Estimating Wheat Yield Potential

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In times of crisis or disaster, farmers want to estimate potential yield of wheat well before harvest. Wheat yield is a function of three yield components: heads per square foot, seeds per head and seed size. By careful evaluation of several small, representative samples, credible estimates may be made of yield potential of a wheat field. The closer the wheat crop in question is to maturity, the more likely the estimate will coincide with actual yield potential.

The basis of these estimates are from counts of tiller and seed numbers per square foot. Counts should be made from a measured length of wheat drill row, unless wheat is broadcast planted. To determine the length of drill row, measure the interval between drill rows in inches. Divide this row interval into 12 to get linear feet of row to equal one square foot of land area. The quality of an estimate is only as good as is the data entered to derive it. Be sure to use a uniform area of a field to determine an estimate. In hilly or uneven fields, more samples will be required to get a representative yield estimate.

In Texas wheat fields, it is not uncommon to find head counts ranging from 5 to 100 per square foot at harvest time. Seed per head frequently varies from 15 to 60 per head, and seed size may vary from 11,000 to 18,000 per pound.

During the early vegetative growth stage, yield can only be estimated from estimates of viable tillers per square foot, with assumptions made about seed size and seeds per head. After the head is formed, better estimates can be made by plugging in estimates of seeds per head.

Seed size varies greatly with available moisture, plant disease and variety. When growing a variety known to have small seed size, use a number greater than the 16,000 seed/pound in the examples below. In exceptionally dry weather alter seed size estimate down, while under optimum conditions, assume larger seed.

Example models 1, 2, and 3 below estimate yields at 15, 20, and 40 seed per pound. These examples give a constant seed size of 16,000 per head. Example 4 estimates yield at 20 seed per head with a seed size of 18,000 per pound.

Estimated Yield (bushels per acre)

(No. of heads per sq. ft. x 43560 x [No. of seed per head / No. of seeds per lb.]) / 60

or

No. of heads per sq. ft. x (No. of seed per head / No. of seeds per lb.) x 726

Example 1: assume 15 seeds per head and seed size of 16,000 seeds per lb. (Table 1).

Yield = ? heads per sq. ft. x [(15 / 16,000) x 726]

Yield = ? heads per sq. ft. x 0.68

Example 2: assume 20 seeds per head and 16,000 seeds per lb. (Table 2).

Yield = ? heads per sq. ft. x [(20 / 16,000) x 726]

Yield = ? heads per sq. ft. x 0.91

***Example 3*:** assume 40 seeds per head and 16,000 seeds per lb.

Yield = ? heads per sq. ft. x [(40 / 16,000) x 726]

Yield = ? heads per sq. ft. x 1.82

Example 4: assume 20 seed/head and 18,000 seed/lb (Table 3).

Yield = ? heads per sq. ft. x [(20 / 18,000) x 726]

Yield = ? heads per sq. ft. x 0.81

NOTE: Deciding which tillers are to be counted poses a problem. In late planted wheat, count only tillers with three or more viable leaves as wheat breaks dormancy. At jointing, count only tillers with five leaves or more. Table 1, Table 2, and Table 3 give quick charts for estimating yield from viable tillers per one foot of drill row based upon four drill row intervals.

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Table 1. Estimating wheat yield based upon number of viable tillers per foot of drill row - 15 seed per head, 16,000 seed/lb.

Stem (tillers) per ft. of row	Drill Row Spacing (in.) 6	8	10	12
	Yield Potential (bu/acre)			
1	2	1	1	1
2	3	2	2	2
3	4	4	3	2
4	5	4	4	3
5	7	5	4	4
6	8	6	5	4
7	10	7	6	4
8	11	8	6	5
9	12	10	7	6
10	14	11	8	7
11	15	11	9	8
12	17	12	10	8
13	18	13	11	9
14	19	14	11	10
15	20	16	12	11
16	22	17	13	11
17	24	18	14	11
18	25	18	15	12
19	26	19	16	13
20	27	20	17	14
21	29	22	18	14
22	30	23	18	15
23	32	24	19	16
24	32	25	19	17
25	34	25	20	18
26	36	26	21	18
27	37	28	22	18
28	39	29	23	19
29	39	30	24	20
30	41	31	25	20
31	42	32	25	21
32	44	32	26	22
33	46	34	27	23
34	46	35	28	24
35	48	36	29	24

Table 2. Estimating wheat yield based upon number of viable tillers per foot of drill row - 20 seed per head, 16,000 seed/lb.

Stem (tillers) per ft. of row	Drill Row Spacing (in.) 6	8	10	12
	Yield Potential (bu/acre)			
1	2	2	1	1
2	4	3	3	2
3	5	4	4	3
4	7	5	4	4
5	9	7	5	4
6	11	8	7	5
7	13	10	8	6
8	15	11	9	7
9	17	12	10	8
10	18	14	11	9
11	20	15	12	10
12	22	17	13	11
13	24	18	14	12
14	25	19	16	13
15	27	21	17	14
16	29	22	18	15
17	31	24	18	16
18	32	25	20	17
19	35	26	21	18
20	37	28	22	18
21	39	29	23	19
22	40	31	25	20
23	42	32	25	21
24	44	33	26	22
25	46	34	27	23
26	47	36	29	24
27	49	38	30	25
28	51	39	31	25
29	53	40	32	26
30	54	41	33	27
31	56	43	34	28
32	59	44	35	29
33	60	46	36	30
34	62	47	38	31
35	64	48	39	32

Table 3. Estimating wheat yield based upon number of viable tillers per foot of drill row - 20 seed per head, 18,000 seed/lb.

Stem (tillers) per ft. of row	Drill Row Spacing (in.) 6	8	10	12
	Yield Potential (bu/acre)			
1	2	1	1	1
2	3	2	2	2
3	5	4	3	2
4	6	5	4	3
5	8	6	5	4
6	10	7	6	5
7	11	9	7	6
8	13	10	8	7
9	15	11	9	7
10	16	12	10	8
11	18	13	11	9
12	19	15	12	10
13	21	16	13	11
14	23	17	14	11
15	24	18	15	12
16	26	19	16	13
17	28	21	17	14
18	29	22	18	15
19	31	23	18	15
20	32	24	19	16
21	34	26	20	17
22	36	27	21	18
23	37	28	22	19
24	39	29	23	19
25	41	30	24	20
26	42	32	25	21
27	44	33	26	22
28	45	34	27	23
29	47	35	28	23
30	49	36	29	24
31	50	38	30	25
32	52	39	31	26
33	53	40	32	27
34	55	41	33	28
35	57	43	34	28

Additional information and publications can be found on the Web at:
http://taexsoilcrop.tamu.edu

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