

WHEAT VARIETAL DIFFERENCES IN SEED SIZE

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Introduction:

The goal of maximizing wheat production profitability is typically associated with utilizing high yielding varieties with good test weight and disease resistance under recommended management practices. Seed Cost as it relates to seed size is another component affecting profitability.

Wheat seed can readily differ in size by as much as 100% depending on the variety (genetics) and the production environment. In table 1, the seed size conversion chart shows that at a planting rate of 35 seeds/ft², planting a seed lot with 10,000 seeds/lb would require 33% more seed than a lot with 15,000 seeds/lb. With this scenario, the lot with 10,000 seeds/lb would require three vs. two 50-lb bags of seed/A increasing seed cost by ~ \$15-20/A.

Seed size is important for setting optimal seeding rates and controlling seed cost. Seed size should be considered a secondary characteristic in terms of variety selection. Selecting varieties with good yield, test weight, and disease resistance potential are of primary importance for maximizing profit potential, but seed size, though also affected by production environment and likely unknown at the time of seed ordering is a factor affecting production profitability. The objective of the test was to determine seed size differences among 71 entries from a relatively uniform (single location) production environment.

Methods:

In 2007, 71 wheat entries were evaluated for differences in seed size from a single location test. The test was planted on 10/30/06 in Lexington, KY and harvested 6/18/07. Test was conducted using conventional tillage in a randomized complete block design with four replications.

Seed size was determined by measuring 1000 kernel weights of cleaned, unscreened seed from the variety test's grain yield samples. Data presented are the average values from four replicated plots/entry. Additionally, seed size of entries submitted for testing by seed companies/breeders was determined prior to planting.

Results and Discussion:

Differences in seed size among entries tested ranged from ~ 12,600 to 18,900 with an average of 15,772 seeds per pound (Table 2) These results are from a single test under relatively uniform environmental conditions and illustrate what are primarily genetic differences, though factors such as maturity x environment interaction and disease presence/reaction may also affect weight per seed.

Differences in seed size among entries submitted for testing by seed companies (data not shown) are the results of genetic differences among entries and environmental factors related to where the seed was produced, additionally many companies screen seed for size uniformity and/or large kernels. Seed submitted for

testing ranged from 9,500 to 17,000 with an average size of 12,900.

Differences in average seed size between the results of this test and the seed samples submitted for testing may be a result of

differences in production environment, but are likely more influenced by screening seed for size/uniformity. Though production environment can affect seed size, the data from this test provides an estimate of genetic differences in seed size among varieties.

TABLE 1. SEED SIZE CONVERSION

Seeds/Lb.	Seeds Per Square Foot			
	30	35	40	45
	Pounds of Seed Per Acre			
9000	145	169	194	218
10000	131	152	174	196
11000	119	139	158	178
12000	109	127	145	163
13000	101	117	134	151
14000	93	109	124	140
15000	87	102	116	131
16000	82	95	109	123
17000	77	90	102	115
18000	73	85	97	109

TABLE 2. SEED SIZE DATA (2007 UK WHEAT VARIETY TEST).

VARIETY	SEEDS/LB	VARIETY	SEEDS/LB
Adler 575	17752	KY 96C-0786-3-2	13565
AgriPro COKER Beretta	16709	KY 97C-0321-02-01	15153
AgriPro COKER Branson	15717	KY 97C-0519-04-07	14438
AgriPro COKER COKER 9511	15011	KY 97C-0546-17-05	14221
AgriPro COKER Cooper	16356	KY 97C-0546-20-05	15211
AgriPro COKER W1377	15791	KY 97C-0574-01-03	12974
Beck 112	15806	KY 97C-0574-01-04	13006
Beck 117	15277	MO 011126	13668
Beck 122	16021	MSU 1007R	14417
Bess	15914	Pembroke	13937
Chesapeake	14150	Pioneer variety 25R54	15439
Clark	15057	Pioneer variety 25R63	14792
Cumberland	16031	Pioneer variety 26R15	16174
Delta Grow 1600	18595	Pioneer variety 26R22	15300
Delta Grow 4100	17081	Pioneer variety 26R87	12648
Delta Grow 4500	15310	SE 0377-4	16014
Delta Grow 5200	17421	SE 4006	15599
Delta King 7710	15172	SS 520	16344
Delta King 9577	17525	SS 560	17911
Delta King XTJ 730	18786	SS 8302	14793
Dixie 900	16027	SS 8309	17531
Dixie 989	18497	SS 8404	14995
Ebberts 501	15086	SS MPV-57	15971
Ebberts 570	16113	Steyer Alma	17641
Ebberts 575	14077	Steyer Fatzinger	16179
EXCEL 173	15189	Steyer Hammon	17063
Exsegen Dinah	15295	Steyer Morral	16722
Exsegen Judith	15600	Truman	17016
Exsegen Leah	18940	USG 3342	14467
Exsegen Lydia	16460	USG 3350	15599
Exsegen Rachel	14349	USG 3910	15308
Jamestown	17978	VA 02W-555	14195
JGL EXP 701	18063	Vigoro V9611	17792
JGL EXP 703	15097	Vigoro V9710	16199
KY 93C-1238-17-1	15343	Vigoro V9712	15928
KY 96C-0769-7-3	14569	AVERAGE	15772
		Max/Min =	
		18940/12648	