass Planting

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 ^{/13/5} | 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 ^{/13/6} | NR | HS | HS | Spring, summer, fall | Medium-late |
| Smooth brome grass | NR | S | HS | Spring, summer, fall | Medium-late |
| Tall fescue ^{/13/6} | 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 ^{/13} | 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. | | | | | |
| /13 = 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: Forage and Biomass Planting

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 leume | 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

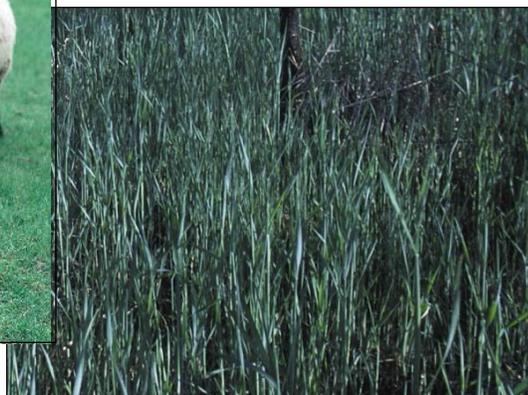
Includes Maintenance Plus Four-Year Buildup to the Critical Level Where Needed

(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 ₂ O 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: Forage and Biomass Planting

**Section 2 - Table 6: Annual Phosphate (P₂O₅) 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 (t/ n/acre) | | |
|---------------------------------|---|-----|-----|
| | 4 | 6 | 8 |
| | lb P ₂ O 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) | CEC | Yield Potential (ton/acre) | | |
|---------------------------------|------------|------------------------------|------------------|-----|
| | | 4 | 6 | 8 |
| | | lb K ₂ O 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: Conservation Cover - Field Borders - Wildlife

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

| Species ¹ | Seeds/lb (x 1000) | Pure Stand Seeding Rate ² | | Proportional Seeding Rates for Mixtures ¹ | | | |
|---|----------------------|--------------------------------------|--------|--|-----|------|------------------|
| | | (seeds/ft ²) | (lb/A) | 3/4 | 1/2 | 1/3 | 1/4 ⁴ |
| | | | | lb/A | | | |
| Introduced Forbs and Legumes¹ | | | | | | | |
| 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 creening 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 | | | | | | | |
| 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: Conservation Cover - Field Borders - Wildlife

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 (x 1000) | Pure Stand Seeding Rate ² | | Proportional Seeding Rates for Mixture ^{/1} | | | |
|--|--------------------------|--------------------------------------|--------|--|------|------|-------------------|
| | | (seeds/ft ²) | (lb/A) | 3/4 | 1/2 | 1/3 | 1/4 ^{/4} |
| 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: Conservation Cover –Field Borders - Wildlife

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. |
|--|-------------------------|---------------|-----------------------------------|-----------------|
| Legumes¹ | | | | |
| Canadian milk vetch (<i>Astragalus canadensis</i>) | SPD - WD | Summer | 0.32 | 14,000 |
| Prairie False Indigo (<i>Baptisia leucantha</i>) | SPD - WD | Early | 0.04 | 1,700 |
| Partidge Pea (<i>Cassia fasciculata</i>) | SPD - ED | Summer - Late | 0.08 | 3,500 |
| Wild Senna (<i>Cassia hebecarpa</i>) | PD - MWD | Summer - Late | 0.03 | 1,400 |
| Canada Tick-Trefoil (<i>Desmodium canadense</i>) | SPD - WD | Summer | 0.11 | 5,000 |
| Round-headed bush clover (<i>Lespedeza capitata</i>) | MWD - ED | Summer - Late | 0.22 | 9,500 |
| Slender bush-clover (<i>Lespedeza virginica</i>) | MWD - WD | Summer | 0.19 | 8,500 |
| Non-Legumes | | | | |
| Nodding Wild Onion (<i>Allium cernuum</i>) | MWD - ED | Early | 0.17 | 7,500 |
| Swamp Milkweed (<i>Asclepias incarnata</i>) | PD - SPD | Summer | 0.10 | 4,500 |
| Butterfly Weed (<i>Asclepias tuberosa</i>) | MWD - ED | Summer | 0.08 | 3,400 |
| Smooth Aster (<i>Aster laevis</i>) | MWD- SED | Late | 1.10 | 48,000 |
| New England Aster (<i>Aster novae-angliae</i>) | PD - WD | Late | 1.61 | 70,000 |
| Nodding Sticktight (<i>Bidens cernua</i>) | PD - SPD | Summer - Late | 0.32 | 14,000 |
| Purple Coneflower (<i>Echinacea purpurea</i>) | MWD - ED | Summer | 0.12 | 5,300 |
| Sneezeweed (<i>Helenium autumnale</i>) | PD – SPD | Late | 0.08 | 3,500 |
| Sawtooth Sunflower (<i>Helianthus grosseserratus</i>) | PD - WD | Summer - Late | 0.30 | 13,000 |
| Western Sunflower (<i>Helianthus occidentalis</i>) | WD - ED | Late | 0.31 | 13,500 |
| Smooth Oxeye Sunflower (<i>Heliopsis helianthoides</i>) | MWD - ED | Summer | 0.15 | 6,500 |
| Rough Blazing-Star (<i>Liatris aspera</i>) | MWD - ED | Late | 0.32 | 14,000 |
| Dense Blazing-Star (<i>Liatris spicata</i>) | PD - WD | Summer - Late | 0.26 | 11,500 |
| Wild Begamot (<i>Monarda fistulosa</i>) | SPD - WD | Summer | 1.77 | 77,000 |
| Virginia Mountain Mint (<i>Pycnanthemum virginianum</i>) | SPD - WD | Summer | 2.52 | 110,000 |
| Gray-Headed Coneflower (<i>Ratibida pinnata</i>) | MWD - ED | Summer - Late | 0.69 | 30,000 |
| Pasture Rose (<i>Rosa carolina</i>) | WD - ED | Summer | 0.07 | 2,900 |
| Black-eyed Susan (<i>Rudbeckia hirta</i>) | SPD-ED | Summer | 2.27 | 99,000 |
| Prairie Dock (<i>Silphium terebinthinaceum</i>) | SPD - ED | Summer - Late | 0.02 | 1,100 |
| Stiff Goldenrod (<i>Solidago rigida</i>) | SPD - ED | Summer - Late | 1.03 | 45,000 |
| Showy Goldenrod (<i>Solidago speciosa</i>) | MWD - ED | Late | 2.32 | 101,000 |
| Ohio Spiderwort (<i>Tradescantia ohioensis</i>) | SPD - WD | Early | 0.18 | 8,000 |
| Blue Vervain (<i>Verbena hastata</i>) | VPD - SPD | Summer | 2.50 | 109,000 |
| Western Ironweed (<i>Vernonia fasciculata</i>) | PD - MWD | Summer | 0.51 | 22,000 |
| Golden Alexanders (<i>Zizia aurea</i>) | PD - MWD | Early | 0.26 | 11,500 |

