

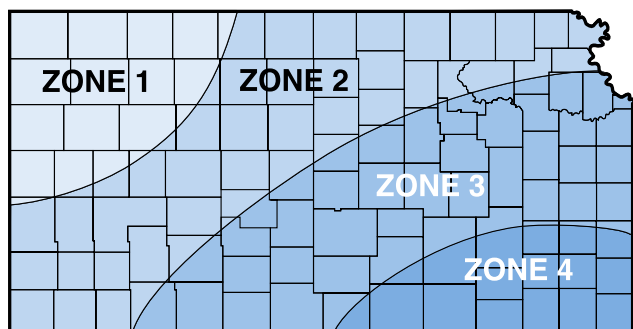
# Kansas Crop Planting Guide



**K**ansas is agronomically rich, with diverse soils and growing conditions. The average number of freeze-free days ranges from 150 in the northwest to 200 in southeastern Kansas. The average date of the last 32°F freeze in the spring is May 5 in the northwest and April 10 in the southeast. The average date of the first 32°F fall freeze is October 5 for the northwest and October 25 for the southeast.

Our rich soils and climatic conditions make Kansas the number one state in wheat and grain sorghum production. These conditions not only dictate the type of crop that will grow, but also cause wide differences in the optimum planting dates and seeding rates across the state. It is important that producers recognize optimum planting dates and rates for various crops, but just as important, producers need to recognize and understand the differences between growing conditions on their farms and those of their neighbors.

Tables in this publication show ranges of optimum planting rates and dates for various crops within a given zone.



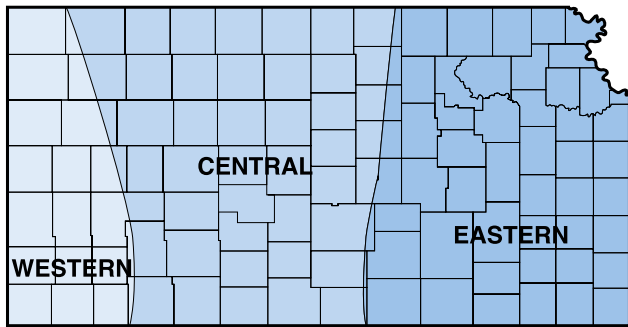
## Planting Dates

Generally, the earlier planting dates of the planting range are for spring-planted crops in eastern and southern areas, while for fall-planted crops, they apply to northern and western areas (**Table 1**).

