Report to the Oregon Processed Vegetable Commission
1999–2000

1. Title: Green Bean Breeding

2. Project Leaders: James R. Myers, Horticulture
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Cooperator: David Mok

3. Project Status: Terminating 30 June, 2000

4. Project Funding: $48,186 breeding
$7,993 processing
$56,179 total

Breeding funds were used for a major portion of the support of a vegetable breeding technician, student labor, supplies, and research farm expenses. A plot thresher was also purchased. Processing funds were used for processing samples of experimental beans, laboratory analysis, and for student labor.

5. Objectives:

i. Breed Bush Blue Lake green bean varieties with high economic yield.

ii. Improve pod characteristics including straightness, color, smoothness, texture, flavor and quality retention, and combine with delayed seed size development.

iii. Incorporate white mold resistance, and improve root rot tolerance while maintaining resistance to bean common mosaic virus.

iv. Initiate populations to facilitate molecular marker assisted selection of desirable horticultural traits.

v. Evaluate novel genetic traits of potential benefit.

6. Report of Progress:

Bean breeding lines and commercial varieties were tested in replicated trials planted 22 April, 24 May, 1 June, and 14 June. The advanced trials planted 22 April and 24 May consisted of three check varieties and seven advanced lines planted in two row plots replicated six times. The 1 June trial was a preliminary trial, and consisted of one row per entry replicated six times. This trial had four check varieties and 21 experimental lines. The 14 June trial consisted of five check varieties (two full sieve green beans, one small sieve green bean, one wax bean and one Romano bean), six OSU lines, and 13

commercial entries (two wax beans and two Romanos). A preliminary trial was planted in early May, but was abandoned because of severe Dual injury from fall application of the herbicide to control yellow nutsedge. An additional advanced trial was planted in late June because of concerns with stand problems in the second advanced trial. However, we decided to proceed with evaluation of the second advanced trial. Therefore, the last advanced trial was not harvested because we already had data from two advanced trials in 1999.

For all trials, five-foot sections of row were handpicked on each harvest date in each of four replications. In most cases, three harvests on alternate days were made to obtain a range of maturity. Replications were combined for grading.

Samples were canned and frozen at Food Science and Technology for evaluation by industry representatives in February. Processed quality data will be published in a separate report.

Data from replicated trials are summarized in Tables 1-10 and Figures 1-11. The season began rather cold and rainy, which resulted in a long maturation period (about 90 days) and lack of concentrated set in the first trial. The growing season in general was very mild with little evidence of split sets due to high temperatures.

For full sieve advanced lines overall, Oregon 54 had higher $/A than Oregon 91G (see summary table below, tables 1-4, 6), but not significantly so. Among the experimental lines, OSU 5651 continued to have the highest $/A values followed by OSU 5635. Both lines were significantly higher than Oregon 91G and OSU 5630. Although not significantly different than Oregon 91G, OSU 5630 had lower $/A values for trial averages, and selected harvests. In general, OSU 5630 and OSU 5669 show greatest similarity to Oregon 91G for field performance. OSU 5630 has pod color similar to Oregon 91G, but pods are smoother and straighter. OSU 5669 has significantly better pod color as well as straighter and smoother pods. OSU 5416, OSU 5635, and OSU 5651 are most similar to Oregon 54 with straighter and smoother pods. In 1998, OSU 5630 and OSU 5651 showed the greatest heat tolerance, while OSU 5635 was worst, although these results may be compounded with maturity.

Season average $/A based on			
Line	Trial averages[z]	Selected harvests[y]	Highest harvests
Oregon 91G	1825	1886	1993
Oregon 54	2003	2094	2166
OSU 5416	1911	1862	2050
OSU 5630	1765	1802	1876
OSU 5635	2075	2062	2251
OSU 5651	2144	2106	2345
OSU 5669	1916	1838	2047
LSD @5%	223	271	221

[z]Average of 2-6 harvests from 4 trials, based on weight of graded beans.

[y]The harvest selected as best for comparison and used for analysis of variance at 50% 1-4 sieve in tables 5, 6 and 10.

Four year averages for yield and $/A values are shown below for full sieve advanced lines and checks. For the overall average, only OSU 5651 was significantly higher than Oregon 91G and OSU 5630. Trends in the data generally suggest the following order: OSU 5651>Oregon 54=OSU 5416=OSU 5635>Oregon 91G=OSU 5630=OSU 5669. OSU 5635 appears to have yield stability in that it performed consistently in most years, whereas other high yielding cultivars varied from year.

Four year average for full sieve beans[z]

	Year					
Line	1996	1997	1998	1999	Overall Average	Average of 1998 & 1999
Adjusted T/A						
Oregon 91G	9.1	9.4	8.3	11.5	9.6	9.9
Oregon 54	10.4	9.4	8.5	13.2	10.4	10.9
OSU 5416	10.3	9.8	8.9	11.6	10.1	10.2
OSU 5630	9.0	10.2	8.3	11.2	9.7	9.8
OSU 5635	9.4	10.0	9.4	12.6	10.4	11.0
OSU 5651	9.2	10.4	10.1	13.1	10.7	11.6
OSU 5669			8.9	12.2		10.6
LSD @5%					0.9	1.1
$/A						
Oregon 91G	1440	1589	1450	1989	1617	1720
Oregon 54	1651	1622	1489	2277	1760	1883
OSU 5416	1627	1656	1560	1990	1708	1775
OSU 5630	1427	1699	1464	1914	1626	1689
OSU 5635	1485	1651	1646	2172	1739	1909
OSU 5651	1644	1754	1777	2228	1851	2003
OSU 5669			1580	2084		1832
LSD @5%					161	212

[z]Average of 5, 5, 5 and 4 trials in 1996, 1997, 1998 and 1999 respectively. Based on field yields of 2-6 sieve beans.

Other standard sieve lines: One preliminary trial was grown this year with four standard sieve lines included in addition to the advanced lines (tables 3-6). OSU 5641 and OSU 5643 have been tested for two years now. Both had higher yields than Oregon 91G, and OSU 5641 out yielded Oregon 54 when adjusted to 50% 1-4 sieve. In the field, OSU 5641 showed greater lodging, probably associated with higher yield. Pod quality of OSU 5641 was not as good as OSU 5643, but was comparable to Oregon 91G. Last year, OSU 5643 had the best performance of the group. OSU 5641 and OSU 5643 tend to become seedy at 50% 1-4 sieve, and may be best handled as an intermediate sieve bean. OSU 5698 has been grown for several years. It is similar to Oregon 91G in yielding ability, but has better pod quality. It also had better heat tolerance than most lines in 1998. A decision on whether to keep this line should be made after frozen and canned product

evaluation. OSU 5709 was grown for the first time this year. It had a very concentrated set, very smooth pods with color slightly lighter than Oregon 91G. It was also significantly lower yielding than all other entries. Because pod characters are not significantly better than the checks, this entry will not be grown next year.

Small Sieve Beans: Trials were concentrated on comparing OSU 5613 to Medinah and Minuette this year (tables 7 & 8). Based on season averages, OSU 5613 had higher $/A value than either Medinah or Minuette, although the difference was not statistically significant (table below). Based on a five year average, OSU 5613 had higher yield and $/A value than Minuette. The difference was statistically significant for yield but not for $/A. OSU 5613 seems to perform particularly well during the cool and wet conditions typical of early spring plantings as can be seen in tables 7 and 8. In later-season trials, Medinah and Minuette sometimes have higher yields and $/A values.

Season Average $/A based on			
Line	Trial Averages	Selected Harvests[y]	Highest Harvests
OSU 5613	1811	2105	2105
Medinah	1837	2038	2052
Minuette	1553	1726	1935
LSD @5%	NS	NS	NS
[z]Average of 2-5 harvests from 4 trials, based on weight of graded beans.			
[y]The harvest selected as best for comparison and used for analysis of variance in tables 8 and 10.			

Five year average for small sieve beans						
	Year[z]					Overall
Line	1995	1996	1997	1998	1999	Average
T/A						
OSU 5613	6.3	5.0	8.5	6.6	7.9	6.9
Minuette	6.0	4.6	8.3	6.5	7.8	6.6
LSD @ 5%						0.2
$/A						
OSU 5613	1179	1152	2052	1691	2304	1676
Minuette	1245	1086	1987	1649	2118	1617
LSD @ 5%						NS
[z]Average of 2, 5, 4, 5 and 4 trials in 1995, 1996, 1997, 1998 and 1999 respectively.						

OSU 5747, OSU 5803, and OSU 5804 were tested in 1998 and 1999 (see table below). The three lines produce mostly 3 and 4 sieve beans at optimum harvest. In comparison with OSU 5613, OSU 5747 was lower yielding. It also had very smooth, long, but lighter colored pods, and is probably not worth further testing. It should be crossed to OSU 5446 derived lines to improve pod length. OSU 5803 and OSU 5804 had yields and $/A values that were comparable or superior to OSU 5613. OSU 5804 in particular has had consistently high yields. These lines are sisters, and were derived from the cross OSU 5446 X Oregon 91G. In comparisons with OSU 5446 and other checks, they generally

had longer pods than OSU 5446 with OSU 5804 having longer pods than OSU 5803. Pod color was equal to or better than Oregon 91G. OSU 5803 had round pods while OSU 5804 had slightly oval pods. Both lines have potential to fill the niche of a 4-sieve bush blue lake type. OSU 5804 at least should be retained for further testing.

Two year average for small sieve beans[z]

	T/A			$/A		
Line	1998	1999	Average	1998	1999	Average
OSU 5613	6.3	7.0	6.7	1610	1819	1715
OSU 5747	6.3	5.7	6.0	1574	1429	1502
OSU 5803	6.3	7.5	6.9	1546	1891	1719
OSU 5804	7.9	7.8	7.9	1914	2174	2044
LSD @ 5%			NS			NS

[z]Based on 2 trials in 1998 and 1 trial in 1999. Yields are field yields of 2-6 sieve beans.

Small sieve beans tested for the first time this year included OSU 5723, OSU 5842, OSU 5844 and OSU 5860. OSU 5723 had a significant percentage of 5-sieve pods, although most pods were in the 4-sieve class at optimum harvest. Pods were very dark green, straight and smooth. The line was late and had a split set, but still managed yields comparable to Minuette and Medinah (table 8). OSU 5842 and OSU 5844 are sister lines with high yields and $/A values. Both are OSU 5446 type with significantly longer and straighter pods. Color of OSU 5842 is comparable to OSU 5446 whereas that of OSU 5844 may be lighter. Both should be tested again next year. OSU 5860 is another 4-sieve type. Yields were low in this trial and pod quality was marginal, although optimum harvest may have been missed. A decision concerning retention of this line in the program should be made after processed product evaluation.

Commercial Bean Trial: This trial had lush growth leading to indeterminancy and white mold infection. In addition, bean lines became seedy without pods fully sizing. In general, OSU lines had higher yields than other green bean lines. Some of the commercial lines, particularly 4-sieve lines, had high $/A value. Both SB 4218 and SB 4248 had color as good as or better than 91G. Other green bean lines tended to be too light. Among the wax beans, both experimental lines had better color in small sieve sizes than Indy Gold. Klondyke is apparently a standard sieve size bean, but 5-sieve size pods were seedy, and no 6-sieve pods were produced. It was the highest yielding of the wax beans. Among small sieve size beans, Proton produced exceptionally high yields for a 2-sieve bean. Among Romano bean lines, Tapia had yields that equaled Roma II where as Oja had significantly higher yields. Tapia had better color and maturity uniformity than Roma II while Oja was later and less uniform in maturity.

Root rot and white mold trials: A root rot trial containing 90 checks and breeding lines was grown in two replicates and evaluated (table 11). Overall, disease incidence did not seem as severe this season, because most OSU breeding lines and checks had low to moderate disease incidence. Medinah was severely stunted in this trial (as was Minuette) and receive a root score of 4.5 and 5. Seventy breeding and germplasm lines were grown

in a white mold nursery. Growth in the field was lush and disease incidence was extremely severe (for example, Oregon 54 had a score of 9 on a 1 - 10 scale). The best Oregon blue lake line is B7354-6-2-1 with an average score of 2.5. This a low yielding flat-podded line, but may be a source of useful resistance when crossed into a better blue lake type.

