OPVC CONTINUING PROJECT REPORT: *2014* **PROJECT YEAR**:
1. OPVC REPORT COVER PAGE (maximum 2 pages)
OPVC Project Number:
Project Title: Green Bean Breeding and Evaluation 2014
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Total Project Request (all years): Year 1: Year 2: Year 3:

2. EXECUTIVE SUMMARY (ABSTRACT): Oregon is the second largest producer of processed green beans, and cultivars are needed that are adapted to western Oregon. The types that have traditionally been used are the bush blue lake (BBL) green beans with high yields, excellent processing quality. On the other hand, then need improvement in plant architecture, disease resistance (especially to white mold), and are genetically isolated from other green beans. The primary objective of the OSU green bean breeding program is to develop high yielding and high quality BBL green beans with high levels of white mold resistance. In 2014, a preliminary yield and processing trial of 36 advanced lines was conducted. An additional commercial trial with 28 entries was also grown and evaluated. Two advanced lines (6771 and 6774) are undergoing intense scrutiny for release as the first partially white mold resistant lines commercially available. Data obtained over four years of evaluation supports their release and seed has been distributed to seed companies for preliminary increase and evaluation.

3. FULL REPORT (no maximum)

3.a. BACKGROUND Green beans grown for canning and freezing in the Willamette Valley contribute about $23 million to the Oregon state economy each year. The industry produces a high quality product with the unique flavor, color, and appearance based on the Bush Blue Lake (BBL) class of green beans. The growing environment in Western Oregon is different from any other green bean production area in the United States. Developing productive varieties that are adapted to this area requires the attention of a substantial breeding effort in Western Oregon.

BBL green beans have rather unique characteristics compared to Midwestern green beans. Foremost, they have almost double the yield potential because they put more of their photosynthate into reproductive development and less into vegetative growth. The tradeoff is that BBL plant architecture is not as robust as that of many Midwestern types. BBL green beans have a unique flavor profile, being higher in sugars and the "beany" flavor components, and lower in the "floral" flavors that are more typical of Midwestern beans. BBL and Midwestern green beans have different co-adapted complexes of genes for snap bean traits such that the two groups are somewhat genetically isolated. This creates challenges in introgressing desirable genes from Midwestern types into a BBL background.

Most important at present is the development of BBL varieties with upright plant architecture and resistance to white and gray mold. Other needs include resistance to the root rot complex, improved seed quality, and tolerance to abiotic stresses including heat and moisture stress. The material developed by the OSU breeding program over the past five decades provides an excellent base population for continued improvement. While small acreages of other market types (European extra fine, wax and romano beans) are grown, the OSU breeding program will focus predominantly on full sieve green beans.

Breeding programs typically take about 10 years to develop a new variety. Winter nurseries and off-season greenhouse production can increase the number of generations per year and shorten the breeding cycle. New technologies, such as marker-assisted selection to introgress specific traits can also shorten the breeding process.

3.b OBJECTIVES

- Breed improved Bush Blue Lake green bean varieties with:
    - White and gray mold resistance
    - Improved plant architecture
    - High economic yield
    - Improved pod quality (including straightness, color, smoothness, texture, flavor and quality retention, and delayed seed size development)
    - Tolerance to abiotic stresses
- Improve seed quality of materials in the breeding program to provide greater resistance to mechanical injury and low germination issues.

3.c. SIGNIFICANT FINDINGS Two advanced green bean lines that combine productivity, quality, and white mold resistance were trialed again in 2014 and continue to appear promising. Seed of these lines have been provided to commercial seed companies for seed increase.

3.d. METHODS

Varietal Development: The program will continue with crosses among elite lines and the best white mold resistant lines. Pedigree and single seed descent breeding methods will be used to advance and select early generation materials. Green beans are a self-pollinated crop and cultivars are purelines that

developed through a minimum of six generations of self-pollination with selection. To initiate the process, selected lines are crossed in the greenhouse during the winter and the F1s are grown in the field to produce large F2 populations (target of 250 seeds per cross). F3s are then grown in the greenhouse or an off season winter nursery using a technique such as single seed descent (one seed is taken from each plant in the population and bulked). Selection is generally not conducted in the off season environment. The F4 is produced in the field in Oregon where selection for pod traits (length, cross-section, color, sieve size, smoothness, and straightness) and plant architecture is conducted. Similar selection is conducted in the F5 and selected plants are harvested as single plants (all the seed from one plant is composited). In the F6 and beyond, the populations are maintained as a collection of selected families (advanced lines). At this generation, there is sufficient seed for testing in various yield and disease trials.

