



# Current Report

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## Understanding Seeding Methods and Amounts for Winter Wheat and Canola

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Planting is one of the most critical management aspects in crop production systems. Getting the right amount of seed in the ground is key to ensure good emergence and early-season crop growth. However, determining the amount of seed to plant varies substantially between crops. Furthermore, different methods can be used to determine seeding rates. For most summer row-crops, seeding rates are recommended on a “seeds per acre” basis, while most cereals and winter annuals are planted on a “weight per acre” basis. Part of this difference can be contributed to the equipment traditionally used to plant each of these crops. Summer row-crops are traditionally planted with planters that can singulate seed better than traditional drills, which is how most cereal crops are planted.

Conversations have started in recent years for shifting both winter wheat and winter canola planting from a weight per acre to a seed per acre basis. This is partially due to differences in seed size within individual cultivars among various seed lots. This can result in large differences in the number of seeds planted per acre when planting on a constant weight basis. Additionally, because of expected differences in seed size between cultivars, seed amounts planted on a constant weight basis can vary drastically when changing cultivars.

Realizing the amount of seed being planted is crucial for Oklahoma producers to improve planting practices. For producers interested in shifting seeding rates from a weight per acre to a seeds per acre basis, it is important to understand how these methods differ.

Tables 1 through 4 are provided to show differences in seed amounts for each planting rate using different combinations of seeding rates and seed sizes. Currently, little data in winter wheat and no data in canola exists in the southern Great Plains that suggests one planting method is superior to the other. Therefore, the tables provided do not indicate preference of planting rate determination. Finally, it is important to remember that seed size (i.e., seeds/lb in this case) can vary among cultivars due to genetic potential and can vary among seed lots of the same cultivar, depending on management and environmental factors. Data in Tables 5 and 6 are provided as

examples to demonstrate these differences. The listed cultivars are a small selection of those entered in the official Oklahoma State University cultivar testing programs for winter wheat and winter canola during the 2015 to 2017 growing seasons and do not indicate preference or performance of the cultivars.

**Table 1. Wheat seed number per acre for different seed sizes if planting rate is held as a consistent weight per acre.**

Seeds/lb	Constant seed weight per acre			
	30 lbs	60 lbs	90 lbs	120 lbs
	----- seeds/acre -----			
10,000	300,000	600,000	900,000	1,200,000
10,500	315,000	630,000	945,000	1,260,000
11,000	330,000	660,000	990,000	1,320,000
11,500	345,000	690,000	1,035,000	1,380,000
12,000	360,000	720,000	1,080,000	1,440,000
12,500	375,000	750,000	1,125,000	1,500,000
13,000	390,000	780,000	1,170,000	1,560,000
13,500	405,000	810,000	1,215,000	1,620,000
14,000	420,000	840,000	1,260,000	1,680,000
14,500	435,000	870,000	1,305,000	1,740,000
15,000	450,000	900,000	1,350,000	1,800,000
15,500	465,000	930,000	1,395,000	1,860,000
16,000	480,000	960,000	1,440,000	1,920,000
16,500	495,000	990,000	1,485,000	1,980,000
17,000	510,000	1,020,000	1,530,000	2,040,000
17,500	525,000	1,050,000	1,575,000	2,100,000
18,000	540,000	1,080,000	1,620,000	2,160,000
18,500	555,000	1,110,000	1,665,000	2,220,000
19,000	570,000	1,140,000	1,710,000	2,280,000
19,500	585,000	1,170,000	1,755,000	2,340,000
20,000	600,000	1,200,000	1,800,000	2,400,000

**Table 2. Canola seed number per acre for different seed sizes if planting rate is held as a consistent weight per acre.**