Development and evaluation of new materials: Selection continues in the Oregon blue lake X Minuette crosses to obtain lines with improved architecture. Many selections from these crosses also have extremely dark green pods. This material is now in the F_5 generation and approaching homozygosity. Other crosses have been made for white mold resistance, additional sources of improved architecture and general population improvement within the blue lake background.

Molecular Marker Laboratory: Recombinant inbred lines developed by single seed descent from crosses between OSU varieties and lines Maxima or Minuette are now in the F_5 generation. This summer, we evaluated the 200 recombinant inbred lines from the cross OSU 5630 X Minuette and its reciprocal for morphological and horticultural traits. We have begun to map RAPD markers in this population with the objective of developing a linkage map with important traits mapped. RAPD markers have also been used to characterize a diverse group of snap bean lines for characterization of genetic relationships.

Bean seed thresher: A comparison of field emergence of OSU 5635 threshed by hand, and threshed with the Alamco small plot thresher showed that the machine threshed seed had about a 10% reduction in emergence compared to the hand threshed seed (69.5% vs 79.5%) for seed planted during the early season. Such a reduction is acceptable for propagation of breeding lines (and may be considered a selection tool for resistance to mechanical damage), but would not be acceptable for production of seed for nursery plantings. This year, further refinement of adjustment of the thresher has resulted in seeds with less damage.

Small scale processor evaluation: Several lines were grown on small acreages for processing evaluation. OSU 5630 performed well compared to Oregon 91G (see table below) for both yield and $/A. While OSU 5651 had higher yield, $/A was lower than adjacent Oregon 91G. OSU 5651 seemed rather indeterminate in this planting, which may be related to the lower $/A received for this line. OSU 5613 was also grown in an on farm trial, where it produced a yield of 6.5 T/A (gross).

Line	Location	Acres	Gross T/A	Net T/A	$/A
Oregon 91G	1	11.0	10.6	9.5	$1,741
OSU 5630	1	8.0	11.0	9.8	$1,778
Oregon 91G	2	17.4	6.6	6.6	$1,344
OSU 5651	2	0.7	8.3	7.5	$1,319
OSU 5613	3	24.7	6.5	5.7	$1,252

Plans for release: Given the accumulation of positive data, OSU 5613 should be released to the trade this spring. It is less easy to determine if other advanced lines should be released. While OSU 5630 has acceptable performance and better pod quality than Oregon 91G, one seed company has found the line to produce an excessive number of off-types. I am waiting to hear from other seed companies before deciding on release. Other lines lack sufficient on farm testing. OSU 5651 should be tested again in larger acreages, and OSU 5635 and OSU 5669 should be grown on farm.

7. Summary:

Eighteen OSU lines were evaluated in replicated handpicked yield trials planted over the period 22 April to 14 June. Minuette was included as a small sieve check in all trials and Medinah was included in some trials. Sixteen commercial varieties (including standard and small sieve green beans, wax beans, and Romano beans) were also evaluated. Continuing a trend from previous years, OSU 5630 and OSU 5669 had yields similar to or better than Oregon 91G with superior pod quality. OSU 5651 has good pod quality, very high yields, and appears from this year's data to have a more concentrated set than that of Oregon 54. OSU 5635 has yields similar to or slightly less than Oregon 54 and good pod quality. It also appears to have yield stability over environments. Among small sieve lines, OSU 5613 had a superior field performance compared to the checks, particularly in early season plantings. OSU 5613 has pod quality similar to Oregon 91G with yields comparable to Minuette. White mold and root rot trials were continued with the identification of several lines with resistance. Crosses with new white mold resistant lines were made, and populations were advanced in the field. Recombinant inbred populations have been developed and we are beginning to develop a genetic map. Three OSU lines were evaluated on farm in small-scale processor trials.

8. Signatures: Redacted for Privacy

Project Leader _____

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Table 1. Yields of selected OSU green bean lines, April 22 Planting, Corvallis, 1999.[z]

Line	Av. Stand	Days	% 1-4	T/A	Adj. 50%	Adj. 60%	Av. Adj. T/A 50%[y]	Av. Adj. T/A 60%[y]
91G	130	84	79	6.1	7.9	7.1	11.0	10.0
		86	76	7.9	10.0	9.0		
		88	59	11.9	12.9	11.8*		
		90	53	11.9	12.2*	11.2		
		91	45	12.5	11.9	11.0		
OR 54	132	86	90	6.1	8.5	7.6	12.7	11.6
		89	78	9.6	12.2	11.0		
		91	61	13.1	14.5	13.2*		
		93	50	15.8	15.8*	14.4		
		95	39	14.9	13.3	12.3		
		97	31	14.1	12.0	11.2		
5416	127	91	65	9.4	10.8	9.7*	12.0	11.0
		93	54	12.1	12.6*	11.5		
		95	40	14.1	12.7	11.8		
		97	25	15.5	11.6	11.0		
5630	132	84	69	5.8	6.9	6.2	9.3	8.5
		86	57	8.2	8.7	8.0*		
		88	48	9.7	9.5	8.7		
		90	48	10.8	10.6*	9.7		
		91	38	11.6	10.2	9.5		
		97	26	12.7	9.6	9.1		
5635	137	91	61	13.1	14.5	13.2*	14.5	13.4
		93	46	15.2	14.6*	13.5		
		95	41	15.9	14.5	13.4		
5651	124	91	71	12.9	15.6	14.1	14.8	13.6
		93	55	15.3	16.1	14.7*		
		95	49	15.2	15.0*	13.8		
		97	37	14.7	12.8	11.9		
5669	132	86	81	8.2	10.7	9.6	11.4	10.3
		88	67	9.2	10.8	9.8		
		89	66	10.1	11.7	10.6*		
		91	47	12.4	12.0*	11.0		
		92	41	12.8	11.6	10.7		

[z]Mean of 4 replications; subplots of 5' were harvested from double 20' plots on each harvest date; rows 36" apart; days = days from planting; % = percent 1-4 sieve grades; adj. 50% = tons/acre adjusted to 50% 1-4 sieve; adj. 60% = tons/acre adjusted to 60% 1-4 sieve. Analysis of variance (Table 5) was calculated using the harvest marked with *.

[y]Average Adj. T/A is a rough estimate because of non-uniform number of harvests included.

Table 2. Yields of selected OSU green bean lines, May 24 Planting, Corvallis, 1999.[z]

Line	Av. Stand	Days	% 1-4	T/A	Adj. 50%	Adj. 60%	Av. Adj. T/A 50%[y]	Av. Adj. T/A 60%[y]
91G	150	72	66	11.7	13.5	12.3*	12.6	11.7
		73	50	12.5	12.5*	11.5		
		75	39	14.2	12.6	11.7		
		77	30	14.9	11.9	11.1		
OR 54	147	72	85	10.4	14.1	12.6	13.8	12.5
		74	67	12.2	14.3	12.9*		
		77	41	14.2	12.9*	11.9		
		79	38	15.5	13.7	12.7		
5416	149	77	40	14.4	13.0*	12.0*	12.5	11.6
		79	38	13.6	12.0	11.1		
5630	150	70	78	9.4	12.0	10.8	12.1	11.0
		72	69	10.3	12.2	11.0		
		73	65	11.2	12.9	11.7*		
		74	50	11.9	11.9*	10.9		
		77	41	13.6	12.4	11.5		
		79	36	12.7	10.9	10.2		
5635	150	74	70	13.4	16.1	14.6	13.5	12.3
		77	54	12.8	13.3*	12.1*		
		80	44	13.1	12.3	11.4		
		81	43	13.0	12.1	11.1		
5651	149	77	59	13.6	14.8	13.4*	14.0	12.8
		79	54	12.9	13.4*	12.3		
		81	42	15.0	13.8	12.8		
5669	150	72	77	11.1	14.1	12.7	13.2	12.0
		73	64	11.2	12.8	11.6		
		74	66	11.9	13.8	12.5		
		75	55	13.1	13.7	12.5*		
		77	53	13.0	13.4*	12.2		
		79	36	13.1	11.2	10.4		

[z]Mean of 4 replications; subplots of 5' were harvested from double 20' plots on each harvest date; rows 36" apart; days = days from planting; % = percent 1-4 sieve grades; adj. 50% = tons/acre adjusted to 50% 1-4 sieve; adj. 60% = tons/acre adjusted to 60% 1-4 sieve. Analysis of variance (Table 5) was calculated using the harvest marked with *.

[y]Average Adj. T/A is a rough estimate because of non-uniform number of harvests included.

Table 3. Yields of selected OSU green bean lines, June 1 Planting, Corvallis, 1999.[z]

Line	Av. Stand	Days	% 1-4	T/A	Adj. 50%	Adj. 60%	Av. Adj. T/A 50%[y]	Av. Adj. T/A 60%[y]
91G	150	72	57	10.9	11.7	10.7*	10.2	9.4
		73	44	11.0	10.3*	9.5		
		76	37	9.9	8.6	8.0		
OR 54	150	74	57	11.0	11.8	10.7*	11.4	10.3
		76	53	10.5	10.9*	9.9		
5416	150	74	55	10.2	10.7	9.8*	10.1	9.3
		76	53	9.3	9.6*	8.7		
5630	150	73	58	9.6	10.4	9.5*	9.9	9.1
		74	56	8.9	9.4*	8.6		
		76	60	9.1	10.0	9.1		
5635	150	74	70	10.3	12.3	11.1	10.9	10.0
		76	62	9.9	11.1	10.1*		
		78	41	10.5	9.5*	8.8		
5651	150	74	76	11.6	14.6	13.1	11.7	10.6
		76	62	9.8	11.0*	9.9*		
		78	38	10.9	9.6	8.9		
5669	149	73	68	9.6	11.4	10.3	11.4	10.3
		76	59	10.3	11.3*	10.2*		
5641	150	73	70	11.2	13.5	12.2	11.6	10.5
		76	59	8.9	9.7*	8.8*		
5643	150	73	61	10.0	11.1	10.1*	10.8	9.9
		76	52	10.3	10.5*	9.6		
5698	150	73	53	10.8	11.2*	10.2*	10.3	9.5
		76	45	10.0	9.5	8.8		
5709	150	72	61	7.7	8.6	7.8*	7.9	7.2
		73	52	7.7	7.8*	7.2		
		76	40	8.1	7.3	6.7		

[z]Mean of 4 replications; subplots of 5' were harvested from 20' plots on each harvest date; rows 36" apart; days = days from planting; % = percent 1-4 sieve grades; adj. 50% = tons/acre adjusted to 50% 1-4 sieve; adj. 60% = tons/acre adjusted to 60% 1-4 sieve. Analysis of variance (Table 5) was calculated using the harvest marked with *.

[y]Average Adj. T/A is a rough estimate because of non-uniform number of harvests included.