Variety Trials: Two types of trials are conducted: preliminary trials where OSU advanced lines are evaluated and a commercial trial where lines submitted by commercial breeders are evaluated. Advanced lines are planted in plots consisting of a single 20-foot row from which 5-foot sections harvested one time (preliminary trial), or three times, two – three days apart (commercial trial). Lines are evaluated for growth habit, pod characteristics and T/A yield. Where the opportunity presents (disease is present), we will evaluate disease resistance. Graded samples are evaluated for pod smoothness, straightness, flavor, and color. These samples are frozen for later evaluation of the processed product. The commercial trial is open to all types of snap beans, but with an emphasis on entries comparable to blue lake beans. Samples from optimum harvest dates will be processed as above.

Advanced Lines: A breeding nursery consisting of lines at all stages of development are grown. Historic lines and those actively used commerce are evaluated each year and rogued for off types. Promising advanced lines undergo seed increase, rogueing, and initiation of sub-lines for varietal maintenance. Seed quality of OSU advanced lines will be quantified using germination damage tests that are standard in the industry. In short, seeds are dropped onto a steel plate, and then subjected to cold (10°C) germination tests.

The most promising lines near release are provided to seed companies for evaluation and increase. As these lines are increased, they will be tested in small-scale on-farm acreages.

Breeding for White Mold Resistance: Because of the urgent need for white mold resistant snap bean varieties, breeding for white mold resistance is the primary objective of the breeding program for the near future. Material with potential resistance is at various stages of development in the breeding program. Currently, the program is evaluating advanced lines developed using the NY6020 source of resistance. Additional lines in earlier generations with other sources of resistance are being advanced and selected for plant type and disease resistance.

Screening for resistance is laborious and restricted to advanced generations. This is because resistance is a quantitative trait and requires evaluation of replicated plant samples to obtain useful data. Two types of tests are used: the greenhouse based straw test where a plug of agar containing actively growing white mold mycelia is placed on a decapitated stem of a plant, and field trials where replicated plots are grown in a field with high risk of disease development with management to encourage disease.

3.e. RESULTS & DISCUSSION

Overview of Project and Varietal Development: Two events have reduced the size of the green bean breeding program. One was a 48% reduction in funding beginning in 2013 and continuing to present. The other was the discovery in 2013 of bacterial brown spot (*Pseudomonas syringae* pv. *syringae*) in entries entered into the commercial green bean trial. The disease was observed late in the season during harvest for processing evaluation. Brown spot can be seed borne and is considered a quarantinable disease in the seed production areas of the U.S. In the field, bacteria may be transported by water and wind into adjacent materials. In 2013, many lines in the breeding nursery were grown in close proximity to the commercial trial. We harvested seed from our breeding nursery in 2013 but because of concerns about spread of the disease, chose to use 2012 or older seed in 2014. We did have seed from many advanced lines from earlier years, but did not have many seed stocks for the early generation materials. As a consequence, most early generation materials were not planted in 2014 and the breeding nursery consisted of 207 lines rather than more than 1,000 that are normally grown. In 2014, brown spot was not observed in the breeding nursery or yield trials, but it was found and confirmed in a contracted green bean trial. The disease was present in one of three reps of 'Benton' (a cultivar known to be highly susceptible to brown spot). Seed used to plant the trial was Idaho grown and should not have been a source of disease. In both years, episodes of higher than normal humidity (associated with thunderstorm activity) occurred. Such conditions produce environmental conditions that favor reproduction of the bacteria and the development of disease symptoms. The organism causing brown spot is endemic to practically all bean growing environments; the organism will grow epiphytically but not cause symptoms until environmental conditions are favorable. Isolates from both 2013 and 2014 were sent to Bob Gilbertson, a plant pathologist at UC-Davis specializing in bacterial diseases of bean. He found that isolates from both years were genetically identical. Taken together, the evidence suggests that bacterial brown spot endemic, and that environmental conditions were favorable for symptom development.

In 2014, we conducted two yield and quality evaluation trials. It should be noted that the evaluation of commercial entries was funded entirely by fees from industry. One-hundred seventy-five advanced lines harvested in the field in 2013 were subjected to a drop test to determine resistance to mechanical and imbibitional injury prior to planting in 2014, with approximately 20 lines discarded for poor performance. Sixty advanced lines with putative white mold resistance were screened in the field. Stock seed increase and rogueing was conducted for four released cultivars and various advanced lines. There are a number of advanced selections that carry the NY6020 source of white mold resistance that are in or nearing field testing and processing phase of evaluation. The first of these was grown in preliminary trials in 2011 and approximately 1/3 of these with new additions were grown in the preliminary yield and quality trials conducted this year.