Section 3: Conservation Cover –Field Borders - Wildlife

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% |
|------------------|---|---|
| | <i>Recommended rates in lb./ac.</i> | |
| Indiangrass | 0.5 – 1.0 | <i>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</i> |
| 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: Conservation Cover - Field Borders - Wildlife

Section 3 - Table 4: 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 |
| <hr/> | |
| 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 |
| <hr/> | |
| 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 |
| <hr/> | |
| No Soil Test (Option) | P2O5 and K2O Required |
| | 40 lbs/ac P2O5 |
| | 40 lbs/ac K2O |
| <hr/> | |
| 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: Critical Areas – Heavy Use Areas – Filter Strips – Waterways –
Vegetative Barriers

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

| Mixes | Seeds/lb | Seeding Mix Rate | | Percentage of Mix |
|--|----------|--------------------------|--------|-------------------|
| | (x 1000) | (seeds/ft ²) | (lb/A) | |
| Critical Areas- Heavy Use Areas – Grassed Waterways^{/1} | | | | |
| MIX 1: Multipurpose Agland | | | | |
| Turf type fescue | 230 | 211 | 40 | 47 |
| Kentucky bluegrass | 1400 | 643 | 20 | 23 |
| Perennial ryegrass | 237 | 136 | 25 | 30 |
| MIX 2: Next to Residential Areas, Low Retardance, Quick Cover | | | | |
| Kentucky bluegrass | 2200 | 482 | 15 | 41 |
| Creeping red fescue | 615 | 165 | 16.5 | 27 |
| Annual ryegrass | 228 | 8 | 1.5 | 1 |
| Perennial ryegrass | 237 | 103 | 19 | 30 |
| MIX 3: Wildlife Secondary Land Use | | | | |
| Kentucky bluegrass | 1400 | 354 | 11 | 18 |
| Orchardgrass | 590 | 304 | 22.5 | 37 |
| Annual ryegrass | 228 | 31 | 1.5 | 10 |
| Perennial ryegrass | 237 | 103 | 19 | 31 |
| Red clover ^{/2} | 275 | 13 | 2 | 3 |
| MIX 4: | | | | |
| KY 31 Tall Fescue ^{/13} | 227 | 188 | 40 | 47 |
| Kentucky bluegrass | 1400 | 643 | 20 | 23 |
| Perennial ryegrass | 237 | 136 | 25 | 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. | | | | |
| /13 = Invasive without proper management | | | | |
| /2 Be sure to treat legume seed (thereby the soil) with the proper inoculant prior to seeding | | | | |

Section 4: Critical Areas – Heavy Use Areas – Filter Strips – Waterways –
Vegetative Barriers

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 (x 1000) | Pure Stand Seeding Rate | | | | | | S |
| | | (seeds/ft ²) | (lb/A) | 3/4 | 1/2 | 1/3 | 1/4 | 1 8 |
| | | | | 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. |
| 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. |
| Reed canarygrass ^{/13} | 550 | 150 | 12 | 9 | 6 | 4 | 3 | 1. |
| Smooth brome grass | 137 | 150 | 48 | 36 | 24 | 16 | 12 | 6 |
| Tall fescue ^{/13} | 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 |
| Indian grass | 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) | | | | | | | | |
| /13 = Invasive without proper management | | | | | | | | |
| /4 = Should only be used in mixes with 3 or more grasses. | | | | | | | | |

**Section 4: Critical Areas – Heavy Use Areas – Filter Strips – Waterways -
Vegetative Barriers**

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 ft ² | 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 | <ul style="list-style-type: none"> 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: Critical Areas – Heavy Use Areas – Filter Strips – Waterways –
Vegetative Barriers

**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: <ul style="list-style-type: none"> • 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. |