Table 4. Dollar return/acre for standard OSU bean lines, Corvallis, 1999.[z]

Trial	Line	Harvest 1			Harvest 2			Harvest 3			Harvest 4			Harvest 5			Harvest 6			Avg.
		Days	%	$	Days	%	$	Days	%	$	Days	%	$	Days	%	$	Days	%	$	$/A[y]
1	91G	84	79	1075	86	76	1404	88	59	2038	90	53	1978	91	45	2126				1724
22-Apr	OR 54	86	90	1128	89	78	1791	91	61	2303	93	50	2440	95	39	2263	97	31	2173	2016
	5416	91	65	1623	93	54	1952	95	40	2151	97	25	2078							1951
	5630	84	69	1005	86	57	1261	88	48	1455	90	48	1672	91	38	1652	97	26	1714	1460
	5635	91	61	2311	93	46	2425	95	41	2144										2293
	5651	91	71	2437	93	55	2644	95	49	2469	97	37	2210							2440
	5669	86	81	1548	88	67	1699	89	66	1816	91	47	1993	92	41	1969				1805
2	91G	72	66	2136	73	50	2045	75	39	2119	77	30	2038							2085
24-May	OR 54	72	85	2088	74	67	2250	77	41	2154	79	38	2332							2206
	5416	77	40	2176	79	38	2027													2102
	5630	70	78	1799	72	69	1869	73	65	2028	74	50	1978	77	41	2066	79	36	1986	1954
	5635	74	70	2524	77	54	2129	80	44	2040	81	43	2020							2178
	5651	77	59	2356	79	54	2133	81	42	2107										2199
	5669	72	77	2177	73	64	2047	74	66	2207	75	55	2220	77	53	1576	79	36	1970	2033
3	91G	72	57	1843	73	44	1653	76	37	1466										1654
1-Jun	OR 54	74	57	1865	76	53	1758													1812
	5416	74	55	1724	76	53	1518													1621
	5630	73	58	1649	74	56	1518	76	60	1608										1592
	5635	74	70	1942	76	62	1716	78	41	1601										1753
	5651	74	76	2245	76	62	1727	78	38	1627										1866
	5669	73	68	1810	76	59	1835													1823
	5641	73	70	2104	76	59	1654													1879
	5643	73	61	1763	76	52	1729													1746
	5698	73	53	1701	76	45	1625													1663
	5709	72	61	1369	73	52	1295	76	40	1208										1291

[z]Dollar values were calculated using the weight of graded beans, based on a value of $239 for 2-4 sieve pods; $108 for 5 and 6 sieve pods. Yield of 2 sieve pods was obtained by taking 75% of the combined graded 1+2 sieve pods. Values will be lower than those reported in Table 5 because some beans are lost in the grading process and because 1 sieve pods are excluded.

[y]Average $/acre is a rough estimate because of non-uniform number of harvests included.

Table 5. Statistical comparison of yields of standard OSU lines, Corvallis.1999.[z]

	Line	Trial 1	Trial 2	Trial 3	Comm. Trial	Average Trials 1-4[y]
T/A	91G	12.2	12.5	10.3	11.1	11.5
adj. 50%	OR 54	15.8	12.9	10.9	13.2	13.2
	5416	12.6	13.0	9.6	11.0	11.6
	5630	10.6	11.9	9.4	12.9	11.2
	5635	14.6	13.3	9.5	13.0	12.6
	5641			9.7		
	5643			10.5		
	5651	15.0	13.4	11.0	12.8	13.1
	5669	12.0	13.4	11.3	12.2	12.2
	5698			11.2		
	5709			7.8		
	LSD @ 5%	3.2	NS	2.1	1.7	1.5
T/A	91G	11.8	12.3	10.7	10.7	11.4
adj.60%	OR 54	13.2	12.9	10.7	11.7	12.1
	5416	9.7	12.0	9.8	11.7	10.8
	5630	8.0	11.7	9.5	11.8	10.3
	5635	13.2	12.1	10.1	11.8	11.8
	5641			8.8		
	5643			10.1		
	5651	14.7	13.4	9.9	11.3	12.3
	5669	10.6	12.5	10.2	11.0	11.1
	5698			10.2		
	5709			7.8		
	LSD @ 5%	2.7	NS	1.9	NS	1.7

[z]Based on one selected harvest for each variety, usually the harvest closest to 50% 1-4 sieve (for adj 50%) or 60% 1-4 sieve (for adj 60%), marked with a * in Tables 1-3. Yields are based on field yields of 2-6 sieve beans.

[y]Overall average is a rough estimate because of non-uniform number of trials included.

Table 6. Statistical comparison of dollar value of standard OSU lines, Corvallis.1999.[z]

	Line	Trial 1	Trial 2	Trial 3	Comm. Trial	Average Trials 1-4[y]
$/A	91G	2089	2143	1799	1924	1989
adj. 50%	OR 54	2716	2274	1862	2256	2277
	5416	2132	2287	1631	1908	1990
	5630	1819	2059	1598	2179	1914
	5635	2539	2259	1678	2211	2172
	5641			1638		
	5643			1808		
	5651	2589	2300	1843	2180	2228
	5669	2081	2293	1910	2051	2084
	5698			1905		
	5709			1344		
	LSD @ 5%	545	NS	358	283	242
$/A	91G	2155	2250	1975	1978	2090
adj. 60%	OR 54	2482	2374	1995	2148	2250
	5416	1786	2287	1815	2142	2008
	5630	1464	2164	1751	2179	1890
	5635	2437	2259	1867	2211	2194
	5641			1638		
	5643			1872		
	5651	2720	2500	1843	2089	2288
	5669	2081	2339	1910	2051	2095
	5698			1905		
	5709			1437		
	LSD @ 5%	507	NS	354	NS	315

[z]Based on one selected harvest for each variety, usually the harvest closest to 50% 1-4 sieve (for adj 50%) or 60% 1-4 sieve (for adj 60%), marked with a * in Tables 1-3. Yields are based on field yields of 2-6 sieve beans.

[y]Overall average is a rough estimate because of non-uniform number of trials included.

Table 7. Performance of small sieve green bean varieties, Corvallis, 1999.

Trial	Line	Days	Percent Sieve Size[z]				Tons/Acre Sieve Size				Graded Total[x]	$/Acre[w]
			2[y]	3	4	5	2	3	4	5		
1	5613	86	42	51	6	1	1.90	2.32	0.25	0.04	4.51	1352
22-Apr		88	32	57	11	0	1.66	3.01	0.58	0.00	5.25	1585
		90	18	68	14	1	1.20	4.57	0.94	0.04	6.74	2025
		91	14	73	13	0	1.22	6.34	1.12	0.04	8.73*	2625
		92	12	69	18	1	1.03	5.84	1.56	0.07	8.50	2545
	Medinah	84	77	23	0	0	1.31	0.40	0.00	0.00	1.70	515
		86	52	48	0	0	1.28	1.16	0.00	0.00	2.44	736
		88	36	62	2	0	1.22	2.10	0.07	0.00	3.40	1026
		90	32	64	4	0	1.28	2.57	0.18	0.00	4.03	1218
		91	27	69	4	0	1.28	3.26	0.18	0.00	4.72*	1426
	Minuette	88	10	44	36	9	0.57	2.43	1.99	0.47	5.46	1508
		91	5	27	37	30	0.35	1.96	2.65	2.14	7.17	1497
		92	4	27	43	25	0.30	2.10	3.34	1.92	7.73*	1732
2	5613	72	32	65	3	0	1.88	3.81	0.18	0.00	5.86	1771
24-May		73	28	69	4	0	2.01	4.93	0.25	0.00	7.20	2173
		74	25	71	4	0	1.82	5.26	0.29	0.00	7.37*	2225
		77	24	52	21	3	1.39	3.05	1.23	0.18	5.88	1711
	Medinah	72	75	25	0	0	2.77	0.94	0.00	0.00	3.72	1122
		74	55	45	0	0	3.07	2.50	0.00	0.00	5.57	1683
		77	32	67	1	0	2.01	4.17	0.07	0.00	6.25*	1888
		79	29	70	1	0	2.34	5.58	0.11	0.00	8.03	2425
		81	25	73	1	1	2.26	6.60	0.11	0.07	9.07	2707
	Minuette	72	12	62	26	0	0.87	4.57	1.89	0.00	7.32	2211
		73	9	62	29	0	0.65	4.53	2.14	0.04	7.36	2211
		74	5	44	48	2	0.44	3.92	4.24	0.22	8.81*	2595
		77	5	33	51	10	0.52	3.26	5.00	0.98	9.76	2652

Table 7. Performance of small sieve green bean varieties, Corvallis, 1999 (cont.).

Trial	Line	Days	Percent Sieve Size[z]				Tons/Acre Sieve Size				Graded Total[x]	$/Acre[w]
			2[y]	3	4	5	2	3	4	5		
3	5446	67	22	53	21	4	1.17	2.86	1.12	0.22	5.37	1557
1-Jun		69	15	43	31	10	1.06	3.05	2.21	0.69	7.08	1908
		71	11	37	39	13	0.92	3.08	3.23	1.05	8.28*	2184
	5613	72	40	59	1	0	2.07	3.01	0.04	0.00	5.11	1544
		73	28	65	7	0	1.71	3.95	0.40	0.00	6.06	1831
		76	23	70	7	0	1.39	4.31	0.44	0.00	6.14*	1853
	5723	74	8	43	30	18	0.46	2.47	1.74	1.05	5.75	1409
		76	5	41	33	20	0.33	2.72	2.14	1.34	6.56*	1565
		78	4	31	44	21	0.27	2.32	3.26	1.60	7.49	1768
	5747	70	25	49	23	3	1.06	2.10	0.98	0.15	4.29	1251
		72	16	49	31	4	0.71	2.21	1.41	0.18	4.51	1308
		73	13	49	32	6	0.68	2.50	1.63	0.33	5.14*	1453
	5803	70	16	49	33	3	1.11	3.41	2.28	0.22	7.02	2055
		72	11	44	41	4	0.73	2.86	2.72	0.25	6.57	1908
		73	9	44	43	4	0.65	3.05	3.01	0.29	7.00*	2025
	5804	70	17	60	23	1	1.06	3.81	1.45	0.04	6.35	1908
		72	11	50	35	4	0.79	3.63	2.54	0.25	7.20*	2099
		73	11	45	39	4	0.68	2.68	2.36	0.25	5.97	1727
	5842	69	17	46	31	7	1.20	3.30	2.21	0.51	7.21	2025
		70	14	37	33	16	1.20	3.08	2.76	1.31	8.37*	2124
		72	8	27	43	22	0.73	2.36	3.70	1.89	8.67	2050
	5844	69	23	50	21	5	1.63	3.48	1.49	0.36	6.96	1992
		71	11	45	32	12	0.90	3.52	2.54	0.94	7.89*	2099
		73	7	37	42	13	0.54	2.86	3.26	1.02	7.69	2014
	5860	69	16	81	3	0	0.90	4.68	0.18	0.00	5.75*	1738
		71	10	76	15	0	0.57	4.53	0.87	0.00	5.97	1804
		73	8	65	27	0	0.54	4.35	1.81	0.00	6.71	2025
	Medinah	73	54	46	0	0	2.80	2.36	0.00	0.00	5.16	1557
		74	40	58	2	0	2.28	3.34	0.11	0.00	5.73	1730
		76	36	64	0	0	2.04	3.63	0.00	0.00	5.66*	1711
	Minuette	70	24	63	12	1	1.06	2.79	0.54	0.04	4.43	1327
		72	11	65	22	2	0.54	3.12	1.05	0.11	4.82	1423
		73	7	63	26	4	0.41	3.59	1.49	0.22	5.70*	1656

[z]Percent calculated as % of total of 2-6 sieve beans. 2 sieve values calculated as 75% of the combined 1+ 2 sieve weights from grader.

[x]Total weight of graded beans, including sieve sizes 2-6. Values will be lower than those reported in Table 7 because some beans are lost in the grading process and because 1 sieve pods are excluded. Occasional 6 sieve are not shown in table, but are included in graded total.

[w]$/acre based on $302/ton for 2-4 sieve; $0/ton for 5-6 sieve.