Yield Trials: The preliminary green bean yield and quality evaluation trial had 36 advanced experimental lines and six check cultivars (table 1, fig. 1). Three of the checks were commercial bush blue lake cultivars (OR 91G, OR 54, and OSU 5630), one was Sahara as a small sieve check, and two were checks with partial white mold resistance (Cornell 501 and NY 6020-5). All lines had been tested the previous year, and 25 had been tested during the prior two years. Four lines were classed as four or four to vie sieves with 75 – 90% 1-4 sieve pods at maturity while the remainder five or full sieve with percent 1-4 sieve ranging from 50-75%. The trial was planted on June 6 and was harvested 59 – 66 days later. Plots were harvested once at optimal maturity (although in some cases a second harvest was conducted if initial harvest was too young.

OR 54 was the highest yielding check with a yield of 13.7 T/A. Twenty nine lines had adjusted T/A yields that were not significantly different from OSU 5630. Three advanced lines were harvested too young and two were harvested too old. Two advanced lines of interest, 6771 and 6774, had yields of 8.5 and 9.7 T/A, respectively. Data on pod traits and notes from raw product evaluation are shown on table 2. Most lines exhibited good pod quality although some had short pods (6768, 6779, 6893, 6980, and 6993), one had heart cross section shape (6792), and several had pod color that might be too light upon processing (6905, 6973, 6999, 7013,7023, 7025, 7037, 7038, 7043, and 7044). Flavor characteristics for most fit a BBL profile (Table 2). Table 3 shows multiyear performance for advanced lines as well as a stability index. The stability index is calculated as the standard deviation across years divided by the mean and gives an indication of how widely the individual values from each year vary about the mean. Those lines with small stability index values are most stable. Among BBL checks, OR 54 OSU 5630, and OSU 6443 have high yields and are stable. OR 91G has relatively high yields but is less stable. Among experimental lines, a number have relatively high yields and are stable, including 6771 but not 6774.

Advanced lines considered for release: 6771 and 6774 have now been trialed for four years with performance shown in table 4. Average yields over seven trials have are similar to each other at 9.2 – 9.4 T/A and lower than the check cultivars. Yields seem to have been lowest in the commercial trials in 2012 and 2014. In 2014, the commercial trial had a strong gradient across the field apparently related to root rot disease. The gradient was perpendicular with the reps and therefore could not be accounted for statistically. All plots for the two advanced lines happened to be placed in parts of the field with highest disease incidence whereas the same was not true for the check cultivars, and this may account for the relatively poor performance in the 2014 commercial trial. Another consideration is white mold resistance and table 5 combines yield and stability data with white mold disease index. 6771 stands out as a line with relatively high yields, good stability and relatively good white mold resistance. 6774 shows lower yield, less stability and lower disease resistance. It should be noted, that both lines have significantly better disease resistance compared to the BBL checks (table 5, fig. 2). Pod quality of 6774 is superior to 6771, but in processing trials, we have judged 6771 to be acceptable. Seed of these lines has been provided to seed companies for increase.

One other advanced line that stands out in table 5 as having good yields, stability and disease resistance is 7025 and it will be scrutinized carefully for pod quality, and if found acceptable will be fast-tracked for seed increase.

Commercial Green Bean Trial: This trial was planted on June 24 and harvested 52 – 59 days later. The trial included seven five - full sieve green beans, and 16 two to four-five sieve green beans. Two full sieve and one 4 sieve check cultivars and two OSU experimental lines were included (tables 5 – 7, and figs. 3 -4). The check cultivars OR 91G and OSU 5630 were significantly higher yielding than any other line. Highest among the experimentals were CR-1220, SB4641, Huntington, OSU 6771, CR-1322 and SV1098GV. A wide range in yields were observed for the small sieve bean lines with the check Sahara having a yield of 6.6 T/A. The two-sieve cultivar Compass had a rather high yield of 6.0 T/A for an extra fine type.

Processing and Quality Evaluation of Experimental Green Beans: Experimental lines from the preliminary trial were sent to the OSU Pilot Plant for processing, along with 91G, OR54, and OSU 5630. In the Commercial Trial, all commercial lines along with OSU experimentals were processed and frozen along with the checks 91G, and OSU 5630.

