

Grain and Forage Crop Guide for Kentucky

AGR-18 (booklet format)

Authors: C. D. Lee, S. R. Smith, G. D. Lacefield and J. H. Herbek

Websites for more information: <http://forages.ca.uky.edu> and <http://www.kygrains.info/>

Species (Scientific Name)	Uses	Lbs per bu --- (seeds per lb) (x1000)	Desired plant density	Seeding rate per acre	Seeding depth (inches)	Seeding date	Approximate time of first harvest	Approximate annual yield [tons (T) or bushels (bu) per acre]	Comments
Alfalfa (<i>Medicago sativa</i>)	Hay, Silage, or Pasture	60 (227)	25 to 40 plants / sq. ft. seeding year	15 to 20 lb	1/4 to 1/2	Mar 15 to May 1 Aug 1 to Sep 15	May 1 to Sep 15	3 to 6 T	Correct soil acidity at least 4 months before seeding. Inoculate seed. Monitor alfalfa weevil and leafhopper and spray as recommended. Spring seeding: seed after risk of killing frost. Fall seeding: seed early to reduce risk of Sclerotinia.
Barley (<i>Hordeum vulgare</i>)	Silage, Hay --- Grain	48 (14)	25 to 30 plants / sq. ft.	2 to 3 bu (forage) ----- 75 to 100 lbs 30-35 seeds/sq. ft. (grain)	1 to 2	Sept 15 to 30 ----- Oct 1 to 15	Apr 25 to May 15 ----- June 1 to 15	5 to 8 T (65% moisture) ----- 60 to 100 bu	Control loose smut with proper seed treatment. Earliest small grain for double cropping. Very sensitive to acid soils. Not as winter hardy as wheat.
Bermudagrass, (<i>Cynodon dactylon</i>) Seeded	Hay, Pasture	40 (2,071)		5 to 10 lb (hulled seed)	1/4 (hulled seed)	Apr 15 to June 1	May 15 to Sept 15	2 to 6 T	Warm season perennial. Harvest 5 times per season for hay. Seed after risk of frost. Insure seeded variety is winterhardy in KY.
Bermudagrass (<i>Cynodon dactylon</i>) Sprigged	Hay, Pasture			15 to 20 bushels of sprigs per acre	1 to 3	Apr 15 to Jun 15	May 15 to Sep 15	3 to 7 T	Very high yielding during summer with adequate nitrogen. Good summer pasture.
Birdsfoot Trefoil (<i>Lotus corniculatus</i>)	Pasture	60 (370)		6 to 12 lb.	¼ to 1/2	Mar 1 to Apr 15	May 1 to Sep 15	1 to 3 T	Special type inoculum. Seed with bluegrass. Permit natural reseeding.
Bluestem, Big (<i>Andropogon gerardii</i>)	Wildlife, Hay, Pasture	(165)		9 to 11 lb. (PLS) pure live seed	1/4 to 1/2	Apr 15 to Jun 1	Jun 15 to Jul 15	2.5 to 3.5 T	Light, fluffy seed. Sensitive to overgrazing. Slow to establish. Seed after risk of frost.
Bluestem, Caucasian (Old World) (<i>Bothriochloa caucasica</i>)	Pasture, Hay			4 to 5 lb. PLS	1/4	Apr 15 to Jun 1	Jun 15 to Sep 15	3 to 4 T	Very tolerant of close, intensive grazing. Multiple regrowths per growing season. Very slow to establish.
Bluestem, Little (<i>Schizachyrium scoparium</i>)	Wildlife, Pasture	(260)		7 to 9 lb. PLS	1/4	Apr 15 to Jun 1	June 15 to Sept 15	1.5 to 2 T	Primarily used in native grass mixtures at rates of 1 to 2 lb/Ac. Sensitive to overgrazing. Upright, bunchgrass similar in appearance to broomsedge. Slow to establish.

