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Natural Resources Conservation Service

Seeding Tables

Table 1. Agronomic Adaptation and Characteristics of Perennial Forages - Ohio

(Source OSU Bulletin 472 - Ohio Agronomy Guide 13th Edition)

Forage Species	Minimum Adequate Drainage ₁	Tolerance to pH < 6.0	Minimum Adequate Fertility	Drought Tolerance	Persistence	Seedling Aggressiveness	Growth Habit
LEGUMES							
Alfalfa	WD	Low	High to Med	High	High	High	Bunch
Red Clover	SPD	Medium	Medium	Medium	Low	High	Bunch
Birdsfoot Trefoil	SPD	High	Medium	Medium	Medium	Low	Bunch
White Clover, Dutch	PD	Medium	Medium	Low	High	Low	Spreading
White Clover, Ladino	PD	Medium	High to Med	Low	High	Low	Spreading
Lespedeza	MWD	High	High	High	Medium	Medium	Spreading
Sweetclover	MWD	High	Medium	High	Medium	High	Bunch
Alsike Clover	PD	High	Medium	Low	Low	Low	Spreading
COOL SEASON GRASSES							
Kentucky Bluegrass	SPD	Medium	Medium	Low	High	Low	Dense Sod
Orchardgrass	SPD	Medium	Medium	Medium	Medium	High	Bunch
Perennial Ryegrass	SPD	Medium	Med to High	Low	Low	Very High	Bunch
Reed Canarygrass	VPD	High	Med to High	High	High	Low	Open Sod
Smooth Brome	MWD	Medium	High	High	High	Medium	Open Sod
Tall Fescue	SPD	High	Medium	Medium	High	High	Variable ₂
Timothy	MWD	Medium	Medium	Low	High	Low	Bunch
Garrison Grass	VPD	Medium	Medium	High	High	Low	Open Sod
Canada Wildrye	MWD	Medium	Low	Medium	High	Medium	Bunch
Virginia Wildrye	SPD	Medium	Medium	Medium	High	Medium	Bunch
WARM SEASON GRASSES							
Switchgrass	SPD	High	Low to Med	Excellent	High	Very Low	Bunch
Big Bluestem	MWD	High	Low to Med	Excellent	High	Very Low	Bunch
Indiangrass	MWD	High	Low to Med	Excellent	High	Very Low	Bunch
Caucasian Bluestem	SPD - MWD	High	Low to Med	Excellent	High	Low-Med	Bunch
Little Bluestem	MWD	High	Low to Med	Excellent	High	Medium	Bunch
Sideoats Grama	MWD	High	Low to Med	Excellent	High	Medium	Spreading
Eastern Gamagrass	PD	High	Low 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 a bunchy growth; under frequent cutting or grazing it forms a sod.

Table 2. Suitability of Perennial Forages to Different Management and Growth Characteristics

(Source OSU Bulletin 472 - Ohio Agronomy Guide 13th Edition)

Forage Species	Frequent, Close Grazing ¹	Rotational Grazing ₁	Stored Feed ₁	Periods of Primary Production	Relative Maturity ₂
LEGUMES					
Alfalfa	NR	S	H	Spring, Summer, Early Fall	Early - Medium
Red Clover	NR	S	H	Spring, Summer, Early Fall	Medium - Late
Birdsfoot Trefoil	NR	H	H	Spring, Summer, Early Fall	Medium - Late
White Clover, Dutch	H	H	NR	Spring and Fall	Early - Medium
White Clover, Ladino	NR	H	S	Spring, Early Summer, Fall	Early - Medium
Lespedeza	NR	H	S	Late Summer	Late
Sweetclover	NR	NR	NR	NA (Conservation Cover)	NA
Alsike Clover	NR	S	S	Spring, Early Summer, Fall	Late
COOL SEASON GRASSES					
Kentucky Bluegrass	H	H	NR	Early Spring, Late Fall	Early
Orchardgrass	NR ₃	H	H	Early Spring, Summer, Fall	Early - Medium
Perennial Ryegrass	NR ₃	H	H	Early Spring and Late Fall	Early - Medium
Reed Canarygrass	NR	H	H	Early Spring, Summer, Fall	Medium - Late
Smooth Brome	NR	S	H	Spring, Summer, Fall	Medium - Late
Tall Fescue	NR	H	H	Early Spring, Summer, Fall	Medium - Late
Timothy	NR	S	H	Late Spring and Fall	Late
Garrison Grass	NR	S	NR ₄	Spring, Early Summer	Medium - Late
WARM SEASON GRASSES					
Switchgrass	NR	H	H	Summer	Very Late
Big Bluestem	NR	H	H	Summer	Very Late
Indiangrass	NR	H	H	Summer	Very Late
Caucasian Bluestem	NR	H	H	Summer	Late
Eastern Gamagrass	NR	H	S	Summer	Very Late