Processed and frozen samples were evaluated by researchers 25 November, 2014. The commercial lines and some experimentals were then displayed in a cutting at the North West Food Processors Association Meetings in Portland in January, 2015. Data from the processed evaluations are currently being analyzed and will be reported at a later date. Though the data from the research evaluation does show how the new lines are doing and which crosses are the most promising, the low number of evaluators does not lead to statistically significant analyses of the results.

White Mold Resistance Breeding:
Because of limited seed available due to bacterial brown spot, a field screening trial was not conducted in 2014. Generation advance of breeding populations and new crosses made in the greenhouse during the winter of 2014 was conducted. In compensation for reduced funding from OPVC, we have begun conducting white mold screening for commercial companies on a fee per plot basis.

4. BUDGET DETAILS

1) Breeding (Myers)

Salaries and benefits	
Faculty Research Assistant	14,063
OPE @ 69%	9,695
Wages and benefits	
Student Wages	0
OPE @ 8%	0
Supplies	500
Travel	0
Plot Fees	0
Total	$24,258

2) Processing Evaluation (Yorgey)

Salaries and benefits	
Senior Faculty Research Assistant	2,547
OPE @ 60%	1,528
Wages and benefits	
Student wages	1,300
OPE (@ 8%	104
Supplies	1,344
Total	$6,823

Grand Total **$31,081**

Budget Justification: Salary and OPE is requested for a full time faculty research assistant who will commit approximately a half their time to green bean breeding The remainder of salary will come from other sources with total projected salary of $37,284 + 22,575 OPE (61%) = $59,859. For the senior faculty research assistant, approximately 0.1 FTE will be required to process entries from green bean trials; the remainder of salary to come from other sources. Undergraduate student wages of $7,000 and $2,600 are requested for the breeding and processing programs, respectively with 8% OPE. Funds for services and supplies for the breeding program covers land use fee (2 hectares at $2800/ha = $4,800), greenhouse fee (1,000 sq. ft. at $1.55/ sq. ft. = $1,550) and $1,000 to cover vehicle transport between campus and the farm, and various materials used for plot work.

Table 1. Performance of advanced green bean lines in a preliminary yield trial, OSU Vegetable Research Farm, Jun 6 planting, Corvallis, 2014.[z]

Line	Days to Harvest	Est. Sieve Size	Stand	Percent Sieve Size[y]						%1-4 Sieve	Av Tons/Acre	Av Adj Tons/Acre[x]
				1.0	2.0	3.0	4.0	5.0	6.0			
OR 91G	59	6	169	10.1	12.8	13.8	23.9	33.0	6.4	60.6	6.5	7.2
OR54	63	6	170	5.0	9.4	16.3	28.2	33.2	7.9	58.9	12.5	13.7
Cornell 501	66	4-5	170	2.6	4.3	10.3	34.2	44.4	4.3	51.3	7.8	7.8
NY6020-5	63	5	166	3.6	3.6	5.4	10.7	41.1	35.7	23.2	3.8	2.8
Sahara	62	4	142	4.6	13.1	32.7	47.7	2.0	0.0	98.0	9.5	9.5
OSU 5630	61	6	170	6.1	7.3	12.7	30.3	40.6	3.0	56.4	10.2	10.9
6443	63	6	170	4.6	7.7	12.8	24.5	38.3	12.2	49.5	12.1	12.0
6768	66	5	170	3.5	4.9	9.9	30.3	44.4	7.0	48.6	9.2	9.1
6770	62	6+	168	4.2	4.9	9.8	17.5	32.9	30.8	36.4	9.4	8.1
6771	59	5	170	2.8	7.4	15.7	43.5	29.6	0.9	69.4	7.1	8.5
6772	61	6	170	2.0	4.1	13.6	44.9	34.7	0.7	64.6	9.5	10.9
6773	59	6	170	7.6	8.4	12.6	21.8	30.3	19.3	50.4	7.8	7.9
6774	62	6	170	2.5	4.9	11.1	28.4	43.2	9.9	46.9	10.0	9.7
6779	63	5	170	2.1	4.9	10.5	32.9	47.6	2.1	50.3	9.1	9.2
6792	63	5	170	1.6	3.1	10.1	38.0	46.5	0.8	52.7	8.4	8.7
6835	61	6	170	3.8	4.9	12.0	36.1	40.4	2.7	56.8	11.3	12.1
6866	62	6	170	1.8	1.8	6.1	21.1	48.2	21.1	30.7	6.9	5.6
6886	59	5	170	2.4	7.1	14.3	38.1	35.7	2.4	61.9	5.7	6.4
6893	66	4	170	1.9	2.5	8.1	25.6	53.1	8.8	38.1	9.8	8.0
6900	62	5	170	2.5	5.0	8.3	36.4	45.5	2.5	52.1	7.8	8.0
6905	62	5-6	170	2.5	3.7	9.8	39.3	40.5	4.3	55.2	10.0	10.5
6909	61	6	170	1.5	3.0	7.5	29.9	51.5	6.7	41.8	8.3	7.6
6937	63	6	170	6.0	8.3	16.5	31.6	33.8	3.8	62.4	8.0	9.0
6973	61	6	170	0.7	2.8	12.8	41.1	41.1	1.4	57.4	8.9	9.6
6978	63	6	170	2.7	6.0	13.3	28.7	35.3	14.0	50.7	9.8	9.9
6980	66	5	170	1.1	2.1	6.3	28.0	56.1	6.3	37.6	11.9	10.4
6986	66	5	152	4.4	7.8	16.1	36.7	32.2	2.8	65.0	10.9	12.5
6988	66	6	170	3.4	5.6	15.8	43.5	31.1	0.6	68.4	10.9	12.9
6992	63	4	170	2.0	5.3	14.0	58.7	20.0	0.0	80.0	9.4	9.4