Table 8. Statistical comparison of yields and dollar return of small sieve green bean lines, Corvallis, 1999.[z]

	Variety	Trial 1	Trial 2	Trial 3	Comm. Trial	Average Trials 1-4[y]
T/A	5446			8.8		
	5613	9.5	8.3	7.0	6.6	7.9
	5723			6.9		
	5747			5.7		
	5803			7.5		
	5804			7.8		
	5842			9.1		
	5844			8.4		
	5860			6.3		
	Medinah	5.4	7.2	6.6	7.2	6.6
	Minuette	8.0	9.3	6.0	7.9	7.8
	LSD @ 5%	NS	0.8	2.6	NS	NS
$/A	5446			2106		
	5613	2867	2496	1819	2032	2304
	5723			1652		
	5747			1429		
	5803			1891		
	5804			2174		
	5842			2299		
	5844			2246		
	5860			1905		
	Medinah	1642	2179	1715	2222	1940
	Minuette	1804	2744	1527	2398	2118
	LSD @ 5%	1101	254	713	NS	NS

[z]Based on one selected harvest for each variety in each trial, which was the last harvest, (highest $/A) unless sieve size distribution or notes indicated the variety was overmature (marked with * on Table 7). Yields are field yields of 2-6 sieve beans.

[y]Overall average is a rough estimate because of non-uniform number of trials included.

Table 9. Performance of commercial green bean varieties, June 14 planting, Corvallis, 1999.

Variety	Source	Intended Use	Days	Percent Sieve Size[z]					Tons/Acre Sieve Size					Graded Total[x]	$/Acre[w]
				2[y]	3	4	5	6	2	3	4	5	6		
91G	OSU	full sieve	68	13	19	26	38	5	1.28	1.89	2.57	3.88	0.47	10.09	1841
			70	9	15	22	45	10	1.01	1.63	2.43	4.97	1.12	11.16*	1868
			72	6	14	20	47	12	0.71	1.56	2.28	5.26	1.34	11.15	1800
OR 54	OSU	full sieve	70	11	24	29	34	2	1.17	2.50	3.08	3.63	0.18	10.56	2025
			72	8	19	23	42	8	0.98	2.18	2.72	4.86	0.87	11.60*	2022
			73	6	18	20	46	9	0.73	2.03	2.32	5.22	1.02	11.32	1888
5416	OSU	full sieve	70	13	25	35	26	1	1.28	2.43	3.34	2.47	0.11	9.62	1961
			71	9	27	27	33	4	0.98	3.08	3.08	3.70	0.40	11.24	2149
			73	7	15	24	47	7	0.79	1.56	2.57	5.04	0.76	10.72*	1803
5630	OSU	full sieve	68	12	24	38	25	1	1.22	2.36	3.81	2.54	0.07	10.00	2047
			70	9	20	35	35	2	0.95	2.14	3.77	3.81	0.22	10.88	2074
			72	7	18	33	39	4	0.73	1.99	3.70	4.28	0.40	11.10*	2041
5635	OSU	full sieve	70	12	32	31	24	1	1.14	3.19	3.01	2.39	0.11	9.84	2025
			72	10	27	28	32	3	1.06	2.97	3.08	3.52	0.29	10.92	2111
			73	8	23	25	39	5	0.90	2.65	2.86	4.57	0.62	11.59*	2091
5651	OSU	4-5 sieve	70	11	28	32	29	1	1.14	2.94	3.41	3.08	0.11	10.68	2134
			72	7	21	30	40	2	0.71	2.28	3.23	4.31	0.25	10.78	1979
			73	7	21	25	43	4	0.82	2.43	3.01	5.08	0.47	11.80*	2093
5669	OSU	4-5 sieve	68	13	27	40	20	0	1.28	2.72	4.02	2.07	0.00	10.09	2140
			70	11	26	33	30	0	1.09	2.50	3.15	2.86	0.04	9.64	1925
			72	7	22	32	37	2	0.68	2.28	3.34	3.88	0.22	10.39*	1948
SB 4248	Novartis	full sieve	67	14	22	26	34	4	1.36	2.07	2.43	3.15	0.40	9.41	1783
			70	8	16	25	44	7	0.79	1.52	2.43	4.35	0.69	9.78*	1677
			72	6	14	17	45	18	0.68	1.45	1.85	4.79	1.89	10.66	1671

Table 9. Performance of commercial green bean varieties, June 14 planting, Corvallis, 1999 (cont.).

Variety	Source	Intended Use	Days	Percent Sieve Size[z]					Tons/Acre Sieve Size					Graded Total[x]	$/Acre[w]
				2[y]	3	4	5	6	2	3	4	5	6		
Green Arrow	Crites	4 sieve	70	15	35	41	9	0	1.33	3.01	3.52	0.76	0.00	8.62*	1960
	Moscow		71	14	38	36	11	0	1.09	3.08	2.90	0.91	0.00	7.98	1791
			73	9	29	45	16	1	0.76	2.61	4.02	1.41	0.07	8.87	1928
Scuba	Crites	4 sieve	67	16	29	45	9	0	1.11	1.99	3.15	0.65	0.00	6.90	1571
	Moscow		68	13	28	46	13	0	0.98	2.07	3.34	0.94	0.00	7.33	1627
			70	9	33	46	11	0	0.79	2.94	4.06	1.02	0.00	8.81*	1974
SB 4218	Novartis	4 sieve	66	8	22	35	31	3	0.60	1.60	2.54	2.21	0.22	7.17*	1393
			67	10	17	33	36	4	0.71	1.20	2.25	2.47	0.29	6.92	1290
			70	8	17	28	39	9	0.73	1.56	2.57	3.63	0.83	9.32	1645
Klondyke	Seminis	full sieve wax	68	20	39	36	5	0	1.66	3.15	2.94	0.40	0.00	8.15	1895
			70	13	32	42	13	0	1.22	3.01	3.99	1.20	0.00	9.42	2094
			72	9	25	37	28	0	0.90	2.36	3.52	2.68	0.00	9.46*	1912
Indy Gold	Novartis	4 sieve wax	66	8	31	43	18	0	0.57	2.14	3.01	1.27	0.00	6.99	1504
			67	8	28	42	21	1	0.60	1.99	2.94	1.49	0.04	7.06*	1486
			70	6	18	33	42	2	0.52	1.56	2.86	3.66	0.18	8.78	1595
EX 8104639	Seminis	4 sieve wax	67	13	34	42	10	0	0.87	2.28	2.83	0.69	0.00	6.67	1508
			68	15	29	39	16	0	1.22	2.36	3.12	1.27	0.00	7.97*	1742
			70	11	32	40	17	0	0.84	2.54	3.12	1.34	0.00	7.84	1698
WB #34	Pure Line	4 sieve	67	17	47	34	2	0	1.06	3.01	2.21	0.15	0.00	6.43	1517
			68	14	39	42	5	0	1.11	3.12	3.34	0.40	0.00	7.97	1852
			70	10	41	43	6	0	0.98	3.88	4.02	0.54	0.00	9.42*	2181
5613	OSU	3 sieve	67	51	48	1	0	0	2.28	2.18	0.04	0.00	0.00	4.50	1357
			68	50	49	1	0	0	2.39	2.36	0.04	0.00	0.00	4.79	1445
			70	39	59	3	0	0	2.20	3.34	0.15	0.00	0.00	5.69*	1716
Minuette	Harris Moran	3 sieve	67	28	59	13	0	0	1.50	3.15	0.69	0.00	0.00	5.34	1612
			68	17	60	22	1	0	1.06	3.73	1.38	0.04	0.00	6.21	1864
			70	12	54	32	1	0	0.87	3.95	2.36	0.11	0.00	7.29*	2168

Table 9. Performance of commercial green bean varieties, June 14 planting, Corvallis, 1999 (cont.).

Variety	Source	Intended Use	Days	Percent Sieve Size[z]					Tons/Acre Sieve Size					Graded Total[x]	$/Acre[w]
				2[y]	3	4	5	6	2	3	4	5	6		
51-98	Pure Line	3 sieve	70	31	67	2	0	0	2.31	4.97	0.15	0.00	0.00	7.43	2242
			71	27	69	5	0	0	1.88	4.86	0.33	0.00	0.00	7.07	2132
			73	18	72	10	0	0	1.44	5.76	0.80	0.00	0.00	8.00*	2417
Medinah	Novartis	2-3 sieve	68	70	30	0	0	0	3.18	1.34	0.00	0.00	0.00	4.52	1366
			70	50	50	0	0	0	2.53	2.57	0.00	0.00	0.00	5.10	1541
			72	43	55	2	0	0	2.66	3.44	0.11	0.00	0.00	6.21*	1877
EX 390	Seminis	2-3 sieve	67	26	63	11	0	0	1.60	3.92	0.69	0.00	0.00	6.21*	1875
			70	14	73	13	0	0	1.03	5.26	0.91	0.00	0.00	7.20	2173
Proton	Pure Line	2 sieve	67	99	1	0	0	0	5.41	0.04	0.00	0.00	0.00	5.45	1645
			70	98	2	0	0	0	6.33	0.15	0.00	0.00	0.00	6.48*	1957
			72	99	1	0	0	0	7.15	0.11	0.00	0.00	0.00	7.26	2192

[z]Percent calculated as % of total of 2-6 sieve beans.

[y]2 sieve values calculated as 75% of the combined 1 + 2 sieve weights from the grader.

[x]Total weight of the graded beans, including sieve sizes 2-6. Values will be lower than those reported in Table 9 because some beans are lost in the grading process and because 1 sieve pods are excluded.

[w]$/acre based on $239/ton for 2-4 sieve and $108/ton for 5-6 sieve for full sieve and 4 sieve beans; and $302/ton for 2-4 sieve and $0/ton for 5-6 sieve for small sieve beans.

Table 10. Statistical comparison of yields and dollar return of commercial green bean lines, Corvallis, 1999.

Variety	Intended Use	T/A Unadjusted	T/A Adjusted[y]	$/A
91G	full sieve	11.5	11.1	1925
OR 54	full sieve	12.9	13.2	2256
5416	full sieve	11.3	11.0	1908
5630	full sieve	11.9	12.9	2179
5635	full sieve	12.3	13.0	2211
5651	4-5 sieve	12.3	12.8	2180
5669	4-5 sieve	10.9	12.2	2051
SB 4248	full sieve	10.5	10.5	1809
Green Arrow	4 sieve	9.6	9.6	2177
Scuba	4 sieve	9.2	9.2	2049
SB 4218	4 sieve	7.9	7.9	1538
Klondyke	full sieve wax	10.4	12.6	2089
Indy Gold	4 sieve wax	7.8	7.8	1635
EX 8104639	4 sieve wax	8.9	8.9	1933
WB #34	3-4 sieve	10.1	10.1	2341
5613	3 sieve	6.6	6.6	2032
Minuette	3 sieve	7.9	7.9	2398
51-98	3 sieve	8.8	8.8	2690
Medinah	2-3 sieve	7.2	7.2	2222
EX 390	2-3 sieve	7.0	7.0	2155
Proton	2 sieve	8.8	8.8	2724
Oja	romano	13.3	13.3	
Tapia	romano	11.1	11.1	
Roma II	romano	11.1	11.1	
LSD @5%		1.5	1.5	330

[z]Based on one selected harvest for each variety (marked with * on Table 9), which was the harvest closest to optimal based on that variety's intended use (50% 1-4 sieve for full sieve). Yields are field vields.

[y]Full sieve and 4-5 sieve beans were adjusted to 50% 1-4 sieve; all others were unadjusted

Table 11. Fusarium root rot infection, Corvallis,1999.

