

## **Survey of Seeds per Gram of Individual Alfalfa Plants**

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The objective is to report seeds per gram of individual plants in alfalfa populations grown and pollinated under the same conditions. “Seeds per gram” is a measure of seed size, and indicates how much progress has been made in a population developed from parents selected for larger seed size. This report provides reference points for a work in progress.

## **Materials**

Vernal: Released by the Wisconsin Agriculture Experiment Station in 1952. See *Agron. J.* 48:587.

Oneida VR: Released by the Cornell University Agriculture Experiment Station in 1990. See *Crop. Sci.* 30:955.

Hybriforce 420: Developed and distributed by the Dairyland Seed Company. See Dairyland brochures.

WI 643: A double cross hybrid [(S1 × S1) × (S1 × S1)] based on concepts reported in *Crop Sci.* 29:1173-1177, *Crop Sci.* 34:823-829, and selection for seed size.

HN 12.1: Inbred of “Honeye” developed by selfing for 12 generations followed by sibling mating for 3 generations. First selfing generation reported in *Crop Sci.* 29:920-923.

## **Mating**

All plant populations were grown in the greenhouse during the winter under high intensity lights. Each population was placed in an indoor bee chamber twice, each time for one day for bumblebees to pollinate them. Plants were back in the greenhouse for about one week between times in the bee chamber. Only one population was in the chamber at any one time.

## Results and Comments

Data are reported in Tables and Figures that follow. Vernal, Oneida VR, and HB420 were all in the area of 500+ seeds per gram. Parents of WI 643 were developed by recurrent selection for seed size, and WI 643 had the largest seeds, 372 seeds per gram. Inbred HN 12.1 had the smallest seeds, 625 seeds per gram.

Only two of the 43 plants of WI 643 had more than 500 seeds per gram. Grading to recover about 65% of the largest seeds in WI 643 would recover seed from one individual in Vernal, none in Oneida VR, one or two in HB420 and none in HN 12.1.

All populations appeared to have normal to near normal distributions for seeds per gram except Vernal, which had a bimodal tendency for reasons unknown. Selection for seed size will continue at least until seed size is doubled at about 250 seeds per gram.

**Summary Table:** Means for grams of seed, seeds per gram, and frequency of plants producing less than 0.1 grams of seed for five alfalfa populations.

<b>Population</b>	<b>Mean grams of seed<sup>‡</sup></b>	<b>Mean seeds per gram<sup>‡</sup></b>	<b>Frequency of plants with &lt; 0.1 grams of seed (%)</b>
Vernal	1.02	534	0.0
Oneida VR	0.48	523	23.7
HB 420	0.64	501	12.5
WI 643	1.05	372	8.5
HN 12.1	0.58	625	14.0

<sup>‡</sup>Unproductive plants were not included in means.

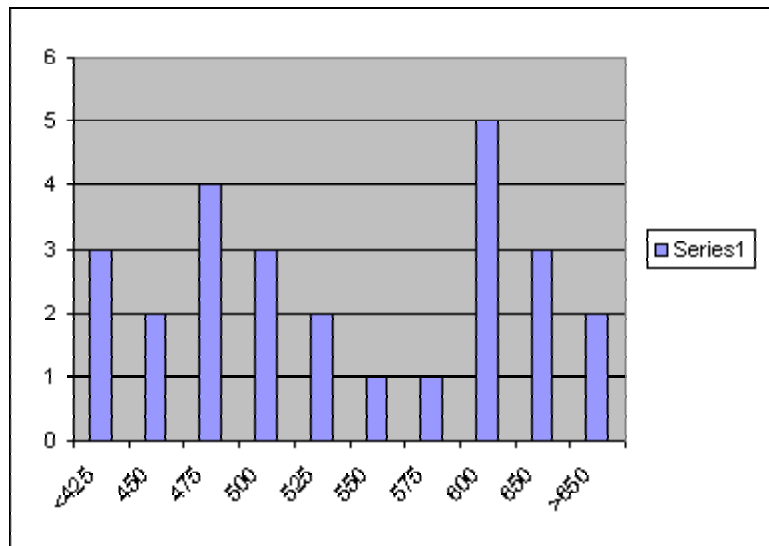
**Vernal**

Seeds	Grams	Seeds/g
489	1.43	342
547	1.36	402
181	0.43	421
865	2.00	433
688	1.56	441
750	1.64	457
539	1.16	465
356	0.76	468
471	1.00	471
638	1.34	476
242	0.50	484
145	0.29	500
183	0.36	508
325	0.63	516
940	1.74	540
386	0.69	559
151	0.26	581
134	0.23	583
654	1.12	584
815	1.39	586
148	0.25	592
752	1.22	616
836	1.34	624
886	1.41	628
898	1.29	696
1048	1.45	723

**MEAN: 1.02 534**  
**STDEV: 0.53 86**  
**MEDIAN: 1.16 516**

0 unproductives (<=0.1grams of seed):  
0.0%

From	To	Count
<425		3
425	450	2
451	475	4
476	500	3
501	525	2
526	550	1
551	575	1
576	600	5
601	650	3
>650		2