Table 1. (continued)

Line	Days to Harvest	Est. Sieve Size	Stand	Percent Sieve Size[y] 1.0	2.0	3.0	4.0	5.0	6.0	%1-4 Sieve	Av Tons/Acre	Av Adj Tons/Acre[x]
6993	63	4	170	4.4	11.4	32.0	32.0	20.2	0.0	79.8	9.9	9.9
6996	63	6	170	2.9	4.1	12.9	32.2	42.1	5.8	52.0	10.5	10.7
6999	63	6	170	3.5	7.9	13.2	32.5	38.6	4.4	57.0	6.8	7.3
7005	66	6	170	5.4	10.1	20.8	35.6	25.5	2.7	71.8	9.5	11.5
7013	66	5	170	7.2	10.4	20.0	32.0	24.8	5.6	69.6	8.2	9.8
7018	66	6	170	1.4	3.4	8.2	32.7	40.8	13.6	45.6	9.2	8.8
7022	63	5	170	2.6	7.1	19.4	43.2	27.1	0.6	72.3	9.4	11.4
7023	61	4-5	170	4.4	10.3	23.5	44.9	16.9	0.0	83.1	8.5	8.5
7025	63	5	170	2.4	4.8	11.4	39.2	42.2	0.0	57.8	10.3	11.1
7037	63	6	159	3.0	3.0	6.6	28.4	55.8	3.0	41.1	12.7	11.5
7038	63	5	170	6.2	11.7	22.8	48.1	11.1	0.0	88.9	9.9	13.7
7042	66	5	150	6.3	8.7	17.5	30.2	33.3	4.0	62.7	7.8	8.8
7043	63	5	142	6.8	9.8	20.5	31.8	29.5	1.5	68.9	8.3	9.9
7044	62	5-6	161	3.6	7.2	18.0	31.5	35.1	4.5	60.4	7.2	7.9
LSD 0.05											2.4	2.6

[z]Mean of 3 replications; subplots of 5' were harvested from 18' plots in rows 30" apart. [y]Percent calculated as % of total of 1-6 sieve beans.
[x]Tons/Acre adjusted to 50% 1-4 sieve for full and 5 sieve beans; yields for smaller sieve lines were not adjusted.

Table 2. Notes on preliminary green bean lines, June 6 planting, OSU Vegetable Research Farm, Corvallis, 2014.