Line	Score[z] Rep 1	Rep 2	Average	Notes
91G	2.0	3.0	2.50	
OR 54	2.0	3.5	2.75	
5630	2.0	4.0	3.00	
5635	2.5	3.5	3.00	
5640	2.0	3.0	2.50	
5641	3.0	3.0	3.00	
5643	2.5	2.5	2.50	
5644	1.0	2.5	1.75	
5651	2.5	3.5	3.00	
5669	2.0	4.0	3.00	
5681	2.5	3.0	2.75	
5682	3.5	2.0	2.75	
5683	3.0	4.5	3.75	
5684	3.5	4.0	3.75	
5692	2.0	4.0	3.00	
5697	4.0	4.0	4.00	
5698	2.5	4.0	3.25	
5699	2.5	3.0	2.75	
5701	3.5	3.0	3.25	
5705	1.0	2.5	1.75	
5706	2.0	4.0	3.00	
5709	2.5	3.5	3.00	
5711	2.0	1.5	1.75	poor stand
5712	2.0	1.0	1.50	
5713	1.5	2.5	2.00	poor stand
5714	1.5	1.5	1.50	
5723	1.0	2.0	1.50	
5724	1.0	2.5	1.75	
5730	2.0	2.5	2.25	
5731	3.0	4.5	3.75	
5732	4.0	4.0	4.00	
5733	2.5	3.5	3.00	
5735	3.5	4.0	3.75	
5736	2.0	1.5	1.75	
5737	2.0	3.5	2.75	
5747	3.0	3.0	3.00	
5754	2.0	3.0	2.50	
5757	2.0	3.5	2.75	
5761	1.5	2.0	1.75	
5766	1.5	1.5	1.50	
5769	0.5	1.5	1.00	
5770	2.5	3.0	2.75	
5776	3.0	3.5	3.25	
5778	1.0	3.5	2.25	
5789	3.5	3.5	3.50	
5790	4.5	4.0	4.25	
5792	2.0	3.0	2.50	

Table 11. Fusarium root rot infection, Corvallis,1999 (cont).

Line	Score[z] Rep 1	Rep 2	Average	Notes
5793	2.5	3.5	3.00	
5796	3.5	5.0	4.25	
5797	2.5	3.5	3.00	
5798	3.0	4.5	3.75	plants stunted
5799	1.5	4.0	2.75	
5800	3.5	3.0	3.25	
5802	3.0	4.0	3.50	
5803	3.5	4.0	3.75	
5804	3.0	4.0	3.50	
5805	2.5	3.5	3.00	
5807	3.0	2.0	2.50	
5808	3.0	4.0	3.50	
5809	2.0	4.5	3.25	
5810	4.0	4.0	4.00	
5811	3.5	2.5	3.00	
5813	2.5	3.5	3.00	
5814	3.5	3.5	3.50	
5815	2.5	5.0	3.75	plants very stunted
5816	3.0	3.5	3.25	
5818	3.0	2.0	2.50	
5819	2.0	4.0	3.00	
B 7030-24	1.5	0.5	1.00	
B 7126-1-1-1	0.5	0.5	0.50	very late
B 7126-33-1-2	1.5	3.5	2.50	
B 7126-33-2-1	2.5	3.0	2.75	
B 7126-54-2-1	2.0	2.0	2.00	poor stand
B 7237-13	3.0	2.5	2.75	
B 7238-22	3.5	2.5	3.00	
B 7239-5-2	3.0	2.0	2.50	
B 7239-5-4	2.5	3.0	2.75	
B 7239-11-2	2.5	4.5	3.50	
B 7240-2	1.0	3.5	2.25	poor stand
DM3NY1	1.5	3.0	2.25	poor stand
DM4NY6	1.0	2.5	1.75	highly variable
DM6NY1	0.5	1.5	1.00	
FR 266	2.0	2.5	2.25	
Medinah	4.5	5.0	4.75	plants very stunted
Minuette	2.0	3.5	2.75	plants very stunted
NY 5517	3.0	3.0	3.00	
RR 4270	1.5	1.0	1.25	
RR 6950	0.5	0.5	0.50	
WIS 83RR	0.5	0.5	0.50	
WIS 46RR	1.0	0.5	0.75	
LSD @ 5%			1.36	

[z]Scores: 1-5 scale; 1=none or very slight surface infection, 5=roots mostly dead, plants stunted.

Table 12. White mold infection, Corvallis, 1999[z]

Line	White Mold Score					Yield[y]	Habit[x]
	Rep 1	Rep 2	Rep 3	Rep 4	AV	AV	AV
91G	9	8	8	9	8.50	2.8	1.8
Ore. 54	9	8	10	9	9.00	3.0	2.3
5416	8	10	9	9	9.00	3.0	1.8
5600	6	8	9	8	7.75	3.5	2.0
5613	9	9	10	9	9.25	2.5	2.5
5630	5	9	9	9	8.00	3.0	2.0
5635	9	9	8	9	8.75	2.8	2.0
5747	4	6	5	7	5.50	2.5	3.8
B7237-14-3	7	8	9	4	7.00	2.0	2.0
B7318-2-1-1-1	7	6	6	7	6.50	3.3	2.8
B7318-2-2-2-1	5	7	5	5	5.50	3.3	3.5
B7321-5-1-2-1	8	5	5	7	6.25	2.3	2.5
B7323-4-1-1-2	6	5	4	5	5.00	2.8	3.8
B7323-4-1-2-1	7	5	7	9	7.00	3.5	3.8
B7323-5-2-1-1	2	6	5	6	4.75	2.8	3.0
B7324-2-2-1-1	8	9	7	5	7.25	3.3	3.3
B7324-3-2-2-1	8	7	4	6	6.25	2.8	4.8
B7329-1-1-2-1	5	8	6	5	6.00	2.5	2.5
B7329-1-2-2-1	2	3	6	8	4.75	3.3	3.5
B7329-2-1-2-2	2	8	6	5	5.25	3.3	3.6
B7329-11-1-2-1	6	7	5	4	5.50	2.8	3.0
B7334-9-2-2-1	4	1.5	2	4	2.88	2.3	4.0
B7335-7-1-1-2	4	4	4	5	4.25	2.5	4.5
B7335-7-1-2-1	4	4	3	4	3.75	2.3	4.3
B7335-7-2-1-1	4	4	6	4	4.50	2.8	3.8
B7339-1-1-1-2	3	5	7	9	6.00	3.3	3.8
B7344-5-1-1	1	3	2	9	3.75	2.8	3.0
B7344-9-2-2-1	1	2	2	3	2.00	2.8	4.6
B7345-5-1-1-1	8	7	4	6	6.25	2.3	3.5
B7345-5-1-2-1	3	8	8	9	7.00	2.0	3.6
B7354-1-2-1-1	4	5	7	8	6.00	3.0	3.0
B7354-2-1-1-1	6	8	5	9	7.00	2.3	2.5
B7354-2-2-1-2	7	8	9	6	7.50	2.8	2.0
B7354-2-2-2-1	4	6	3	8	5.25	2.3	2.3
B7354-6-2-1	2	1	4	3	2.50	2.0	4.0
B7356-4-1-1	3	8	8	4	5.75	2.5	2.8
76-110	7	9	9	8	8.25	1.3	1.5
Minuette	8	9	8	9	8.50	3.3	2.3
Ex Rico	5	7	7	7	6.50	3.0	2.3
L192	1	3	3	1	2.00	3.0	4.3
MO 162	3	2	1	2	2.00	2.3	3.3
225846	7	7	3	7	6.00	2.3	2.8
824775	6	8	7	4	6.25	2.8	2.8
SB 4123	8	8	7	8	7.75	3.3	2.0
FR 266	3	5	5	7	5.00	2.0	2.8
H9658	5	5	9	7	6.50	2.8	3.3
H9658-7	3	5	4	4	4.00	2.8	3.3

Table 12. White mold infection, Corvallis, 1999 (cont.)[z]

Line	White Mold Score					Yield[y]	Habit[x]
	Rep 1	Rep 2	Rep 3	Rep 4	AV	AV	AV
H9658-9	3	4	5	4	4.00	2.5	3.5
H9658-65	4	8	8	6	6.50	2.5	3.0
H9658-67	7	5	6	7	6.25	3.0	3.8
NY5517	10	9	9	7	8.75	2.3	2.3
NY5521	5	9	9	9	8.00	2.8	1.8
NY5523	9	9	9	10	9.25	1.5	2.0
NY5773	1.5	2	5	7	3.88	3.3	3.8
NY5814-3	8	8	7	8	7.75	2.3	2.0
NY5950	8	9	8	8	8.25	2.5	3.3
NY5972	3	4	4	4	3.75	2.8	4.0
NYBS6637	2	5	5	5	4.25	3.0	3.0
NYBS6643	8	3	4	8	5.75	3.3	3.0
NYBS6653	8	8	8	4	7.00	3.0	2.3
NYBS6670	4	6	3	5	4.50	3.0	3.5
NYBS6671	4	5	4	5	4.50	2.8	3.3
NY1-6020-5	2	4	5	5	4.00	3.0	3.3
NY-15-161-C	7	8	6	6	6.75	3.3	2.5
NY-15-161W	3	8	8	9	7.00	3.0	3.0
NY2-5984-1	3	3	6	4	4.00	3.5	4.1
NY-CT89-61	10	9	10	9	9.50	1.0	1.3
NY-CT89-63	10	10	10	10	10.00	1.3	2.3
NY-CT89-124	8	7	6	8	7.25	2.9	2.8
LSD @ 5%					2.09		

[z]White mold scores: 1-10, 1 = low incidence, no symptoms observed, 10 = high incidence, all plants in plot infected

[y]Visual observation of yield: 0 = no bean set, 4 = high bean set.

[x]Upright habit: 1 = flat, 5 = vertically upright.