1/ H = Highly Suitable; S = Suitable; NR = Not Recommended

2/ 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.

3/ Can tolerate frequent grazing if 3 - 4 inch stubble is maintained.

4/ Although Garrison Grass' suitability as stored feed is not rated it does grow and appear very similar to Timothy.

Section IV, FOTG
Appendix A - Seeding Tables

Table 3. Forage, Wildlife, and Filter Strip Seeding Rates and Dates to Seed

(Source OSU Bulletin 472 - Ohio Agronomy Guide 13th Edition, and NRCS Sources)

Species / Mix ^{3,4}	Rate Lbs / Acre ^{5,6}	Suitable Uses ¹	Northern Ohio ² Seeding Dates	Southern Ohio ² Seeding Dates
Alfalfa	12-15	F, CC	4/1 - 5/1 or 8/1 - 8/15	3/15 - 4/15 or 8/1 - 8/30
Alfalfa plus Timothy, or Orchardgrass, or Smooth Brome, or Garrison Grass, or Per. Ryegrass, or Tall Fescue	10 2-4 2-5 5-7 4 3-5 8-10	F, CC, W, FS " " " " F, CC, FS	4/1 - 5/1 or 8/1 - 8/15	3/15 - 4/15 or 8/1 - 8/30 Not Recommended ⁸
Red Clover	10	F, CC	4/1 - 5/1 or 7/20 - 8/10	3/15 - 4/20 or 8/1 - 8/20
Red Clover plus Timothy, or Orchardgrass, or Smoothbrome, or Garrison, or Per. Ryegrass, or Tall Fescue	8 2-4 2-5 5-7 4 3-5 8-10	F, CC, W, FS " " " " F, CC, FS	4/1 - 5/1 or 7/20 - 8/10	3/15 - 4/20 or 8/1 - 8/20 Not Recommended ⁸
Birdsfoot Trefoil	8	F, CC	4/1 - 5/1	3/15 - 4/20
Birdsfoot Trefoil + Timothy, or Orchardgrass, or Smooth Brome, or Garrison Grass, or Per. Ryegrass, or Tall Fescue	6 2-4 2-5 5-7 4 3-5 8-10	F, CC, W, FS " " " " F, CC, FS	4/1 - 5/1	3/15 - 4/20 Not Recommended ⁸
Alsike Clover plus Timothy, or Orchardgrass, or Smooth Brome, or Garrison Grass, or Per. Ryegrass, or Tall Fescue	3-4 2-4 2-5 5-7 4 3-5 8-10	F, CC, W, FS " " " " F, CC, FS	4/1 - 5/1 or 7/20 - 8/10	3/15 - 4/20 or 8/1 - 8/20 Not Recommended ⁸
Sweetclover	8-12	CC, W	4/1 - 5/1 or 8/1 - 8/15	3/15 - 4/15 or 8/1 - 8/30
Sweetclover + Timothy, or Orchardgrass, or Smooth Brome, or Garrison Grass, or Per. Ryegrass, or Tall Fescue	8 2-4 2-5 5-7 4 3-5 8-10	CC, W	4/1 - 5/1 or 8/1 - 8/15	3/15 - 4/15 or 8/1 - 8/30 Not Recommended ⁸

1/ F = Forage Purposes; CC = General Conservation Cover; W = Wildlife Purposes; FS = Filter Strip Purposes; WF = Waste Filter Purposes

2/ Northern Ohio = Generally North of I-70; Southern Ohio = Generally South of I-70.