**Table 1. Suggested planting dates for Kansas crops.**

Crop	Zone 1	Zone 2	Zone 3	Zone 4
Wheat	Sept 10–30	Sept 15–Oct 20	Sept 25–Oct 20	Oct 5–25
Triticale	Aug 20–Sept 15	Aug 20–Sept 25	Sept 1–25	Sept 1–Oct 1
Winter barley	Sept 10–20	Sept 10–Oct 5	Sept 15–Oct 10	Sept 20–Oct 10
Spring barley	Feb 25–Mar 15	Feb 25–Mar 15	Feb 25–Mar 15 <sup>1</sup>	Not recommended
Spring wheat <sup>1</sup>	Feb 25–Mar 15	Feb 25–Mar 15	Feb 25–Mar 15	Not recommended
Winter oats	Not recommended	Not recommended	Not recommended	Sept 20–Oct 10
Spring oats	Mar 5–20	Feb 25–Mar 15	Feb 25–Mar 15	Feb 20–Mar 15
Corn	Apr 20–May 20	Apr 15–May 20	Apr 1–May 10	Mar 25–Apr 25
Sorghums	May 15–June 10	May 15–June 20	May 15–June 20	May 1–15/June 5–25
Sudangrass	May 15–July 1	May 20–July 10	May 20–July 10	May 20–July 10
Soybeans	May 10–June 1 Irr.	May 5–June 10	May 5–June 10 W <sup>1/2</sup> May 15–June 15 E <sup>1/2</sup>	May 10–June 25 W <sup>1/2</sup> June 1–30 E <sup>1/2</sup>
Alfalfa				
Fall	Aug 10–30	Aug 15–Sept 10	Aug 15–Sept 10	Aug 15–Sept 15
Spring	Apr 25–June 1	Apr 20–May 10	Apr 10–May 10	Apr 10–May 10
Sweet clover				
Fall	Not recommended	Aug 15–Sept 10 E <sup>1/3</sup>	Aug 15–Sept 10 E <sup>1/2</sup>	Aug 15–Sept 10
Spring	Mar 5–20	Mar 1–15	Mar 1–15	Feb 20–Mar 15
Red clover	Not recommended	Mar 1–15 E <sup>1/3</sup>	Mar 1–15 E <sup>1/3</sup>	Feb 20–Mar 15
Millets				
Pearl	June 1–July 1	June 1–July 1	June 1–July 1	June 1–July 1
Proso	June 1–July 1	June 1–July 1	June 1–July 1	June 1–July 1
Foxtail	June 1–July 1	June 1–July 1	June 1–July 1	June 1–July 1
Lespedeza	Not recommended	Not recommended	Feb 15–Mar 15 E <sup>1/3</sup>	Feb 10–Mar 10
Cool Season Grasses				
Fall	Aug 10–Sept 10	Aug 15–Sept 15	Aug 20–Sept 20	Aug 25–Oct 1
Winter	Not recommended	Not recommended	Not recommended	Not recommended
Spring <sup>1</sup>	Mar 1–Apr 1	Feb 15–Mar 15	Feb 15–Mar 15	Feb 15–Mar 15
Warm Season				
Native Grasses	Mar 15–May 15	Mar 15–May 15	Mar 15–Apr 30	Mar 1–Apr 30
Sunflower	May 7–June 20	May 15–July 1 S <sup>1/2</sup> May 15–July 10 N <sup>1/2</sup>	May 10–July 10 W <sup>1/2</sup> June 10–July 10 E <sup>1/2</sup>	June 10–July 15

<sup>1</sup>Not recommended, but if planted these are best times.



## Planting Rates

As one moves from west to east within each area, planting rates for the various crops increase (**Table 2**). For example, the seeding rate for wheat in western Kansas ranges from 40 to 60 pounds per acre, and increases from 50 to 60 pounds per acre and 60 to 75 pounds per acre in central and eastern areas, respectively. These differences are due to increased rainfall from west to east.

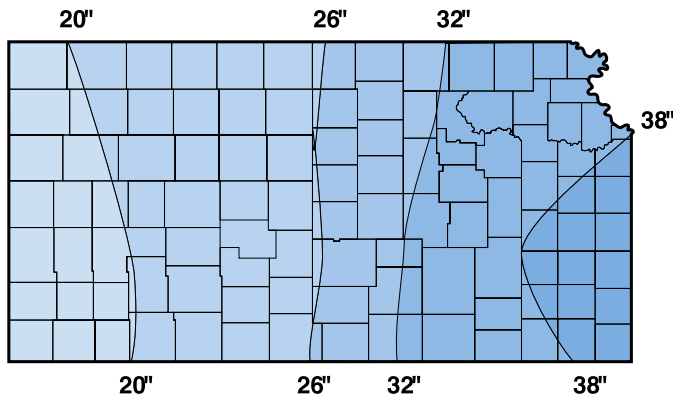
**Table 2. Suggested planting rates for Kansas crops.**