Figure 1. Standard Bean $/A 1999 - April 22 Planting

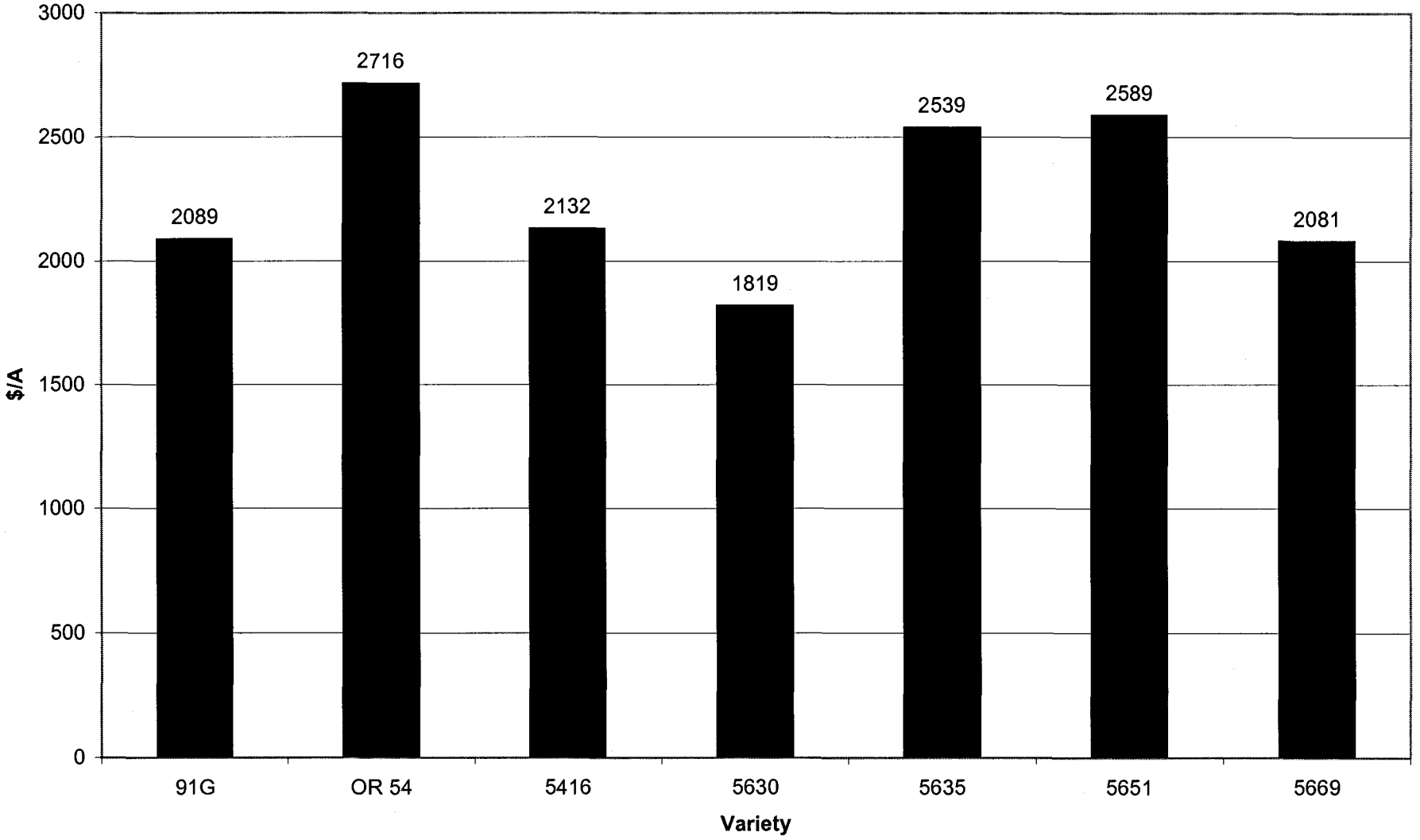

Figure 2. Standard Bean $/A 1999 - May 24 Planting

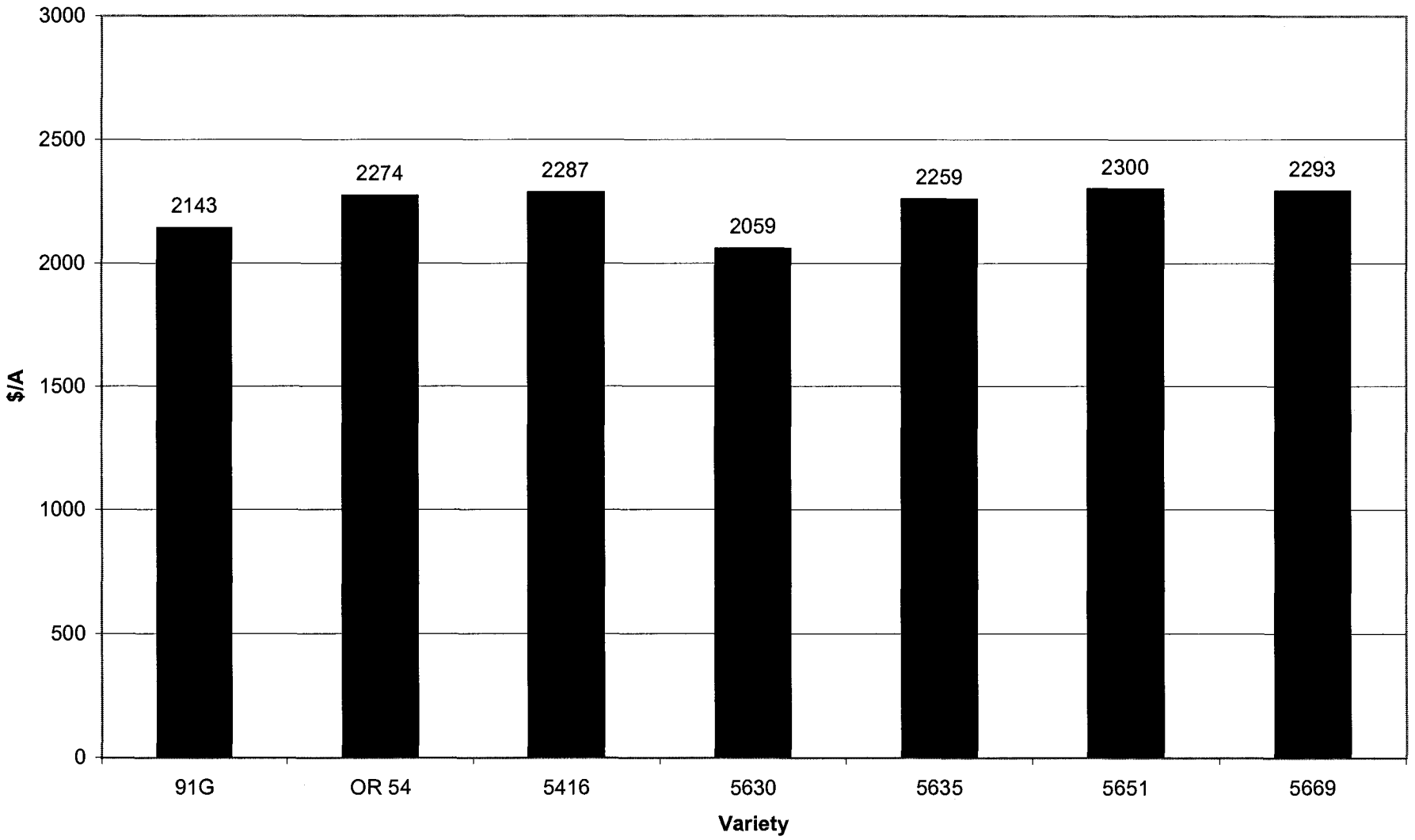

Figure 3. Standard Bean $/A 1999 - June 1 Planting

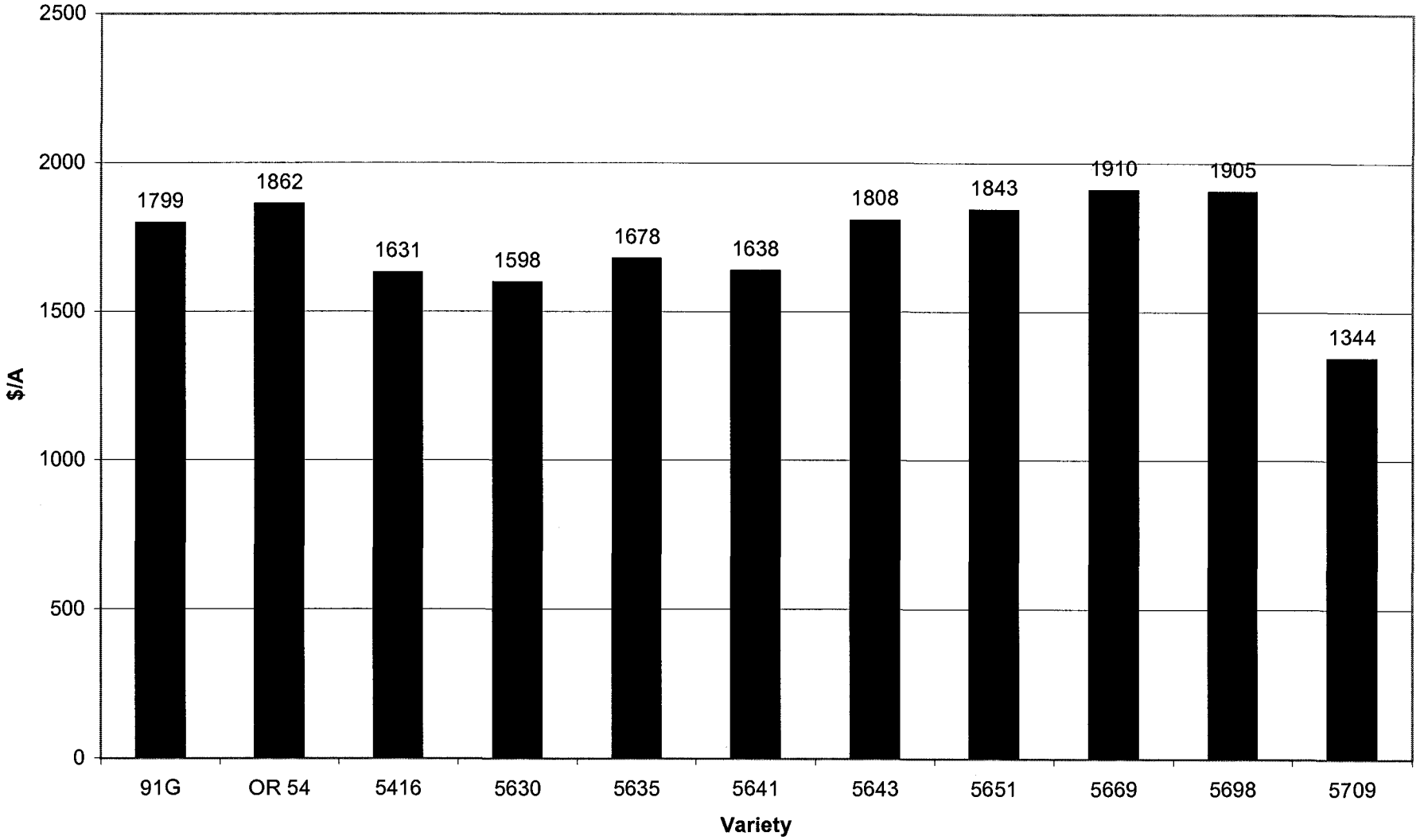

Figure 4. Standard Bean $/A 1999 Season Average - Selected Harvests