						Flavor[z]			
Entry	Pod Length (cm)	Pod Straight-ness[z]	Pod Cross Section[y]	Pod Smooth-ness[z]	Pod Color[x]	Sweet-ness	Astrin-gency	Perfumi-ness	Notes[w]
OR 91G	18	5	h-r	4	5	7	7	1	Oval tendency in smaller sieve sizes in this trial. RC.
OR54	16	5	r	7	4	7	8	1	
NY6020-5	13	7	r	7	6	7	5	5	
Sahara	15	8	r-cb	5	6	5	5	3	5 sv pods somewhat bumpy although seed development is minimal.
OSU 5630	15	5	r	5	5	5	8	1	
6443	18	7	r	7	5	5	7	1	
6768	12	9	r	7	5	8	5	1	Nice looking bean although may be short for 5 sv.
6770	21	2	r	5	5	5	7	1	Pods too long and very curved.
6771	14	7	r-cb	7	5	6	8	1	Short but attractive looking bean.
6772	14	5	r-cb	7	5	7	7	1	
6773	17	5	r-cb	6	5	7	8	1	Very long pods somewhat curved in higher sieve sizes. Some battering in the grader due to pod length.
6774	17	6	r	5	7	5	8	1	Somewhat bumpy pods esp in 5 & 6 sv, flat in 4 sv.
6779	13	8	r	5	6	5	8	1	Can be pushed to 50% 1-4 sv, but better as a 5 sv.
6792	16	9	h	9	5	5	5	1	Mostly heart cross section but a few round - may be able to select round sps. Very smooth and straight but doesn't seem to be particularly high fiber.
6835	17	7	r	7	5	7	8	1	Long relatively straight pods; moderately seedy 6 sv, beginning in 5sv.
6866	17	8	r	5	5	7	7	1	Tough skin which may influence straightness. Pods somewhat bumpy.

Table 2. (continued)

							Flavor[z]		
Entry	Pod Length (cm)	Pod Straight-ness[z]	Pod Cross Section[y]	Pod Smooth-ness[z]	Pod Color[x]	Sweet-ness	Astrin-gency	Perfumi-ness	Notes[w]
6886	12	7	r-cb	7	6	5	7	1	Six sieve is curved and junky, some blanking in all sieve sizes. Mixed development in this line in this trial.
6893	13	7	r	1	6	4	7	1	Missed this one. Very bumpy but otherwise nice.
6900	15	7	r	5	5	7	8	1	A bit over mature compared to other lines.
6905	17	4	r-cb	7	4	5	7	1	Very attractive long pods; good yields and wm tolerance overall a very nice bean.
6909	16	4	r	7	5	9	8	1	Long attractive pods, some slightly curved & heart shaped. One light colored OT.
6937	16	5	r	7	6	5	7	1	Attractive dark green long pods with slight curve.
6973	14	7	o-r	3	4	7	5	1	Tough skin, oval tendency, bumpy pods even in smaller sieve sizes.
6978	16	8	r	7	6	5	7	1	Shiny pods and fairly straight. May be variable for round-heart. Color mix in plot.
6980	12	9	r	7	6	7	5	5	Very short pods for its sieve size. It can harvested at 50% 1-4 sv without loss of quality. Very concentrated set.
6986	14	5	r	7	6	7	8	1	Not the straightest but an attractive bean.
6988	15	5	r	5	5	7	7	1	---
6992	15	8	r-cb	9	5	5	7	5	Nice 4 sv, not as dark as 6993 but acceptable.
6993	13	8	r	5	7	7	7	1	VERY attractive 4 sv - uniform with dark green pods.
6996	16	4	r	7	5	3	7	1	Systematic curve and color may be light, but otherwise a nice bean.
6999	14	7	r	7	4	7	7	3	Some short and junky pods.

Table 2. (continued)

						Flavor[z]			
Entry	Pod Length (cm)	Pod Straight-ness[z]	Pod Cross Section[y]	Pod Smooth-ness[z]	Pod Color[x]	Sweet-ness	Astrin-gency	Perfumi-ness	Notes[w]
7013	16	4	r-cb	5	4	9	7	1	Probably too light but very sweet.
7018	15	3	r	3	5	3	7	1	Significant flat mix in this line affecting all sieve size except 6.
7022	14	4	h-r	5	5	9	7	1	Color may be too light, lots of polywogs and junky pods.
7023	14	4-5	r	8	4	7	8	1	---
7025	14	3	h	5	4	7	7	1	Hook shaped pods, may be too light color.
7037	16	4	r	4	4	7	7	1	May be too light color. Very concentrated set.
7038	15	3	r	5	3	7	5	7	Too light and many crooked pods particularly in smaller sieves. Picked a day or two early.
7042	15	1	r	4	5	7	8	1	Very curly, fish hooky pods.
7043	16	1	r	5	4	7	7	1	Pods very curly esp in 3 & 4sv. Color is light.
7044	15	5	r	4	3	7	8	1	Pods somewhat curved, very light in color.

[z]Scale of 1 - 9 where 1 is least or worst and 9 is most or best. [y]Cross section: r = round, h = heart, cb = crease-back. [y]Scores based on a 1 - 9 scale with 9 darkest. Standard BBL color is rated as 5. [w]RC: reverse curve; sv: sieve; wm: white mold; OT: off type; polywog: short one seeded pod.