Crop	Rainfall			Irrigated
	Western 20" or less	Central 20–30"	Eastern 30" or more	
	(pounds per acre)			
Wheat	40–60	50–60	60–75	60–90
Triticale	45–60	60–75	75–90	60–90
Winter barley	40–50	60–96	72–96	75–96
Spring barley	60–96	60–96	72–96	75–96
Spring wheat	75–100	90–120	90–120	90–120
Winter oats	–	–	64	–
Spring oats	48–64	48–64	64–96	64–96
Sudangrass–drill	10–15	12–20	20–30	30
Hybrid pearl millets–rows	10	10	10	10
–drill	5–15	10–20	10–20	10–20
Alfalfa	8–10	10–15	10–15	10–20
Sweet clover	8–10	10–15	10–15	10–15
Red clover	–	–	8–10	–
Lespedeza	–	–	20–30	–
Cool Season Grasses				
Smooth brome (pure live seed)	–	10–15	10–15	10–15
Tall fescue	–	–	15–20	–
Tall wheatgrass <sup>4</sup>	10	10	10	NR <sup>2</sup>
Native grasses (pure live seed)				
Native mixtures	5	5	6	NR
Pure stand of:				
Big bluestem	NR	8	8	NR <sup>3</sup>
Indiangrass	NR	8	8	NR
Switchgrass	4	4	4	NR
Sideoats grama	8	8	8	NR
Sand lovegrass	2	2	2	NR
Western wheatgrass	10	10	10	NR
	(seeds per acre)			
Sunflower				
Oilseed	16,000–20,000	17,000–24,000	17,000–24,000	22,000–26,000
Confectionery	12,000–16,000	14,000–18,000	16,000–20,000	15,000–20,000

<sup>2</sup>Not recommended for irrigated production

<sup>3</sup>Individual species not recommended for irrigated pure stand production. Mixtures of 2 or more species recommended.

<sup>4</sup>Mainly for wet and/or saline sites.



## Grain Sorghum Plant and Seed Spacings

The recommended plant population and seed spacing for grain sorghum is dependent on rainfall (Table 3). A dryland grain sorghum producer who farms in the 20- to 26-inch rainfall zone uses a lower plant population than producers in higher rainfall zones or producers using irrigation. Thus the plants per square foot or plants within a foot of row will be fewer and the spacing between seeds will be greater in the lower rainfall areas.

**Table 3. Plant and seed spacings of grain sorghum.**

Recommended population and spacing	Average annual rainfall				Irrigated
	Less than 20"	20–26"	26–32"	More than 32"	
Plant population plants/acre <sup>5</sup>	24,000	35,000	45,000	70,000	100,000
Plant population plants/ft <sup>2</sup>	0.6	0.8	1.0	1.6	2.3
Within row seed spacing at planting <sup>6</sup>	Inches between seeds				
10-inch rows	16.5	12	9.0	6	4.5
20-inch rows	8.5	6	4.5	3	2
30-inch rows	5.5	4	3.0	2	1.5

<sup>5</sup>Plant populations may be increased or decreased by at least 25 percent from the values given depending upon the expected growing conditions without significantly affecting yields.

<sup>6</sup>Assuming 65 percent field emergence. Calibration of plants should be based on seed spacing. Seeding rates based on lbs/A have little meaning since seed size commonly varies from 13,000 to 24,000 seeds/pound.

## Soybean Planting Rates

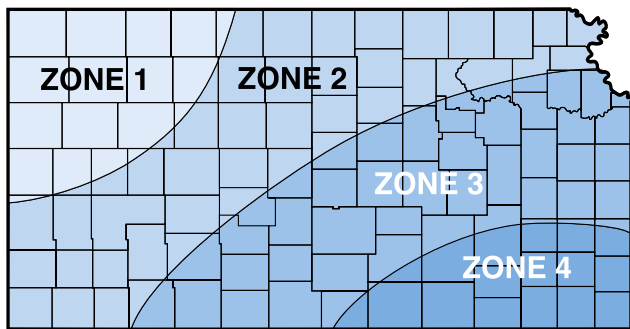
The suggested soybean planting rates and final stands for different row spacings are provided in Table 4. If a producer wants to keep the population the same while decreasing row spacing, it is necessary to reduce the number of seeds or plants per foot of row. For soybeans planted on

droughty soils in central and eastern Kansas or on dryland conditions in western Kansas, the plant population may be reduced by 25 percent. Also, the population may be adjusted upward slightly for late plantings to encourage rapid closing of the rows.

**Table 4. Suggested statewide soybean planting rates.**

Row width inches	Seeds/linear foot	Plants/linear foot <sup>7</sup>
30	10.0	8.0
20	6.6	5.3
10	3.3	2.7

<sup>7</sup>Assuming 90 percent germination and 80 percent emergence.



