

Grain and Forage Crop Guide for Kentucky

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 Web sites for more information: www.uky.edu/Ag/Forage and <http://www.uky.edu/Ag/GrainCrops/>

Uses	Seed Size: lb/bu or (seeds/lb)	Desired Plant Density	Seeding Rate/A	Seeding Depth (inches)	Seeding Date	First Harvest ¹	Annual Yield ²	Comments
Alfalfa — <i>Medicago sativa</i>								
hay, silage, pasture	60 (227,000)	25-40 plants/ sq. ft. seeding year	15-20 lb	¼-½	Primary: Mar 15- May 1 Secondary: Aug 1- Sep 15	May 1- Sep 15	3-6 T	Correct soil acidity at least 4 months before seeding. Inoculate seed. Monitor alfalfa weevil and leafhopper, and spray as recommended. <i>Spring seeding:</i> seed after risk of killing frost. <i>Fall seeding:</i> seed early to reduce risk of Sclerotinia.
Barley — <i>Hordeum vulgare</i>								
silage, hay ----- grain	48 (14,000)	25-30 plants/ sq. ft.	2-3 bu (forage) ----- 75-100 lb 30-35 seeds/sq. ft. (grain)	1-2	Sep 15-30 ----- Oct 1-15	Apr 25- May 15 ----- Jun 1-15	5-8 T (65% moisture, forage) ----- 60-100 bu (grain)	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, Seeded — <i>Cynodon dactylon</i>								
hay, pasture	40 (2,071,000)		5-10 lb (hulled seed)	¼ (hulled seed)	Apr 15- Jun 1	May 15- Sep 15	2-6 T	Warm-season perennial. Harvest 5 times per season for hay. Seed after risk of frost. Ensure seeded variety is winter-hardy in Kentucky.
Bermudagrass, Sprigged — <i>Cynodon dactylon</i>								
hay, pasture			15-20 bu of sprigs per acre	1-3	Apr 15- Jun 15	May 15- Sep 15	3-7 T	Very high yielding during summer with adequate nitrogen. Good summer pasture.
Bird's-foot Trefoil — <i>Lotus corniculatus</i>								
pasture	60 (370,000)		6-12 lb	¼-½	Mar 1- Apr 15	May 1- Sep 15	1-3 T	Special type inoculum. Seed with bluegrass. Permit natural reseeding.
Bluestem, Big — <i>Andropogon gerardii</i>								
wildlife, hay, pasture	(165,000)		9-11 lb PLS ³	¼-½	Apr 15- Jun 1	Jun 15- Jul 15	2½-3½ 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			4-5 lb PLS ³	¼	Apr 15- Jun 1	Jun 15- Sep 15	3-4 T	Very tolerant of close, intensive grazing. Multiple regrowths per growing season. Very slow to establish.
Bluestem, Little — <i>Schizachyrium scoparium</i>								
wildlife, pasture	(260,000)		7-9 lb PLS ³	¼	Apr 15- Jun 1	Jun 15- Sep 15	1½-2 T	Primarily used in native grass mixtures at rates of 1 to 2 lb/A. Sensitive to overgrazing. Upright, bunchgrass similar in appearance to broom sedge. Slow to establish.