Species (Scientific Name)	Uses	Lbs per bu - - - (seeds per lb) (x1000)	Desired plant density	Seeding rate per acre	Seeding depth (inches)	Seeding date	Approximate time of first harvest	Approximate annual yield [tons (T) or bushels (bu) per acre]	Comments
Bromegrass, Smooth (<i>Bromus inermis</i>)	Hay, Pasture ----- Seed	14 (135)		15 to 20 lb.	¼ to 1/2	Primary: Aug 20 to Sept 20 Secondary: Feb 15 to Apr 1	May 5 to 25	1.5 – 3.5 T ----- 150 – 400 lb	Slow regrowth after first hay harvest. Sensitive to overgrazing. Drought tolerant. Slow to establish, but good longevity once established.
Buckwheat (<i>Fagopyrum sp.</i>)	grain	60		½ to 1 bu	1 to 2	July 1 to July 30	Sept 20 to Oct 10	10 to 20 bu	
Clover, Alsike (<i>Trifolium hybridum</i>)	Hay, Pasture	60 (728)		4 to 6 lb	1/4	Feb 1 to Apr 15 Aug 1 to Sept 10	June 1 to Sept 15	1 to 2 T	Inoculate. Better adapted to poorly drained soils than red clover. Little advantage over white clover in KY.
Clover, Crimson (<i>Trifolium incarnatum</i>)	Hay, Pasture	60 (150)		20 to 30 lb.	1/4 to 1/2	Aug 1 to Oct 15	May 1 to May 15	1 to 2.5 T	Inoculate. Annual clover. Fall planted for spring forage production or as a plow down crop.
Clover, Red (<i>Trifolium pratense</i>)	Hay, Pasture	60 (272)		8 to 12 lb.	1/4 to 1/2	Primary: Feb 1 to Apr 15 ----- Secondary: Aug 1 to Sep 15	May 1 to Sept. 15	2 to 5 T	Inoculate. Don't graze or clip after Sept. 15 until after freeze. Use improved varieties for 2 to 3 year stands.
Clover, Sweet (<i>Melilotus spp.</i>)	Cover	60 (259)		10 - 15 lb.	¼ to 1/2	Feb 1 to Apr 1			Inoculate. Used mainly as a plow down crop. Use only low coumarin varieties.
Clover, White (Ladino and Dutch or Common types) (<i>Trifolium repens</i>)	Pasture	60 (768)		1 to 3 lb	1/4	Feb 1 to Apr 15	Aug 1 to Sept 10	1 to 3 T	Good for all permanent pasture mixtures. Inoculate. Use ladino type for higher forage yield.
Corn (<i>Zea mays</i>)	Grain, Silage, Stockpile grazing	56	22,000 to 30,000 plants/A	22,000 to 30,000 seeds (grain) 24,000 to 30,000 seeds (silage) 26,000 to 32,000 (irrigated)	1 to 2	April 1 to May 20	Aug 15 to Sept 15 (forage) Sept 1 to Oct 30 (grain)	15 to 25 T (forage, 65% moisture) ----- 120 to 200 bu	Increased use of grazing standing crop (stockpiled) during winter. Can plant as deep as 3 inches when soil surface is dry. Ideal planting dates: Western and central KY: April 1 to May 5; eastern KY: April 15 to May 20 Grain (row spacings less than 30-inches not needed for Kentucky).