Table 3. Yield of OSU experimental green bean lines grown at the Vegetable research farm from 2012 - 2014. Checks are indicated by shading.

Line	2012	2013	2014	Ave adj T/A over years	Stability Index[z]
	Average adjusted T/A				
6443	14.3	11.0	12.0	12.4	0.14
OR54	11.8	11.3	13.7	12.3	0.10
OSU 5630	13.6	11.4	10.9	12.0	0.12
7038		8.9	13.7	11.3	0.30
6772	10.7	11.1	10.9	10.9	0.02
7005		9.9	11.5	10.7	0.11
6978	13.0	8.8	9.9	10.6	0.21
7037		9.5	11.5	10.5	0.14
7025		9.7	11.1	10.4	0.10
6835	9.6	9.0	12.1	10.2	0.16
6996	11.5	8.4	10.7	10.2	0.16
OR 91G	12.3	10.7	7.2	10.1	0.26
6973	10.5	9.9	9.6	10.0	0.05
OSU 6771	11.1	10.5	8.5	10.0	0.14
7013		9.9	9.8	9.8	0.01
6905	9.0	9.6	10.5	9.7	0.08
7043		8.7	9.9	9.3	0.09
6988	10.5	4.2	12.9	9.2	0.49
7023		7.0	11.2	9.1	0.32
6773	10.1	9.2	7.9	9.1	0.12
6993	9.4	7.0	10.7	9.0	0.20
6986	8.9	5.6	12.5	9.0	0.38
7022		6.4	11.4	8.9	0.39
6937	10.1	7.6	9.0	8.9	0.14
OSU 6774[y]	7.0	9.9	9.7	8.9	0.18
6992	8.6	7.8	9.9	8.8	0.12
6900	9.1	9.1	8.0	8.7	0.07
6980	9.3	6.0	10.4	8.6	0.27
6779	8.4	7.9	9.2	8.5	0.07
6770	9.3	7.9	8.1	8.5	0.09
6768	9.2	7.1	9.1	8.5	0.14
6909	10.3	7.4	7.6	8.4	0.19
7044		8.9	7.9	8.4	0.08
6792	7.9	7.9	8.7	8.2	0.05
Cornell 501	8.6	7.2	7.8	7.8	0.09
7018		5.9	8.8	7.3	0.27
6893	8.3	5.6	8.0	7.3	0.20
6866	10.0	5.6	5.6	7.1	0.36
6886	8.4	6.3	6.4	7.0	0.17
7042		5.0	8.8	6.9	0.39

Table 3. (continued)

Line	2012	2013	2014	Ave adj T/A over years	Stability Index[z]
	Average adjusted T/A				
6999		5.6	7.3	6.5	0.18
NY6020-5	4.0	2.8	2.8	3.2	0.22
LSD 0.05	2.4	1.9	2.6		

[z]Stability index calculated as the standard deviation divided by the mean; the smaller the number, the more stable the line - those lines <0.15 are most stable. [y]Data for 2012 from the commercial bean trial.

Table 4. Average adjusted T/A for elite green bean lines and checks from 2011 to 2014 grown at the Vegetable Research Farm.

Entry	2011	2012		2013		2014		6771	6774
	YT1	YT1	Comm	YT1	Comm	YT1	Comm	Ave	Ave
	adj T/A								
OSU 5630	13.9	13.6	10.1	11.4	13.0	10.9	9.9	11.9	11.5
OR 91G	13.4	12.3	8.3	10.7	13.1	7.2	12.4	11.2	10.9
6771	9.6	11.1		10.5		8.5	7.2	9.4	
6774	11.9		7.0	9.9	9.6	9.7	6.9		9.2
LSD 0.05	2.5	1.8	1.8	1.9	1.9	2.6	1.4		

Table 5. Comparison of yield and stability over years and white mold disease index from 2013 for experimental green bean lines and checks grown in trials at the OSU Vegetable Research Farm.