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Bromegrass, Smooth — <i>Bromus inermis</i>								
hay, pasture ----- seed	14 (135,000)		15-20 lb	¼-½	<i>Primary:</i> Aug 20- Sep 20 <i>Secondary:</i> Feb 15- Apr 1	May 5-25	1½-3½ T ----- 150-400 lb (seed)	Slow regrowth after first hay harvest. Sensitive to overgrazing. Drought tolerant. Slow to establish, but good longevity once established.
Buckwheat — <i>Fagopyrum</i> sp.								
grain	60		1/2-1 bu	1-2	Jul 1- Jul 30	Sep 20- Oct 10	10-20 bu	
Clover, Alsike — <i>Trifolium hybridum</i>								
hay, pasture	60 (728,000)		4-6 lb	¼	<i>Primary:</i> Feb 1- Apr 15 <i>Secondary:</i> Aug 1- Sep 10	Jun 1- Sep 15	1-2 T	Inoculate. Better adapted to poorly drained soils than red clover. Little advantage over white clover in Kentucky.
Clover, Crimson — <i>Trifolium incarnatum</i>								
hay, pasture	60 (150,000)		20-30 lb	¼-½	Aug 1- Oct 15	May 1- May 15	1-2½ 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 (272,000)		8-12 lb	¼-½	<i>Primary:</i> Feb 1- Apr 15 <i>Secondary:</i> Aug 1- Sep 15	May 1- Sep 15	2-5 T	Inoculate. Do not graze or clip after Sept. 15 until after freeze. Use improved varieties for 2- to 3-year stands.
Clover, Sweet — <i>Melilotus</i> spp.								
cover crop	60 (259,000)		10-15 lb	¼-½	Feb 1- 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 (768,000)		1-3 lb	¼	Feb 1- Apr 15	Aug 1- Sep 10	1-3 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- 30,000 plants/A	22,000-30,000 seeds (grain, stockpile grazing) 24,000-33,000 seeds (silage) 26,000- 32,000 seeds (irrigated grain)	1-2	Apr 1- May 20	Aug 15- Sep 15 (forage) ----- Sep 1 to Oct 30 (grain)	15-25 T (65% moisture, forage) ----- 120-200 bu (grain)	Increased use of grazing standing crop (stockpiled) during winter. Can plant as deep as 3 inches when soil surface is dry. Ideal planting dates: <i>western and central Kentucky</i> —April 1-May 5; <i>eastern Kentucky</i> —April 15-May 20. Grain (row spacings less than 30 inches not needed for Kentucky).
Cowpeas — <i>Vigna unguiculata</i>								
cover crop, hay	60 (4,000)		1-2 bu	1-3	May-June	Sep 11- Oct 1	2 T	Inoculate, short-term summer legume. Sometimes mixed with warm-season annuals.
Crownvetch — <i>Coronilla varia</i>								
cover crop	55		20 lb	½	Apr 1- May 15			Inoculate. Used mainly for roadbanks.
Eastern Gamagrass — <i>Tripsacum dactyloides</i>								
grazing, hay			7-10 lb	½-1	Apr 15- Jun 15	Jun 1	4-6 T	Highest quality native warm-season perennial. Slow to establish.

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Fescue, Tall — <i>Festuca arundinacea</i>								
hay, pasture	22 (227,000)		15-25 lb	¼-½	Primary: Aug 20- Oct 1 Secondary: Feb 15- Apr 15	May 1-20	2-4 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	(190,000)		8-10 lb	¼-½	Apr 15- Jun 1	Jun 15- Sep 15	1½-2 T	Primarily used in mixtures at 1-2 lb/A. Sensitive to overgrazing. Slow to establish.
Indiangrass — <i>Sorghastrum nutans</i>								
hay, pasture, wildlife	(175,000)		9-11 lb	¼-½	Apr 15- Jun 1	Jul 15- Sep 15	2-4 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 (4,800,000)		10-15 lb	¼	Primary: Aug 15- Sep 15 Secondary: Feb 15- Apr 15	May 1-15	1-3 T	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 (240,000)		20-25 lb	¼	Feb 15- Apr 1	Aug 15	1-2½ T	Inoculate. Annual warm-season legume. Tolerant to low pH and low P.
Lespedeza, Perennial —(Sericea) <i>Lespedeza cuneata</i>								
hay, pasture	60 (372,000) hulled seed		35 (scarified) lb	¼	Mar 15- Apr 15	Hay: May 15- Sep 15	1-3 T	Harvest at an immature stage of growth to maintain quality (12-14" high). Inoculate. Used mainly for soil conservation purposes.
Millet, Foxtail (German) — <i>Setaria italica</i>								
hay, pasture	50 (213,000)		20-30 lb	½-¾	May 1- Aug 1	Aug 15- Oct 1	1½-3 T	Used mainly 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 (82,000)		5-7 lb in rows, 15-25 broadcast	½-¾	May 1-Aug 1	Jun 15- Oct 15	2-5 T	Good for summer pasture. Potential for nitrate problems (see ASC-57, <i>Cattle-Related Forage Disorders</i> , for more details).
Oats, Winter and Spring — <i>Avena sativa</i>								
hay, silage ----- grain	32 (15,000)	25-30 plants/ sq. ft.	2.5-3 bu (forage) ----- 60-90 lb (grain)	1-2 ----- 1-2	Mar 1- Apr 1, Sep 15-30 ----- Oct 1-15	May 20- Jun 10 ----- Jul 1-10	4-9 T (65% moisture, forage) ----- 50-80 bu (grain)	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, pasture	14 (416,000)		15-20 lb	¼-½	Primary: Aug 20- Sep 20 Secondary: Feb 15- Apr 15	Primary: May 1-20 Secondary: Jul 1-15	2-4 T 150-250 lb	High-quality, high-yielding cool-season grass. Preferred grass for mixtures with alfalfa. Can become clumpy over time.