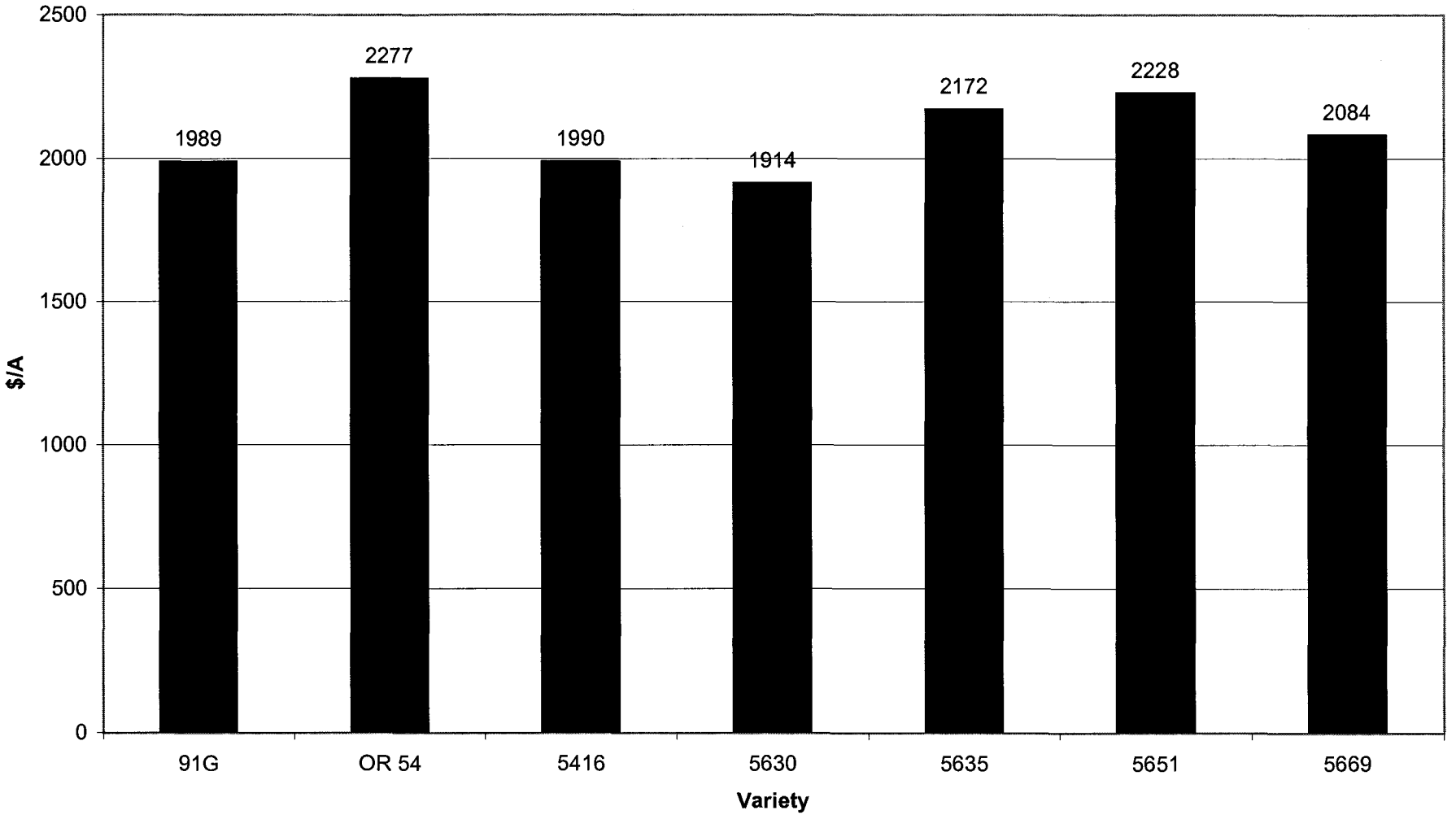

Figure 5. Small Sieve Bean $/A 1999 - April 22 and May 24 Plantings

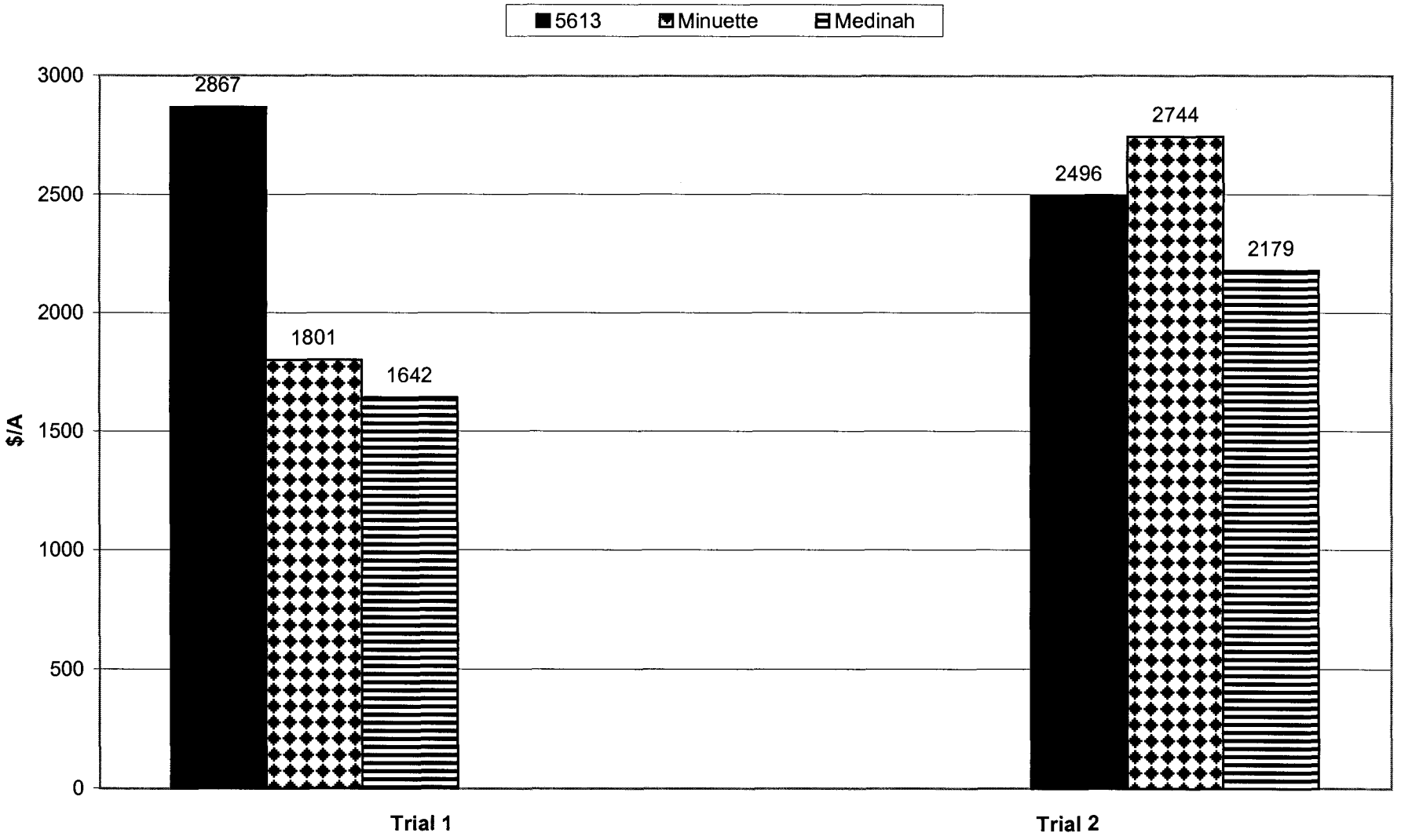

Figure 6. Small Sieve Bean $/A 1999 - June 1 Planting

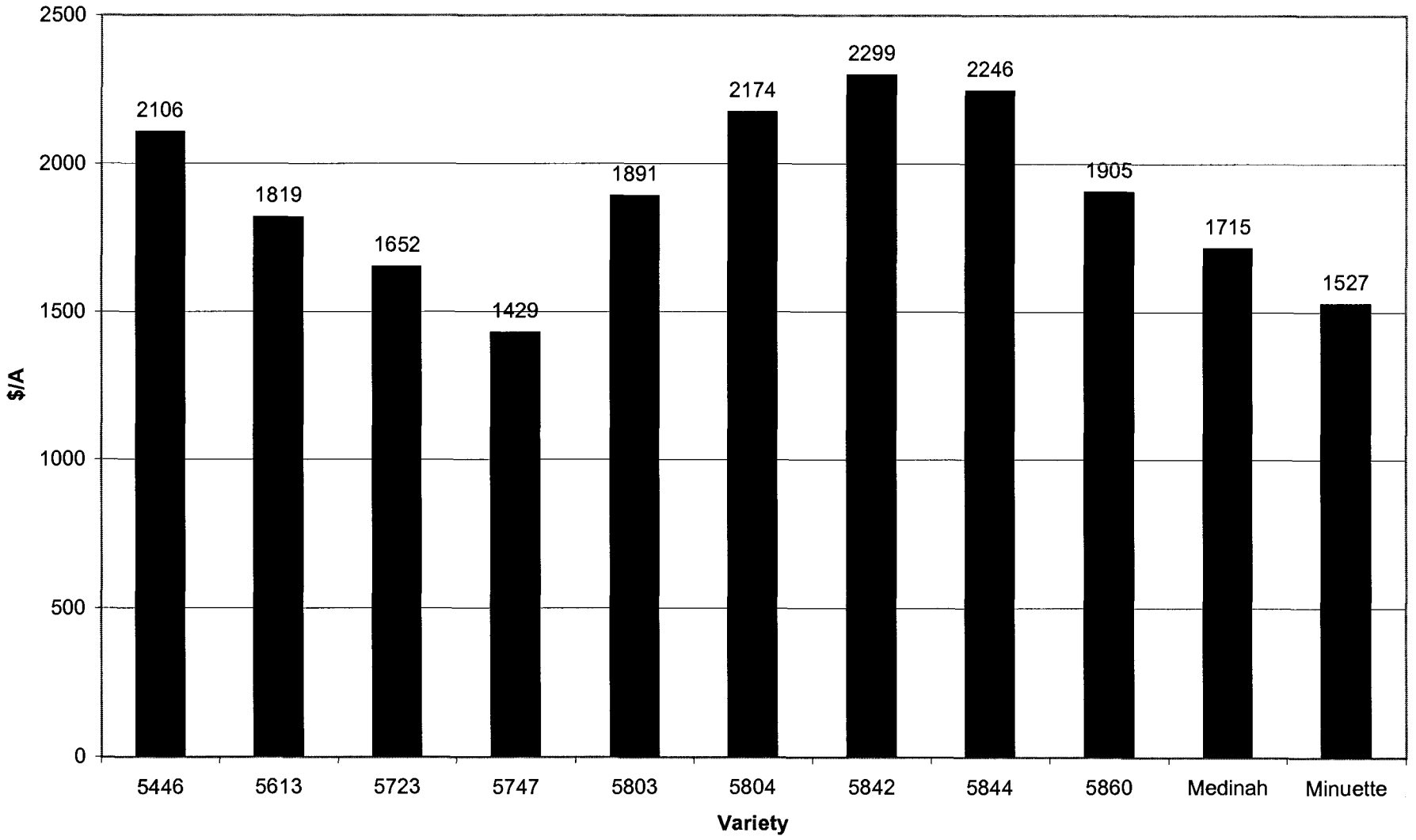

Figure 7. Small Sieve Bean $/A 1999 - Season Average - Selected Harvests

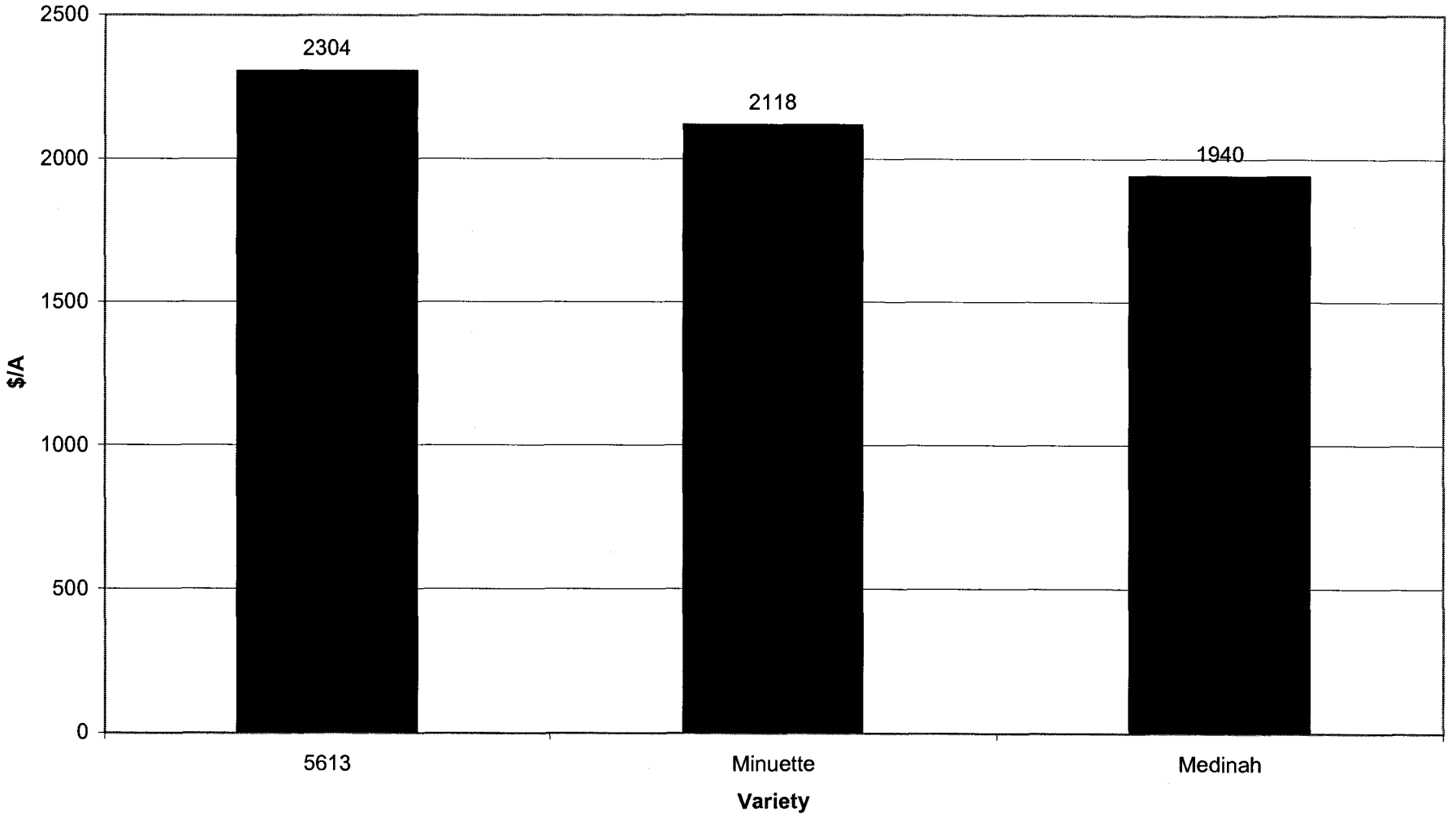