3/ Ladino Clover may be added to any mix @ 0.5 lbs/ac for all uses.

4/ Up two (2) Legumes and three (3) grasses may be mixed at pro rated rates for all purposes that are suitable for the site conditions. Use the most restrictive planting dates. Inoculate Legumes.

5/ PLS = Pure Live Seed

6/ Seeding rates may be increased by 50% for filter strips, infiltration areas, or poor soil conditions.

7/ Oats @ 1 bu/acre; or not more than 1 lb/ac of Timothy and/or 2-3 lbs/ac of Red Clover, Alsike Clover, Alfalfa, or 5 lbs/ac of Annual Lespedeza may be added at seeding time as a companion crop to provide early cover where erosion is a concern; or seed with a reduced stand corn crop (15,000 - 18,000 pop.). For wildlife purposes 0.25 lbs/ac of forbes may be added to the mix.

8/ Warmer summers weaken the stand and make the stand susceptible to winter kill.

Table 3. Forage, Wildlife, and Filter Strip Seeding Rates and Dates to Seed (Con't)

(Source OSU Bulletin 472 - Ohio Agronomy Guide 13th Edition)

Species / Mix ^{3,4}	Rate Lbs / Acre ^{5,6}	Suitable Uses ¹	Northern Ohio ² Seeding Dates	Southern Ohio ² Seeding Dates
Annual Lespedeza	25-35	F, CC, W	Not Recommended	2/15 - 4/15
Annual Lespedeza + Timothy, or Orchardgrass, or Smooth Brome, or Garrison Grass, or Per. Ryegrass, or Tall Fescue	15 2-4 2-5 5-7 4 3-5 8-10	F, CC, W, FS " " " " F, CC, FS	Not Recommended	3/15 - 4/15 Not Recommended ⁸
Orchardgrass	8-10	F, CC, FS, W	4/1 - 5/1 or 8/1 - 8/20	3/1 - 4/15 or 8/1 - 8/30
Reed Canarygrass	10-12	F, CC, FS, WF, W	4/1 - 5/1 or 8/1 - 8/15	3/15 - 4/15 or 8/1 - 8/25
Smooth Brome	10-15	F, CC, FS, W	4/1 - 5/1 or 8/1 - 8/20	3/15 - 4/15 or 8/1 - 8/30
Tall Fescue	10-15	F, CC, FS, WF	4/1 - 5/1 or 8/1 - 8/20	3/15 - 4/15 or 8/1 - 8/30
Garrison Grass	4-5	F, CC, FS, WF, W	4/1 - 5/1 or 8/1 - 8/30	3/15 - 4/15 or 8/1 9/15
Canada Wildrye	1-3	F, CC, W, FS	4/1 - 5/1 or 8/1 - 8/30	3/15 - 4/15 or 8/1 9/15
Virginia Wildrye	1-3	F, CC, W, FS	4/1 - 5/1 or 8/1 - 8/30	3/15 - 4/15 or 8/1 9/15
Switchgrass ⁷	8-10 PLS	F, W, FS, WF, CC	4/15 - 5/15	4/15 - 5/15
Indiangrass ⁷	10-12 PLS	F, W, FS, CC	4/15 - 5/15	4/15 - 5/15
Big Bluestem ⁷	10-12 PLS	F, W, FS, CC	4/15 - 5/15	4/15 - 5/15
Eastern Gamagrass ⁷	8-10 PLS	F, W, FS, CC	4/15 - 5/15	4/15 - 5/15
Little Bluestem		F, W, FS, CC	4/15 - 5/15	4/15 - 5/15
Sideoats Grama	5-10	F, W, FS, CC	4/15 - 5/15	4/15 - 5/15
Caucasian Bluestem ⁷	2-4 PLS	F, W, FS, CC	4/15 - 5/15	4/15 - 5/15
Warm Season Wildlife Mix.... ⁷ Any Combination of Switchgrass, Big Bluestem, Little Bluestem, Indiangrass, Caucasian Bluestem, Sideoats Grama	6-8 PLS	W, FS	4/15 - 5/15	4/15 - 5/15
Annuals				
Sudangrass	25	F, CC	5/15 - 7/1	5/1 - 7/15
Sorghum-Sudangrass	20-25	F, CC	5/15 - 7/1	5/1 - 7/15
Forage Sorghum	8-12	F, CC	5/15 - 7/1	5/1 - 7/15
Pearl Millet	15-20	F, CC	5/15 - 7/1	5/1 - 7/15
Brassicas				
Rape or Kale	3.5 - 4.0	F	4/15 - 6/1	4/15 - 6/1
Turnip or Swede	1.5 - 2.0	F	7/1 - 8/30	7/1 - 8/30