Seeds/lb	Constant seed weight per acre		
	1 lb	3.5 lbs	5 lbs
	----- seeds/acre -----		
50,000	50,000	175,000	250,000
55,000	55,000	192,500	275,000
60,000	60,000	210,000	300,000
65,000	65,000	227,500	325,000
70,000	70,000	245,000	350,000
75,000	75,000	262,500	375,000
80,000	80,000	280,000	400,000
85,000	85,000	297,500	425,000
90,000	90,000	315,000	450,000
95,000	95,000	332,500	475,000
100,000	100,000	350,000	500,000
105,000	105,000	367,500	525,000
110,000	110,000	385,000	550,000
115,000	115,000	402,500	575,000
120,000	120,000	420,000	600,000
125,000	125,000	437,500	625,000
130,000	130,000	455,000	650,000
135,000	135,000	472,500	675,000
140,000	140,000	490,000	700,000
145,000	145,000	507,500	725,000
150,000	150,000	525,000	750,000

**Table 3. Wheat seed pounds per acre for different seed sizes if planting rate is held as a consistent seeds per acre.**

Seeds/lb	Constant seed number per acre			
	500,000 seeds	1,000,000 seeds	1,500,000 seeds	2,000,000 seeds
	----- lb/acre -----			
10,000	50	100	150	200
10,500	48	95	143	190
11,000	45	91	136	182
11,500	43	87	130	174
12,000	42	83	125	167
12,500	40	80	120	160
13,000	38	77	115	154
13,500	37	74	111	148
14,000	36	71	107	143
14,500	34	69	103	138
15,000	33	67	100	133
15,500	32	65	97	129
16,000	31	63	94	125
16,500	30	61	91	121
17,000	29	59	88	118
17,500	29	57	86	114
18,000	28	56	83	111
18,500	27	54	81	108
19,000	26	53	79	105
19,500	26	51	77	103
20,000	25	50	75	100

**Table 4. Canola seed pounds per acre for different seed sizes if planting rate is held as a consistent seeds per acre.**

Seeds/lb	Constant seed number per acre		
	150,000 seeds	250,000 seeds	350,000 seeds
----- lb/acre -----			
50,000	3.0	5.0	7.0
55,000	2.7	4.5	6.4
60,000	2.5	4.2	5.8
65,000	2.3	3.8	5.4
70,000	2.1	3.6	5.0
75,000	2.0	3.3	4.7
80,000	1.9	3.1	4.4
85,000	1.8	2.9	4.1
90,000	1.7	2.8	3.9
95,000	1.6	2.6	3.7
100,000	1.5	2.5	3.5
105,000	1.4	2.4	3.3
110,000	1.4	2.3	3.2
115,000	1.3	2.2	3.0
120,000	1.3	2.1	2.9
125,000	1.2	2.0	2.8
130,000	1.2	1.9	2.7
135,000	1.1	1.9	2.6
140,000	1.1	1.8	2.5
145,000	1.0	1.7	2.4
150,000	1.0	1.7	2.3

**Table 5. Example of differences in wheat and canola seeds per pound among cultivars and years, 2014-2016.**

Crop	Cultivar/Hybrid	Year		
		2016	2015	2014
----- seeds/lb -----				
Wheat†	Bentley	14,942	13,985	13,526
	Doublestop CL+	11,297	13,309	14,375
	Duster	14,170	25,107	18,822
	Endurance	12,462	14,756	14,831
	Gallagher	12,496	16,761	17,050
	Iba	14,083	19,949	14,699
	Ruby Lee	15,385	15,009	14,036
Canola	DKW 44-10	130,227	133,138	117,541
	DKW 46-15	97,845	106,740	---
	HyClass 115	115,427	105,581	129,420
	Pioneer 46W94	98,784	85,714	81,264
	Wichita	---	109,486	124,848
	Mercedes	103,151	56,421	---

† Data provided by the Oklahoma Crop Improvement Association.

**Table 6. Example of differences in wheat seeds per pound among three different lots of cultivars Bentley, Doublestop CL +, and Gallagher produced in 2016.**

Cultivar	Lot		
	1	2	3
----- seeds/lb -----			
Bentley	13,680	13,708	13,191
Doublestop CL +	11,403	11,036	11,345
Gallagher	12,151	12,315	13,023

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Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President for Agricultural Programs and has been prepared and distributed at a cost of 20 cents per copy. 0117 GH.