**OVR**

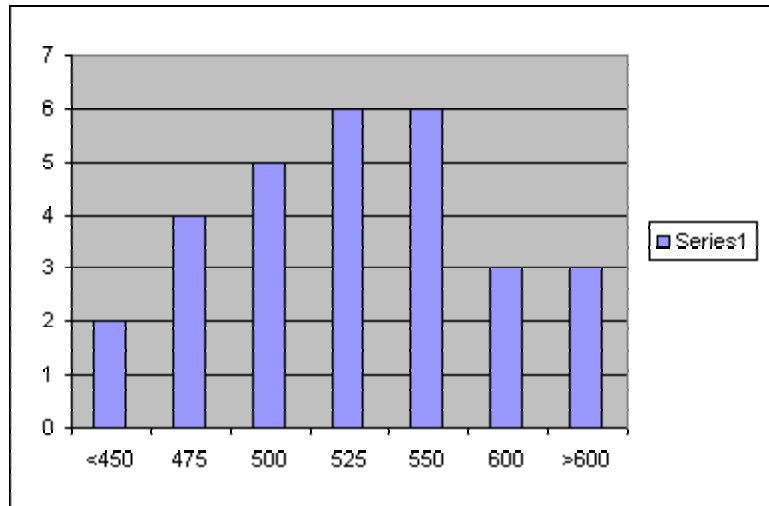
Seeds	Grams	Seeds/g
332	0.81	410
56	0.13	431
166	0.36	461
273	0.59	463
238	0.51	467
320	0.68	471
100	0.21	476
270	0.56	482
600	1.22	492
195	0.39	500
251	0.50	502
704	1.46	482
178	0.35	509
345	0.67	515
297	0.57	521
177	0.34	521
152	0.29	524
158	0.30	527
195	0.37	527
159	0.30	530
86	0.16	538
240	0.44	545
148	0.27	548
240	0.43	558
575	1.02	564
123	0.21	586
204	0.31	658
101	0.15	673
191	0.28	682

**MEAN: 0.48 523**  
**STDEV: 0.32 65**  
**MEDIAN: 0.37 521**

9 unproductives (<=0.1grams of seed):  
 23.7%

	Seeds	Grams
X	60	0.08
X	49	0.06
X	48	0.03
X	25	0.03
X	16	0.02
X	41	0.03
X	67	0.06
X	27	0.02
X	14	0.01

From	To	Count
	<450	2
450	475	4
476	500	5
501	525	6
526	550	6
550	600	3
	>600	3



**HB 420**

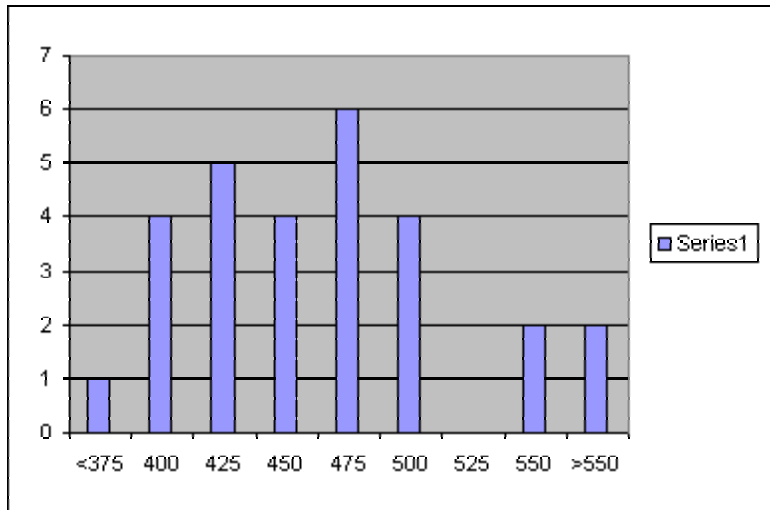
Seeds	Grams	Seeds/g
477	1.35	353
123	0.32	384
235	0.60	392
881	2.22	397
239	0.60	398
886	2.19	405
123	0.30	410
136	0.33	412
224	0.53	423
242	0.57	425
638	1.49	428
588	1.35	436
255	0.57	447
251	0.56	448
127	0.28	454
115	0.25	460
323	0.70	461
354	0.76	466
255	0.54	472
204	0.43	474
205	0.43	477
303	0.63	481
634	1.31	484
107	0.22	486
388	0.73	532
1103	2.06	535
156	0.26	600
239	0.38	629

**MEAN: 0.64 501**  
**STDEV: 0.50 54**  
**MEDIAN: 0.49 479**

4 unproductives (<=0.1 grams of seed):  
 12.5%

	Seeds	Grams
X	36	0.06
X	12	0.01
X	38	0.02
X	47	0.06

	Count	
From	To	
	<375	1
375	400	4
401	425	5
426	450	4
451	475	6
476	500	4
501	525	0
526	550	2
	>550	2