1/ F = Forage Purposes; CC = General Conservation Cover; W = Wildlife Purposes; FS = Filter Strip Purposes; WF = Waste Filter Purposes

2/ Northern Ohio = Generally North of I-70; Southern Ohio = Generally South of I-70.

3/ Ladino Clover may be added to any mix @ 0.5 lbs/ac for all uses.

4/ Up two (2) Legumes and three (3) grasses may be mixed at pro rated rates for all purposes that are suitable for the site conditions. Use the most restrictive planting dates. Inoculate Legumes.

5/ PLS = Pure Live Seed

6/ Seeding rates may be increased by 50% for filter strips, infiltration areas, or poor soil conditions.

7/ Oats @ 1 bu/acre; or not more than 1lb/ac of Timothy and/or 2-3 lbs/ac of Red Clover, Alsike Clover, Alfalfa, or 5 lbs/ac of Annual Lespedeza may be added at seeding time as a companion crop to provide early cover ; or seed with a reduced stand corn crop (15,000 - 18,000 pop.). For wildlife purposes 0.25 lbs/ac of forbes may be added to the mix.

8/ Warmer summers weaken the stand and make the stand susceptible to winter kill.

Table 4. Establishment (Starter) Fertilizer for Forage , Filter Strips, and Conservation Cover¹

Bray P1 Soil Test Level¹⁾	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

1/ pH and base fertility should be corrected six (6) months and/or the planting season prior to seeding establishment based on soil test results.

Table 5. Fertility for Critical Area Type Seedings.

Lime	Nitrogen ¹	Phosphorous (P2O5)	Potash (K2O)
As needed per site condition	50- 60 Lbs/Acre 1.25 Lbs/1000 ft sq.	50- 60 Lbs/Acre 1.25 Lbs/1000 ft sq.	50- 60 Lbs/Acre 1.25 Lbs/1000 ft sq.

1/ For Warm Season Mixes do not apply Nitrogen.

Table 6. Permanent Critical Area Seedings

(Waterway-Type Areas, Critical Area, Reclamation Seeding Areas)

Seeding Mixture ^{1,3,4,9}	lbs/acre ²	Suitable Purposes	Suitable Site Drainage ⁵	Desirable pH Range
Creeping Red Fescue + ₆ Ryegrasses + Kentucky Bluegrass	20 - 40 10 - 20 20 - 40	WW, CA	WD	4.5 - 7.5
Tall Fescue	40 - 50	WW, CA, HU, R	All	5.0 - 8.0
Tall Fescue + Annual or Perennial Ryegrass	40 - 50 5 - 10	WW, CA, HU, R	All	5.0 - 8.0
Creeping Red Fescue + ₆ Tall Fescue	20 - 25 20 - 25	WW, CA, HU	WD	4.5 - 7.5
Tall Fescue + Reed Canarygrass ₇	15 - 20 8 - 10	CA, HU, R	All	5.0 - 8.0
Smooth Brome Timothy Redtop	15-25 5-10 1-2	WW	MWD, WD	5.5 - 7.5
Garrison Grass ₇	12 - 15	WW, CA, HU, R	All	5.0 - 8.0
Tall Fescue + Red Clover, or Sweetclover, or Birdsfoot Trefoil,	15 - 30 8 - 10 6 - 8 6 - 12	CA, R	MWD MWD All	5.5 - 7.5 6.0 - 7.5 5.0 - 7.0
Tall Fescue + Crownvetch, or Flatpea	20 - 30 10 - 20 20 - 25	CA, R	MWD All	5.5 - 7.5 4.5 - 8.0
Tall Fescue + Timothy + Sweetclover	25 - 35 3 - 6 6 - 8	CA, R	MWD	6.0 - 7.5
Tall Fescue + Deertongue + Sweetclover	15 - 25 15 - 20 6 - 8	CA, R	MWD	6.0 - 7.5
Turf-Type Tall Fescue + Kentucky Bluegrass	90 - 100 5 - 10	WW, CA, HU, R	All	5.0 - 8.0
Orchardgrass + Red Clover, or Sweetclover, or Birdsfoot Trefoil, or Alsike Clover	8 - 20 8 - 10 6 - 8 6 - 12 3 - 6	CA, R	MWD MWD All All	5.5 - 7.5 6.0 - 7.5 5.0 - 7.5 5.0 - 7.5