## Corn Planting Dates, Populations and Seed Spacings

The suggested planting dates for corn range from late March to May 1 in southeastern Kansas (Zone 4), to April 25 to May 20 in Zone 1 (Table 5). As with the other crops, the suggested final corn populations are lower in western areas and increase as one moves eastward (Table 6). Corn planted under limited irrigation systems will have lower plant populations than corn under full irrigation systems. The seed spacings for a range of harvest populations are provided in Table 7.

**Table 5. Suggested corn planting dates.**

**Zone 1:** April 20–May 20  
**Zone 2:** April 15–May 20  
**Zone 3:** April 1–May 10  
**Zone 4:** March 25–April 25

**Table 6. Suggested final corn populations.**

	Plants per acre
Northwest (dryland)	13,000 to 18,000
Northeast	18,000 to 24,000
East central and Southeast (normal planting dates)	16,000 to 20,000
Central	16,000 to 22,000
Early planting with early hybrids	
dryland	18,000 to 24,000
irrigated	28,000 to 36,000
Irrigated	24,000 to 34,000
Limited irrigation	18,000 to 26,000

**Table 7. Seed spacings required for harvest populations of 10,000 to 36,000 plants per acre.**

Harvested population	Seeds/acre <sup>8</sup> planted	Row width		Row width	
		30"	36"	30"	36"
		seed spacing, inches		seeds/10 ft. of row	
10,000	11,800	17.75	14.75	7	8
12,000	14,100	14.75	12.25	8	10
14,000	16,500	12.50	10.50	10	11
16,000	18,800	11.00	9.25	11	13
18,000	21,200	9.75	8.25	12	14
20,000	23,500	9.00	7.50	13	16
22,000	25,900	8.00	6.75	15	18
24,000	28,200	7.50	6.25	16	19
26,000	30,600	6.75	5.75	18	21
28,000	32,900	6.25	5.30	19	23
30,000	35,300	6.00	5.00	20	24
32,000	37,600	5.60	4.60	22	26
34,000	40,000	5.25	4.35	23	28
36,000	42,400	5.00	4.10	24	29

<sup>8</sup>Assuming high germination and that 85 percent of seeds produce plants.

## Wheat Seeds and Seeding Rates per Acre

Wheat producers are aware there are big differences in seed size or the number of seeds per pound among varieties. Planting a large-seed variety at 60 pounds per acre may be equivalent to 50 pounds per acre for a smaller-seed variety. **Table 8** shows the number of wheat seeds per acre at different seeding rates (pounds per acre), as well as thousand kernel

weights and number of seeds per pound. For example, if one variety has 20,600 seeds per pound and another has 11,300 seeds per pound and both are planted at 30 pounds per acre, one can see there is a big difference in the number of seeds per acre (618,000–339,000=279,000).

**Table 8. Number of wheat seeds per acre based on thousand kernel weight or seeds per pound and seeding rates per acre.**

TKW (thousand kernel weight) <sup>9</sup>	Seeds per pound (× 1,000)	Seeding rate (lbs/a)			
		30	40	50	60
		seeds per acre (× 1,000)			
22	20.6	618	824	1,030	1,236
24	18.9	567	756	945	1,134
26	17.4	522	696	870	1,044
28	16.2	486	648	810	972
30	15.2	453	604	755	906
32	14.1	423	564	705	846
34	13.3	399	532	665	798
36	12.6	378	504	630	756
38	11.9	357	476	595	714
40	11.3	339	452	565	678

<sup>9</sup>Grams per 1,000 seeds.

## Wheat Seeds per Foot of Row

In **Table 9**, the desired seeds or plants per foot of row can be determined if the producer knows the number of seeds per pound, drill row width and the seeding rate. For

example, if a producer wants to plant 30 pounds per acre in 7-inch row widths and the seedlot contains 12,000 seeds per pound, the producer finds 4.8 seeds per foot of row.