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Rapeseed, Winter (Canola) — <i>Brassica napus</i>								
seed	50 (80,000- 150,000)	5-10 plants/ sq. ft.	4-8 lb	3/8-1	Sep 1- Oct 1	Jun 5-20	40-60 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 (480,000)		8-12 lb	1/4-1/2	<i>Primary:</i> Aug 20- Sep 20 <i>Secondary:</i> Feb 15- Apr 15	May 25- Jun 10	2-4 T	Does well in poorly drained areas but difficult to establish. Low quality at maturity.
Rye — <i>Secale cereale</i>								
pasture, silage ----- grain	56 (18,000)	25-30 plants/ sq. ft.	1.5-2.5 bu (forage) ----- 56-90 lb (grain)	1-2	Sep 1- Oct 15 (forage) ----- Oct 15-30 (grain)	Apr 1-20 ----- Jun 15-30	5-10 T (65% moisture, forage) ----- 30-60 bu (grain)	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, hay	24 (224,000)		20-30 lb	1/4-1/2	Aug 15- Oct 1	Mar 15- May 15	1 1/2-3 T	Used mainly as cover crop or for grazing. Increased use for round bale silage.
Ryegrass, Perennial — <i>Lolium perenne</i>								
hay, pasture	24 (330,000)		15-25 lb	1/4-1/2	<i>Primary:</i> Aug 20- Oct 1 <i>Secondary:</i> Feb 1-Apr 15	Apr 20- May 10	2-4 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 (24,000)		15-20 lb	1 1/2	May 1- Jul 1	Aug 15- Sep 20	15-25 T (65% moisture, forage)	Sorghum/sudangrass hybrid more commonly used for forage.
Sorghum, Grain (Milo) — <i>Sorghum bicolor</i>								
grain	56 (13,000- 20,000)	60,000- 100,000 plants/A	90,000- 140,000 seeds or 6-9 lb	1-1 1/2	May 1- Jun 10	Sep 20- Oct 20	60-120 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 (21,000)		2.5-3 lb 2-3 seed/ft	1	May 1- Jun 10	Sep 1- Oct 15	150-250 gal	Harvest earlier by transplanting using float system.
Soybean — <i>Glycine max</i>								
silage, hay ----- grain	60 (2,500- 3,500)	90,000- 150,000 plants/A	1-1.5 bu (forage) ----- 110,000- 170,000 seeds (grain)	1-2	May 1- Jun 10	Aug 1- Sep 30 (hay) ----- Sep 15- Oct 30 (grain)	2-4 T ----- 35-70 bu (grain)	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 3-5 years. Can be seeded as late as July 1 for double cropping. Maturity groups III to early V best suited for Kentucky.
Sudangrass and Sorghum x Sudan Hybrids (Sorghum bicolor)								
pasture, silage, hay	40 (35,000- 43,000)		20-40 lb	1/2-2	May 10- Aug 1	Jun 15- Oct 15	2-5 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, <i>Cattle-Related Forage Disorders</i> , for more details).

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Sunflowers — <i>Helianthus annuus</i>								
bird feed	30	17,000- 20,000 plants/A	18,000-22,000 seeds	1-2	Apr 1- May 10	Sep	½-1 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	(389,000)		6-8 lb	¼-½	Apr 15- May 1	Jun 1- Sep 15	3-5 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 (1,152,000)		6-8 lb	¼-½	Aug 20- Oct 1	May 20- Jun 10	1-3 T	Timothy is desired by some horse owners but is essentially a one-cut hay crop in Kentucky. Average stand length of 2-3 years.
Triticale — <i>Triticum x Secale</i>								
silage ----- grain	50 (15,000)	25-30 plants/ sq. ft.	2-2.5 bu (forage) ----- 30-35 seeds/sq. ft. (75-100 lb) (grain)	1-2	Oct 1-30	May 10- Jun 1 (forage) ----- Jun 10-25 (grain)	4-10 T (65% moisture, forage) ----- 40-70 bu (grain)	Hybrid between wheat and rye. Cut for silage in boot stage. Use winter varieties. Newer varieties have comparable yields to wheat.
Turnips and related <i>brassic</i> as— <i>Brassica rapa</i> , <i>Brassica</i> spp.								
pasture	55		3-6 lb	¼	Apr 1- Jun 1 ----- Aug 1- Sep 1	Jun 15 ----- Nov 15	2-4 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 (32,000)		20-30 lb	1-2	Aug 1- Sep 10	Apr-May	1.5-2.03 T 0-600 lb (seed)	
Vetch, Hairy — <i>Vicia villosa</i>								
forage	60 (16,000)		20-30 lb	1-2	Aug 1- Sep 10	Jun 20- Jul 5	400-600 lb (seed)	
Wheat — <i>Triticum aestivum</i>								
grain, silage, cover crop	60 (11,000)	25-30 plants/ sq. ft.	2-2.5 bu (forage) ----- 30-35 seeds/sq. ft. (90-150 lb) (grain)	1-2	Oct 1-15 (Hessian fly-free date Oct 6-15) (forage, cover crop) ----- Oct 10-30 (grain)	May 10- Jun 1 (forage) ----- Jun 10-25 (grain)	6-10 T (65% moisture, forage) ----- 50-80 bu (grain)	Excellent quality silage or feed grain. Cut for silage shortly after heading. Seed size varies by variety. High-yielding grain varieties do not guarantee high-yielding forage or straw. Consult the University of Kentucky variety trials bulletin for specific yield information.
¹ Approximate date.								
² Approximate yield in units (tons, bushels, pounds, or gallons) per acre.								
³ PLS = pure live seed.								