1/ One (1) bushel/acre of rye or wheat or oats; or 10 lbs/acre of annual or perennial rye may be added to the mix for quicker green-up or stabilization.

2/ WW=Waterway Type Areas; CA=Critical Areas; HU=Heavy Use Areas; R=Reclamation

3/ Standard Seeding Dates (Spring March 15 - May 31; Summer August 1 - September 15; Dormant December 1 - March 14). Seedings may be considered from June 1 thru July 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 provide establishment. Seedings may also be considered between September 16 and November 30 (except for waterway type areas); apply the standard seeding rate during this time and apply an additional 50% of the seeding rate during the dormant period.

4/ Use the higher seeding rates for steeper slopes, reclamation areas, or poorer site conditions.

5/ Drainage: WD=Well Drained; MW=Moderately Well Drained; SPD=Somewhat Poorly Drained; PD=Poorly Drained.

6/ For close mowing and for waterways with < 2.0 ft/sec velocity.

7/ Will tolerate flooding better than other mixtures.

8/ Seed only from 4/15 to 5/15.

9/ This list is not all inclusive, other species and mixtures may be used based on the site suitability and landuser goals. Consult a NRCS state or area specialist to plan other species and mixtures.

Table 6. Permanent Critical Area Seedings (Continued)
(Waterway-Type Areas, Critical Area, Reclamation Seeding Areas)

Seeding Mixture ^{1,3,4}	lbs/acre ²	Suitable Purposes	Suitable Site Drainage ⁵	Desirable pH Range
Orchardgrass + Timothy + Red Clover, or Sweetclover, or Birdsfoot Trefoil, or Alsike Clover	5 - 10 5 - 10 8 - 10 6 - 8 6 - 12 3 - 6	CA, R	MWD MWD All All	5.5 - 7.5 6.0 - 7.5 5.0 - 7.5 5.0 - 7.5
Smooth Bromegrass + Timothy + Red Clover, or Sweetclover, or Birdsfoot Trefoil, or Alsike Clover	5 - 10 5 - 10 8 - 10 6 - 8 6 - 12 3 - 6	CA, R	MWD MWD All All	5.5 - 7.5 6.0 - 7.5 5.0 - 7.5 5.0 - 7.5
Switchgrass + ⁸ Big Bluestem + Birdsfoot Trefoil	5 - 10 PLS 5 - 10 PLS 2 - 5	CA, R	MWD	5.0 - 7.5
Caucasian Bluestem + ⁸	4 - 6 PLS	CA, R	MWD	5.0 - 7.5
Birdsfoot Trefoil + Creeping Red Fescue	6- 12 20 - 40	CA	All	5.0 - 7.5
Bluegrass + Ryegrass	100 - 120 100 - 120	"Lawn Seeding"	All	4.5 - 7.5

1/ One (1) bushel/acre of rye or wheat or oats; or 10 lbs/acre of annual or perennial rye may be added to the mix for quicker green-up or stabilization.