Figure 8. Commercial Bean $/A 1999 - Full Sieve Varieties

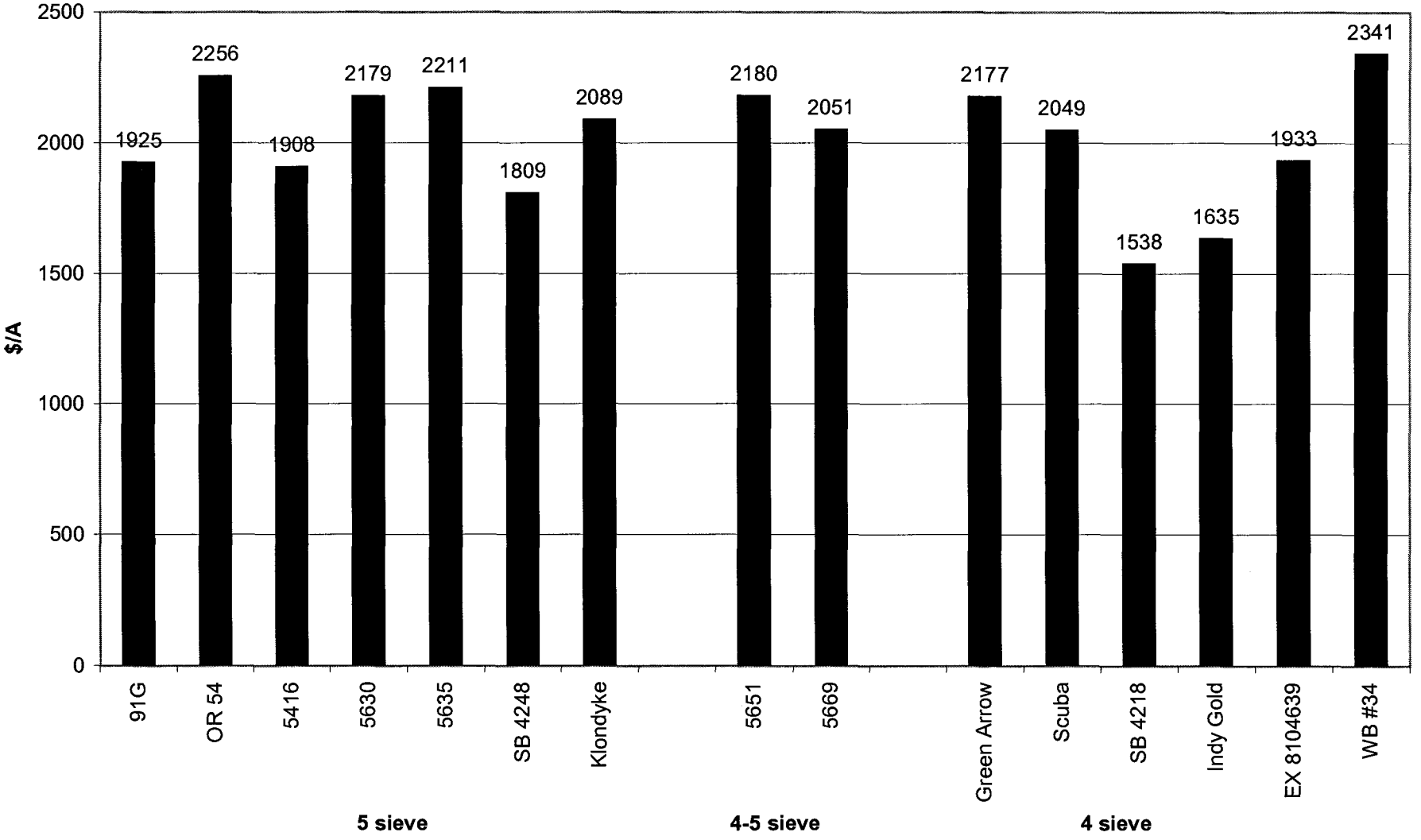

Figure 9. Commercial Bean $/A - Small Sieve Varieties

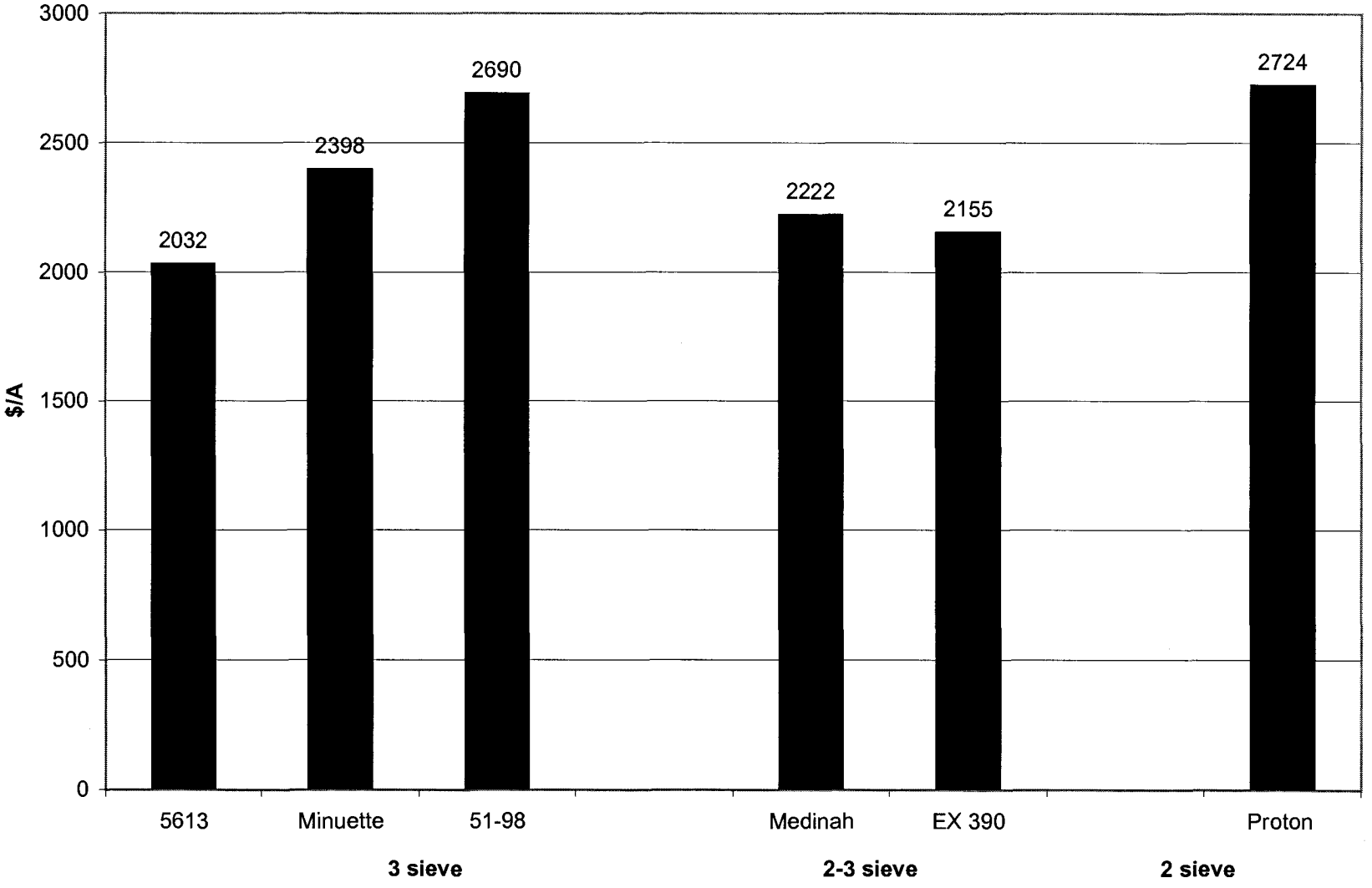

Figure 10. Standard Bean $/A 1999 - Four Year AVerage

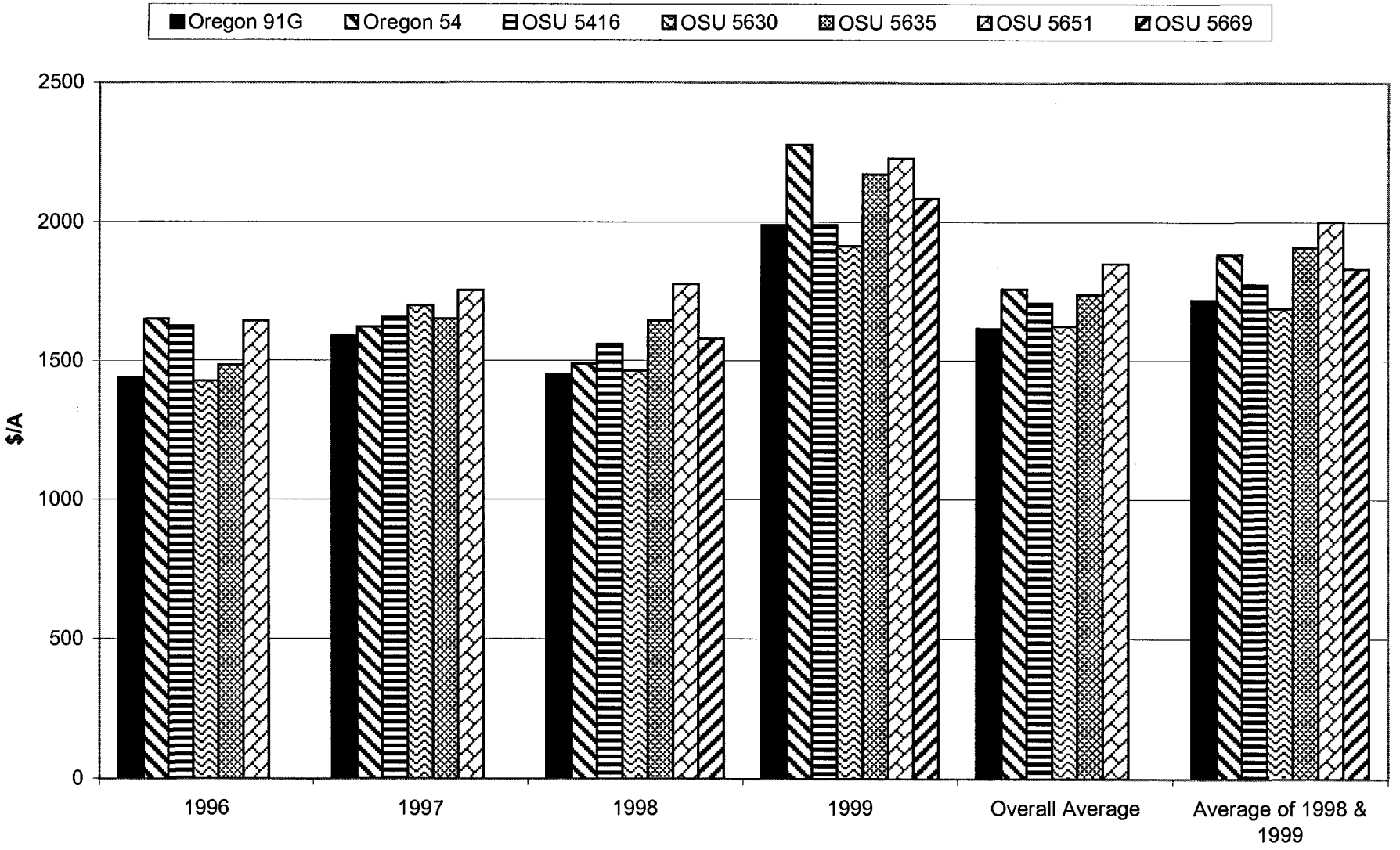

Figure 11. Small Sieve Bean $/A 1999 - Five Year Average