Species (Scientific Name)	Uses	Lbs per bu - - - (seeds per lb) (x1000)	Desired plant density	Seeding rate per acre	Seeding depth (inches)	Seeding date	Approximate time of first harvest	Approximate annual yield [tons (T) or bushels (bu) per acre]	Comments
Cowpeas (<i>Vigna unguiculata</i>)	Cover crop, Hay	60 (4)		1 to 2 bu	1 to 3	May 15 to July 1	Aug 1 1 to Oct 1	2 T	Inoculate, short term summer legume. Sometimes mixed with warm season annuals.
Crownvetch (<i>Coronilla varia</i>)	Cover	55		20 lb	1/2	Apr 1 to May 15			Inoculate. Used mainly for roadbanks.
Eastern Gamagrass (<i>Tripsacum dactyloides</i>)	Grazing, Hay			7 to 10 lb.	½ to 1	Apr 15 to Jun 15	June 1	4 to 6 T	Highest quality native warm season perennial. Slow to establish.
Fescue, Tall (<i>Festuca arundinacea</i>)	Hay, Pasture	22 (227)		15 to 25 lb	1/4 to 1/2	Primary Aug 20 to Oct 1 Secondary Feb. 15 to Apr 15	May 1 to May 20	2 to 4 T	KY31 variety contains fungal endophyte that causes toxicity in livestock. Use low endophyte or novel endophyte varieties.
Gramma, Side Oats (<i>Bouteloua curtipendula</i>)	Wildlife, Pasture	(190)		8 to 10 lb.	1/4 to 1/2	Apr 15 - June 1	June 15 to Sept 15	1.5 to 2 T	Primarily used in mixtures at 1 to 2 lb/ac. Sensitive to overgrazing. Slow to establish.
Indiangrass (<i>Sorghastrum nutans</i>)	Hay, Pasture, Wildlife	(175)		9 to 11 lb.	1/4 to 1/2	Apr 15 to Jun 1	Jul 15 to Sept 15	2 to 4 T	Light, fluffy seed. Needs special drills for no-till seeding. Latest maturity of native grasses. Sensitive to overgrazing and slow to establish.
Kentucky Bluegrass (<i>Poa pratensis</i>)	Pasture	14 (4800)		10 to 15 lb	1/4	Primary: Aug 15 to Sept 15 Secondary: Feb 15 to Apr 15	May 1 to May 15	1 to 3	Tolerant to close grazing, lower forage yield than other cool season grasses.
Lespedeza, Annual (<i>Kummerowia stipulacea</i> - Korean; <i>K. striata</i> - Kobe or Striate types)	Pasture, Hay	30 (240)		20 to 25 lb.	1/4	Feb 15 – Apr 1	Aug 15	1 to 2.5 T	Inoculate. Annual warm season legume. Tolerant to low pH and low P.
Lespedeza, Perennial (Sericea) (<i>Lespedeza cuneata</i>)	Hay, Pasture	60 (372) hulled seed		35 (scarified)	1/4	Mar 15 to Apr 15	Hay - May 15 to Sep 15	1 to 3 T	Harvest at an immature stage of growth to maintain quality (12 – 14" high). Inoculate. Used mainly for soil conservation purposes.