2/ WW=Waterway Type Areas; CA=Critical Areas; HU=Heavy Use Areas; R=Reclamation

3/ Standard Seeding Dates (Spring March 15 - May 31; Summer August 1 - September 15; Dormant December 1 - March 14). Seedings may be considered from June 1 thru July 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 provide establishment. Seedings may also be considered between September 16 and November 30 (except for waterway type areas); apply the standard seeding rate during this time and apply an additional 50% of the seeding rate during the dormant period.

4/ Use the higher seeding rates for steeper slopes, reclamation areas, or poorer site conditions.

5/ Drainage: WD=Well Drained; MW=Moderately Well Drained; SPD=Somewhat Poorly Drained; PD=Poorly Drained.

6/ For close mowing and for waterways with < 2.0 ft/sec velocity.

7/ Will tolerate flooding better than other mixtures.

8/ Seed only from 4/15 to 5/15.

9/ This list is not all inclusive, other species and mixtures may be used based on the site suitability and landuser goals. Consult a NRCS state or area specialist to plan other species and mixtures.

Table 7. "Temporary Seedings" for Fields or Critical Areas

Seed Mixture ¹	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.

Table 8. Suitable pH Ranges for Various Crops and Plants¹
(Source: American Plant Food Council)

Grasses	pH Range	Tree (Continued)	pH Range
Bent Grasses	5.5 - 7.0	Fir, Balsam, Hemlock	5.0 - 6.0
Kentucky Bluegrass	5.5 - 7.0	Maple	6.0 - 7.5
Fescues	5.5 - 7.0	Black Oak	6.0 - 7.0
Orchardgrass	5.5 - 7.0	Red Oak	4.5 - 6.0
Redtop	5.5 - 7.0	White Oak	5.0 - 6.0
Reed Canarygrass	5.5 - 7.0	Jack Pine	4.5 - 5.0
Sudangrass	5.5 - 7.0	Red Pine	5.0 - 6.0
Timothy	5.5 - 7.0	White Pine	4.5 - 6.0
Warm Season Grasses	4.5 - 7.0	Yellow Pine	5.0 - 6.0
Field Crops		Scotch Pine	5.0 - 6.5
Barley	5.5 - 7.0	Norway and White Spruce	5.0 - 6.0
Velvet Bean	5.5 - 6.5	Willow	6.0 - 8.0
Buckwheat	5.3 - 6.5		
Corn	5.5 - 7.0	Legumes	
Cotton	5.5 - 6.5	Alfalfa	6.5 - 7.5
Cowpeas	5.5 - 7.0	Birdsfoot Trefoil	5.5 - 7.0
Oats	5.5 - 7.0	Alsike Clover	6.0 - 7.0
Rye	5.5 - 7.0	Ladino / White Clover	6.0 - 7.0
Sorghums	5.5 - 7.0	Crimson Clover, Annual Lespedeza	5.5 - 7.0
Soybeans	5.5 - 7.0	Mammoth & Red Clover	6.0 - 7.0
Tobacco	5.5 - 7.0	Sweet Clover	6.5 - 7.0
Wheat	5.5 - 7.0	Vetch	5.5 - 6.7
Miscellaneous		Truck Crops	
Apples	5.7 - 7.5	Asparagus	6.0 - 7.0
Azalea	5.0 - 5.5	Garden and Field Beans, Kohlrabi	5.5 - 6.5
Blueberries	5.0 - 5.5	Garden Beets	6.0 - 7.0
Cranberries	5.0 - 5.5	Sugar Beets	6.5 - 7.5
Holly	5.0 - 5.5	Brussel Sprouts & Cabbage	5.7 - 7.0
Rhododendron	5.0 - 5.5	Cantaloupe	6.0 - 6.5
		Carrots, Kale, Spinach, Swiss Chard	5.7 - 7.0
Trees		Cauliflower, Celery, Lettuce	6.0 - 7.0
Ash, Basswood, Hickory	6.0 - 7.5	Cucumber, Parsnips, Tomato	5.5 - 6.7
Beech	5.0 - 6.7	Eggplant	5.5 - 7.0
Red Cedar	5.5 - 7.0	Mustard, Peppers, Pumpkin, Radish	5.5 - 6.5
White Cedar	4.5 - 5.0	Okra, Onions, Salsify	6.0 - 6.5
Chestnut	5.0 - 6.5	Parsley	5.5 - 6.0
Box Elder	6.0 - 8.0	Garden Peas	6.0 - 7.0
American Elm	6.0 - 7.5	Irish Potato	5.0 - 5.4
		Sweet Potato	5.0 - 5.7
		Rape	6.0 - 7.5
		Squash	5.5 - 6.5
		Strawberries	5.3 - 6.5
		Turnip	5.5 - 6.5
		Watermelons	5.0 - 5.5