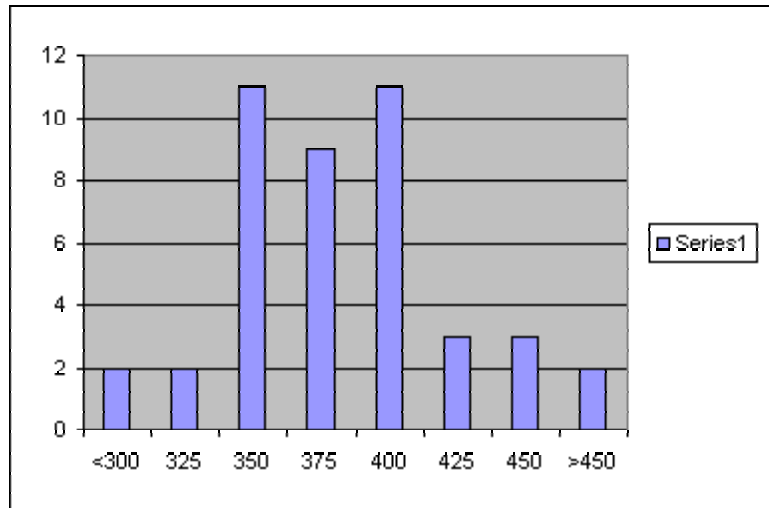
**WI 643**

Seeds	Grams	Seeds/g
43	0.16	269
606	2.03	299
274	0.88	311
117	0.37	316
293	0.90	326
191	0.58	329
610	1.85	330
362	1.09	332
211	0.63	335
320	0.94	340
68	0.20	340
460	1.35	341
468	1.36	344
253	0.73	347
678	1.94	349
249	0.71	351
539	1.53	352
518	1.45	357
568	1.59	357
151	0.42	360
725	2.00	363
556	1.51	368
346	0.94	368
255	0.69	370
289	0.77	375
271	0.72	376
530	1.41	376
151	0.40	378
957	2.52	380
145	0.38	382
100	0.26	385
841	2.17	388
580	1.49	389
569	1.45	392
287	0.73	393
49	0.12	408
63	0.15	420
788	1.87	421
580	1.31	443
208	0.47	443
117	0.26	450
1312	2.55	515
121	0.22	550

4 unproductives (<=0.1grams of seed):  
8.5%

	Seeds	Grams
X	6	0.02
X	2	0.01
X	8	0.01
X	38	0.06

	Count	
From	To	
	<300	2
300	325	2
326	350	11
351	375	9
376	400	11
401	425	3
426	450	3
	>450	2



**MEAN: 1.05 372**  
**STDEV: 0.68 52**  
**MEDIAN: 0.90 368**

**HN 12.1**

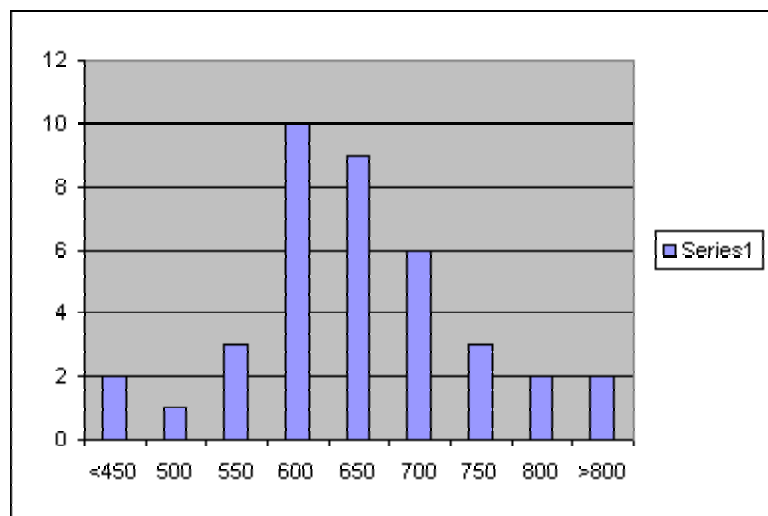
Seeds	Grams	Seeds/g
260	0.63	413
47	0.11	427
90	0.18	500
505	0.98	515
406	0.77	527
465	0.87	534
510	0.92	554
402	0.72	558
173	0.31	558
196	0.34	576
548	0.95	577
272	0.47	579
525	0.90	583
580	0.99	586
412	0.70	589
160	0.27	593
238	0.39	610
545	0.89	612
383	0.62	618
445	0.72	618

6 unproductives (<=0.1 grams of seed):  
14.0%

	Seeds	Grams
X	34	0.01
X	76	0.08
X	38	0.02
X	7	0.01
X	7	0.01
X	46	0.10

	Count	
From	To	
	<450	2
450	500	1
501	550	3
551	600	10
601	650	9
651	700	6
701	750	3
751	800	2
	>800	2

875	1.41	621
202	0.32	631
330	0.52	635
345	0.54	639
142	0.22	645
712	1.09	653
275	0.41	671
362	0.53	683
295	0.43	686
165	0.24	688
210	0.30	700
775	1.07	724
275	0.38	724
220	0.30	733
430	0.57	754
322	0.42	767
229	0.28	818
275	0.33	833



**MEAN: 0.58 625**  
**STDEV: 0.31 94**  
**MEDIAN: 0.53 618**