Typical First and Last Occurrences of 32°F in Kentucky

Location	Coordinates (°)	Date of First Fall Frost ^a					Date of Last Spring Frost ^{a,b}				
		Median	Early	10%	90%	Late	Median	Early	10%	90%	Late
Ashland	38.47N 82.63W	10/16	9/08	9/22	11/03	1/01	5/04	4/11	4/14	5/11	6/12
Berea	37.57N 84.31W	10/24	9/24	10/06	11/13	11/21	4/11	3/25	3/28	5/04	5/10
Bowling Green	36.98N 84.44W	10/22	10/03	10/08	11/08	11/13	4/11	3/21	3/26	4/25	5/05
Carrollton	38.65N 85.17W	10/19	10/03	10/06	11/02	11/08	4/21	4/03	4/08	5/05	5/10
Covington	39.01N 84.51W	10/19	10/02	10/04	11/02	11/08	4/21	3/26	4/10	5/06	5/10
Farmers	38.15N 83.54W	10/15	9/21	10/03	11/02	11/08	5/02	4/04	4/11	5/15	5/27
Hopkinsville	36.85N 87.46W	10/20	9/21	10/05	11/06	11/13	4/11	3/21	3/26	4/25	5/05
Leitchfield	37.46N 86.29W	10/18	10/03	10/05	11/06	11/08	4/19	3/22	4/04	5/08	5/11
Lexington	38.03N 84.44W	10/25	10/02	10/07	11/09	11/13	4/18	3/26	4/04	5/03	5/10
London	37.13N 84.07W	10/12	9/23	10/03	11/02	11/13	4/24	3/22	4/07	5/09	5/27
Mayfield	36.72N 88.64W	10/20	10/02	10/06	11/06	11/12	4/15	3/24	4/05	4/26	5/05
Maysville	38.61N 83.81W	10/21	10/03	10/04	11/03	11/08	4/24	3/27	4/02	5/09	5/27
Middlesboro	36.62N 83.73W	10/17	9/29	10/04	11/04	11/14	5/01	4/08	4/12	5/11	5/27
Monticello	36.85N 84.83W	10/17	10/03	10/04	11/05	11/13	4/25	4/03	4/08	5/08	5/27
Murray	36.62N 88.31W	10/30	10/03	10/14	11/18	11/21	4/04	3/18	3/20	4/15	4/20
Owensboro	37.77N 87.11W	10/20	10/03	10/06	11/07	11/13	4/10	3/21	3/25	4/24	5/05
Paducah	37.08N 88.62W	10/26	10/03	10/09	11/12	11/13	4/08	3/07	3/22	4/18	4/23
Princeton	37.09N 87.89W	10/20	10/03	10/06	11/06	11/13	4/10	3/21	3/26	4/21	3/26
Scottsville	36.74N 86.18W	10/24	10/07	10/10	11/14	11/21	4/10	3/21	3/27	4/27	5/27
Shelbyville	38.21N 85.21W	10/14	9/21	10/01	10/31	11/19	4/23	3/27	4/06	5/11	5/18
Somerset	37.08N 84.61W	10/13	10/03	10/04	10/31	11/05	4/22	3/22	4/07	5/10	5/27
West Liberty	37.91N 83.26W	10/09	9/15	9/24	10/17	11/04	5/05	3/29	4/17	5/21	5/27
Williamsburg ^c	36.74N 84.17W	10/19	9/26	10/04	11/07	11/13	4/22	4/04	4/08	5/10	5/27

^a Temperatures are recorded by the University of Kentucky Agricultural Weather Service at 5 feet above ground and based on 30 years of data from 1961 to 1990.

^b Median = date directly between the earliest and latest date of observed last occurrence; Early = earliest date recorded for last occurrence; 10% = date for last occurrence in one out of 10 years; 90% = date for last occurrence in nine out of 10 years; Late = latest date recorded for last occurrence.

^c 28 years of data.

Source: University of Kentucky Agricultural Weather Center, Kentucky Climate Analysis, URL: <http://www.wagwx.ca.uky.edu/analysis2/>.