¹/Most crops and plants will perform best at the mid to upper pH range. Likewise the crops and plants will usually tolerate lower and higher pH's than the specified range, but do not perform as well outside the range.

Table 9 - Site Preparation for Forage Crops, Filter Strips, and Conservation Cover.

Site Preparation and Planting for Forage Crops, Filter Strips, and Conservation Cover.
No Till Method:
Preparing No Till Seedbeds. (Assumes a smooth soil surface)
a) Previous Crop was a Row Crop. Use a labeled nonselective burndown herbicide to control existing vegetation. Plant using a drill designed for no till seeding.
b) Previous Crop Existing Sod. Use a labeled nonselective burndown herbicide in September or early October the Fall prior to the planned establishment. If perennial broadleaves are a concern add 1 pint 2, 4-D per acre to the nonselective burndown herbicide. Apply the second application of nonselective burndown herbicide just before seeding. Follow all label directions when applying herbicides.
c) Calibrate drill and seed ¼ inch deep (warm season grasses) and ¼ to ½ inch deep for cool season grasses and legumes with a drill designed for no till seeding.
Conventional Seeding Method:
Preparing Conventionally Tilled Seedbeds.
A firm seedbed is important when seeding grasses and legumes. Initial tillage (plow, chisel, disc) should begin at least a month prior to seeding. About 2 weeks should be planned between initial tillage and final seedbed preparation to allow the weeds to germinate and be killed by the final seedbed preparation. A nonselective herbicide can be used prior to seeding to control weeds, especially the perennial weeds. The final seedbed should be cultipacked until firm enough to leave footprints only 1/4 to 1/2 inch deep.

Table 10. Site preparation for Critical Area Seedings.

SEEDBED PREPARATION (Where grasses and/or legumes will be seeded)
1. Prepare a firm seedbed with a disk or similar equipment. 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. Prepare the seedbed within 48 hours after applying the needed lime and fertilizer. On areas that are not accessible to seedbed preparation equipment the fertilizer can be broadcast or hydraulically applied; however, the effectiveness is reduced.

Table 11: Seeding methods.

Planting Methods:

1. **Drill Seeding:** Calibrate drill and seed $\frac{1}{4}$ inch deep (warm season grasses) and $\frac{1}{4}$ to $\frac{1}{2}$ inch deep for cool season grasses and legumes.
2. **“Air-Flow Distribution” fertilizer applicator Broadcast Seeding Procedure (Increase seeding rate by 33% with this method if the area will not be cultipacked or drag harrowed after seeding).** This has been the only broadcast method found to deliver a uniform seeding distribution. Mix the grass and/or legume seed with a fertilizer of a P₂O₅ and K₂O to be applied at a rate of 200 lbs/acre. Apply the seed and fertilizer the same day that it is mixed. Drag/harrow and cultipack once or twice after broadcast seeding to achieve seed coverage and seed-to-soil contact.
3. **Broadcast Method (Increase seeding rate by 33% with this method if the area will not be cultipacked or drag harrowed after seeding):** Broadcast the seed with a broadcast type seeder, Drag/harrow and cultipack once or twice after broadcast seeding to achieve seed coverage and seed-to-soil contact.
4. **Hydraulic/Hydroseeding - Increase seeding rate by 33% with this method if the area will not be cultipacked or drag harrowed after seeding.** Mix the seed mixture into the water, water-fertilizer, or water-fertilizer-mulch mixture and apply to the prepared area.