Species (Scientific Name)	Uses	Lbs per bu - - - (seeds per lb) (x1000)	Desired plant density	Seeding rate per acre	Seeding depth (inches)	Seeding date	Approximate time of first harvest	Approximate annual yield [tons (T) or bushels (bu) per acre]	Comments
Millet, Foxtail (German) (<i>Setaria italica</i>)	Hay, pasture	50 (213)		20 to 30 lb	1/2 to 3/4	May 1 to Aug 1	Aug 15 to Oct 1	1.5 to 3 T	Main use for wildlife feed. Can be used as an emergency hay crop or pasture. Used as a smother crop when reestablishing pasture.
Millet, Pearl (<i>Pennisetum glaucum</i>)	Pasture, Silage	50 (82)		5 to 7 lb in rows, 15 to 25 broadcast	1/2 to 3/4	May 1 to Aug 1	June 15 to Oct 15	2 to 5 tons.	Good for summer pasture. Potential for nitrate problems (see ASC-57 for more details).
Oats, Winter and Spring (<i>Avena sativa</i>)	Hay, Silage ----- Grain	32 (15)	25 to 30 plants / sq. ft.	2.5 to 3 bu (forage) ----- 60 to 90lbs (grain)	1 to 2 ----- 1 to 2	Mar 1 to Apr 1, Sept 15 to 30 ----- Oct 1 to 15	May 20 to June 10 ----- July 1 to 10	4 to 9 T (65% moisture) ----- 50 to 80 bu	Spring oats are seeded as a grain crop, or as emergency hay or silage. Winter oats are least winter hardy of small grains. Preferred companion crop when seeding perennial forages since they are the least competitive small grain.
Orchardgrass (<i>Dactylis glomerata</i>)	Hay or pasture	14 (416)		15 to 25 lb	1/4 to 1/2	Primary: Aug 20 to Sept 20 ----- Secondary: Feb 15to April 15	May 1 to 20 ----- Jul 1 - 15	2 to 4 T ----- 150 – 250 lb	High quality, high yielding cool season grass. Preferred grass for mixtures with alfalfa. Can become clumpy over time.
Rapeseed, Winter (Canola) (<i>Brassica napus</i>)	Seed	50 (80 to 150)	5 to 10 plants / sq. ft.	4 to 8 lb	3/8 to 1	Sept 1 to Oct 1	June 5 to 20	40 to 60 bu	Primarily used for vegetable oil. Use low glucosinolate varieties for forage. Canola refers to low glucosinolate, low erucic acid rapeseed.
Reed Canarygrass (<i>Phalaris arundinacea</i>)	Hay	47 (480)		8 to 12	1/4 to 1/2	Primary: Aug 20 to Sept 20 Secondary: Feb 15 to Apr 15	May 25 to June 10	2 to 4 T	Does well in poorly drained areas, but difficult to establish. Low quality at maturity.
Rye (<i>Secale cereale</i>)	Pasture or Silage ----- Grain	56 (18)	25 to 30 plants / sq. ft.	1 ½ to 2 ½ bu (forage) ----- 56 to 90 lbs (grain)	1 to 2	Forage Sept 1 to Oct 15 ----- Grain Oct 15 to 30	Apr 20 + ----- June 15 to 30	5 to 10 T at 65% moisture ----- 30 to 60 bu	Cut for silage in boot stage. Excellent for grazing and no-till mulch. Best small grain for fall grazing.
Ryegrass, Annual (<i>Lolium multiflorum</i>)	Pasture, Silage or Hay	24 (224)		20 to 30 lb.	¼ to 1/2	Aug 15 to Oct 1	Mar 15 to May 15 J	11/2 to 3 T	Used mainly as cover crop or for grazing. Increased use for round bale silage.

Species (Scientific Name)	Uses	Lbs per bu - - - (seeds per lb) (x1000)	Desired plant density	Seeding rate per acre	Seeding depth (inches)	Seeding date	Approximate time of first harvest	Approximate annual yield [tons (T) or bushels (bu) per acre]	Comments
Ryegrass, Perennial (<i>Lolium perenne</i>)	Hay, Pasture	24 (330)		15 to 25 lb.	¼ to 1/2	Primary: Aug 20 to Oct 1 Secondary: Feb 1 to Apr 15	Apr 20 to May 10	2 to 4 T	Use winter hardy varieties. Average stand length in Kentucky is 2 years. High fertility soils and/or irrigation can extend stand life.
Sorghum, Forage (<i>Sorghum bicolor</i>)	Silage	56 (24)		15 to 20 lb.	1.5	May 1 to July 1	Aug 15 to Sept 20	15 to 25 T (65% moisture)	Sorghum/sudangrass hybrid more commonly used for forage (see below).
Sorghum, Grain (Milo) (<i>Sorghum bicolor</i>)	Grain	56 (13 to 20)	60,000 to 100,000 plants/A	90,000 to 140,000 seeds/A 6 to 9 lbs/A	1 to 1.5	May 1 to June 10	Sept 20 to Oct 20	60 to 120 bu	Plant when soil temperatures are above 65-70°F. Can be seeded as late as July 1 for double cropping.
Sorghum, Sweet (Syrup) (<i>Sorghum bicolor</i>)	Food	50 (21)		2.5 to 3 lb 2 to 3 seed/ft	1	May 1 to June 10	Sept 1 to Oct 15	150 to 250 gal	Harvest earlier by transplanting using float system.
Soybean (<i>Glycine max</i>)	Silage or Hay ----- Grain	60 (2.5 to 3.5)	90,000 to 150,000 plants/A	1 to 1 ½ bu (forage) ----- 110,000 to 170,000 seeds (grain)	1 to 2	May 1 to June 10	Aug 1 to Sept 30 (hay) ----- Sept 15 to Oct 30	2 to 4 T ----- 35 to 70 bu	Seed size varies by variety. High end of seed rate range for narrow rows and late planting. Inoculate if field has been out of soybean for 3 to 5 years. Can be seeded as late as July 1 for double cropping. Maturity Groups III to early V best suited for KY.
Sudangrass and Sorghum x Sudan Hybrids (<i>Sorghum bicolor</i>)	Pasture, silage, or hay	40 (35 to 43)		20 to 40 lb	1/2 to 2	May 10 to Aug 1	June 15 to Oct 15	2 to 5 T	Excellent warm season annual pasture or silage crop. Smaller stemmed sudangrass preferred for hay production. Potential for prussic acid and nitrate problems (see ASC-57 for more details).
Sunflowers (<i>Helianthus annuus</i>)	Bird feed	30	17,000 to 20,000 plants/A	18,000 to 22,000 seeds/A	1 to 2	Apr 1 to May 10	Sept	0.5 to 1 T	Not recommended for oil crop production in Kentucky. Could be planted as late as June 20 for double cropping.
Switchgrass (<i>Panicum virgatum</i>)	Hay, Pasture, Wildlife	(389)		6 to 8 lb.	1/4 to 1/2	Apr 15 to May 1	Jun 1 to Sept 15	3 to 5 T	Slick, free-flowing seed. Most tolerant of wet soils of all native grasses. Sensitive to overgrazing. Slow to establish.
Timothy (<i>Phleum pratense</i>)	Hay	45 (1,152)		6 to 8 lb.	1/4 to 1/2	Aug 20 to Oct 1	May 20 to June 10	1 to 3 T	Timothy is desired by some horse owners, but is essentially a one-cut hay crop in Kentucky and average stand length of 2 to 3 years.