**Table 9. Number of wheat seeds per foot of row at different seeding rates and row widths of 7, 10, and 12 inches.**

Seeds/lb	Seeding rate (lbs/a)											
	30			40			50			60		
	row width			row width			row width			row width		
	7"	10"	12"	7"	10"	12"	7"	10"	12"	7"	10"	12"
	seeds per foot of row											
12,000	4.8	6.9	8.3	6.4	9.2	11.0	8.0	11.5	13.8	9.6	13.8	16.5
14,000	5.6	8.0	9.6	7.5	10.7	12.9	9.4	13.4	16.1	11.2	16.1	19.3
16,000	6.4	9.2	11.0	8.6	12.2	14.7	10.7	15.3	18.4	12.8	18.4	22.0
18,000	7.2	10.3	12.4	9.6	13.8	16.5	12.0	17.2	20.7	14.5	20.7	24.8
20,000	8.0	11.5	13.8	10.7	15.3	18.4	13.4	19.1	30.0	16.1	22.9	27.5
22,000	8.8	12.6	15.2	11.8	16.8	20.2	14.7	21.0	25.3	17.7	25.2	30.3

## Plants or Seeds per Acre and Seeds per Foot of Row

In Table 10, if a producer counts the number of seeds per foot of row in a given drill row width, the seeding population can be determined. For example, if a producer finds 6 seeds per foot of row in a 7-inch row width, the seeding population is 448,045 seeds per acre.

Two formulas can help producers determine plant populations for any crop. The first formula shows the number of seeds per foot row needed for a desired seeding rate or plant population.

**Table 10. Seeds or plants per acre at various drill row widths and seeds per foot of row.**

Seeds per foot of row	Row width			
	7"	8"	10"	12"
	<b>seeds or plants per acre</b>			
2	149,348	130,680	104,544	87,120
4	298,697	261,360	209,088	174,240
6	448,045	392,040	313,632	261,360
8	597,394	522,720	418,176	348,480
10	746,742	653,400	522,720	435,600
12	896,091	784,080	627,264	522,720
14	1,045,440	914,760	731,808	609,840
16	1,194,788	1,045,440	836,352	696,960
18	1,344,137	1,176,120	940,896	784,080
20	1,493,485	1,306,800	1,045,440	871,200
22	1,642,834	1,437,480	1,149,984	958,320
24	1,792,182	1,568,160	1,254,528	1,045,440

### Formula 1:

$$\frac{\text{desired seeding rate or population}}{43,560 \text{ square feet per acre}} \times \frac{\text{row spacing}}{12 \text{ inches}} = \text{seeds or plants per foot of row}$$

### Example 1:

$$\frac{70,000}{43,560} \times \frac{30 \text{ inches}}{12 \text{ inches}} = 4 \text{ seeds or plants per foot of row}$$

The second formula will show the final seeding rate or plant population when the producer uses a given number of seeds per foot of row.

### Formula 2:

$$\left( \frac{43,560 \text{ square feet per acre}}{\frac{\text{row spacing}}{12 \text{ inches}}} \right) \times \text{seeds or plants per foot of row} = \text{seeding rate or plant population}$$

### Example 2:

$$\left( 43,560 \div \frac{30 \text{ inches}}{12 \text{ inches}} \right) \times 9 \text{ seeds or plants per foot of row} = 156,816 \text{ seeds per acre}$$

## Test Weights and Seeds per Pounds

Producers often want to know the official test weight and the approximate number of seeds per pound for various Kansas crops. This information is provided in **Table 11**. Producers must keep in mind that test weights are subject to

change. The latest information is available from official sources. Also, the number of seeds per pound of a specific crop may range dramatically due to differences in variety and growing conditions.

**Table 11. Official test weights and approximate seeds per pound of various crops.**

Crops	Standard lbs/bu	Approximate seeds/lb
Wheat	60	11,000–20,000
Triticale	50	15,000–20,000
Barley	48	13,000
Oats	32	14,000
Corn	56	1,200
Sorghum	56	15,100
Soybeans	60	2,000–3,500
Sudangrass	40	55,000
Alfalfa	60	220,000
Sweet clover	60	250,000
Red clover	60	260,000
Lespedeza <sup>10</sup> (Korean)	45	240,000
Millet—pearl	60	85,000
proso	56	80,000
foxtail	50	220,000
Sunflower	28	3,000–9,000

<sup>10</sup>Kobe 30 lb/bu  
Korean 45 lb/bu

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