Species (Scientific Name)	Uses	Lbs per bu - - - (seeds per lb) (x1000)	Desired plant density	Seeding rate per acre	Seeding depth (inches)	Seeding date	Approximate time of first harvest	Approximate annual yield [tons (T) or bushels (bu) per acre]	Comments
Triticale (Triticum x Secale)	silage ----- grain	50 (15)	25 to 30 plants / sq. ft.	2 to 2.5 bu (forage) ----- 75 to 100 lb (grain) 30 to 35 seeds per sq. ft ²	1 to 2	Oct 1 – 30	May 10 to Jun 1 ----- June 10 to 25	4 to 10 T (65% moisture) ----- 40 to 70 bu	Hybrid between wheat and rye. Cut for silage in boot stage. Use winter varieties. Newer varieties have comparable yields to wheat.
Turnips and related brassicas (<i>Brassica rapa</i> , <i>Brassica spp.</i>)	Pasture	55		3 to 6 lb	1/4	Apr 1 to June 1 Aug 1 to Sept 1	June 15 to Nov 15	2 to 4 T	Very high quality pasture (85% digestibility). Often dry hay fed when grazing to add fiber or seeded in mixtures with small grains. New varieties show improved regrowth after grazing.
Vetch, Big Flower (<i>Vicia grandiflora</i>)	Forage	60 (32)		20 to 30 lb	1 to 2	Aug 1 to Sept 10	April to May	1.5 to 2.03 T 0 to 600 lb seed	
Vetch, Hairy (<i>Vicia villosa</i>)	Forage	60 (16)		20 to 30 lb ²	1 to 2	Aug 1 to Sept 10	June 20 to July 5	400 to 600 lb seed	
Wheat (<i>Triticum aestivum</i>)	Grain, Silage, Cover Crop	60 (11)	25 to 30 plants / sq. ft.	2 to 2.5 bu (forage) ----- 90 to 150 lb (grain) 30 to 35 seeds per sq. ft	1 to 2	Oct 1 to 15 (Hessian fly-free date Oct 6 to 15) (forage) ----- Oct 10 to 30 (grain)	May 10 to June 1 (forage) ----- June 10 to 25 (grain)	6 to 10 T (forage, 65% moisture) ----- 50 to 80 bu	Excellent quality silage or feed grain. Cut for silage shortly after heading. Seed size varies by variety.