Line	T/A[z]	Stability Index[y]	Disease Index[x]	Line	T/A[z]	Stability Index[y]	Disease Index[x]
6993	9.0	0.20	50	7043	9.3	0.09	79
NY6020-5	3.2	0.22	53	6988	9.2	0.49	81
6792	8.2	0.05	60	6768	8.5	0.14	81
6986	9.0	0.38	60	6835	10.2	0.16	81
6992	8.8	0.12	60	7005	10.7	0.11	81
6893	7.3	0.20	62	7042	6.9	0.39	81
7025	10.4	0.10	66	6973	10.0	0.05	84
6779	8.5	0.07	66	6905	9.7	0.08	84
6980	8.6	0.27	68	7037	10.5	0.14	84
7022	8.9	0.39	69	6978	10.6	0.21	86
6886	7.0	0.17	70	6866	7.1	0.36	86
6771	10.0	0.14	71	7018	7.3	0.27	86
6900	8.7	0.07	72	7044	8.4	0.08	86
6999	6.5	0.18	72	6772	10.9	0.02	88
6770	8.5	0.09	74	6909	8.4	0.19	88
6937	8.9	0.14	74	6773	9.1	0.12	90
6774	8.9	0.18	75	OR 54	12.3	0.10	92
7023	9.1	0.32	77	OSU 6443	12.4	0.14	92
6996	10.2	0.16	79	OR 91G	10.1	0.26	96
7038	11.3	0.30	79	OSU 5630	12.0	0.12	98
LSD 0.05			14	LSD 0.05			14

[z]Adjusted average T/A from 2012 - 2014. Some entries have only two years of data (see Table 3). [y]Stability index calculated as standard deviation/mean as shown in table 3. [x]White mold disease index (geometric mean of % incidence and severity) from field trials conducted in 2013. Lines with smaller numbers are more resistant.

Table 6. Performance of commercial green bean varieties, June 24 planting, OSU Vegetable Research Farm, Corvallis, 2014.

					Percent Sieve Size[z]						Tons/Acre Sieve Size						
Cultivar	Source	AV Stand	Sieve size	Days	1	2	3	4	5	6	1-4	1.0	2.0	3.0	4.0	5.0	6.0	Graded Total[y]
OR 91G*	OSU (ck)	150	6	55	6.3	8.5	14.3	32.8	34.4	3.7	61.9	0.7	0.9	1.6	3.6	3.8	0.4	11.0
OR 91G					2.5	2.5	7.0	23.8	54.1	10.2	35.7	0.3	0.3	1.0	3.4	7.7	1.5	14.2
OSU 5630	OSU (ck)	150	6	57	7.7	9.9	22.0	45.1	15.4	0.0	84.6	0.8	1.0	2.3	4.8	1.6	0.0	10.6
OSU 5630*					3.8	4.8	10.5	36.2	42.9	1.9	55.2	0.5	0.6	1.3	4.4	5.2	0.2	12.2
OSU 6771	OSU	150	5-6	58	2.7	5.5	13.0	52.1	26.7	0.0	73.3	0.2	0.5	1.1	4.4	2.3	0.0	8.5
OSU 6771*					1.1	2.3	6.8	25.4	60.5	4.0	35.6	0.1	0.2	0.7	2.6	6.2	0.4	10.3
OSU 6774	OSU	116	6	59	9.3	11.0	19.5	31.4	23.7	5.1	71.2	0.6	0.8	1.3	2.1	1.6	0.3	6.9
OSU 6774*					5.6	7.0	12.6	25.9	37.8	11.2	51.0	0.5	0.6	1.0	2.1	3.1	0.9	8.3
5060*	Pureline	150	5	55	10.5	13.1	24.2	35.9	15.7	0.7	83.7	0.9	1.2	2.1	3.2	1.4	0.1	8.9
5060					4.3	3.9	12.6	33.8	40.6	4.8	54.6	0.5	0.5	1.5	4.1	4.9	0.6	12.0
5060					3.5	4.5	10.6	32.8	42.9	5.6	51.5	0.4	0.5	1.2	3.8	4.9	0.6	11.5
7343	Pureline	150	4-5	57	11.2	17.2	46.3	24.6	0.7	0.0	99.3	0.9	1.3	3.6	1.9	0.1	0.0	7.8
7343*					3.0	6.1	41.2	49.1	0.6	0.0	99.4	0.3	0.6	3.9	4.7	0.1	0.0	9.6
7343					3.1	4.6	28.1	60.7	3.6	0.0	96.4	0.3	0.5	3.2	6.9	0.4	0.0	11.4
7396	Pureline	150	3	56	21.5	47.9	29.8	0.8	0.0	0.0	100.0	1.5	3.4	2.1	0.1	0.0	0.0	7.0
7396*					12.4	35.3	46.4	5.9	0.0	0.0	100.0	1.1	3.1	4.1	0.5	0.0	0.0	8.9
7396					8.7	25.0	54.3	12.0	0.0	0.0	100.0	0.9	2.7	5.8	1.3	0.0	0.0	10.7
7450	Pureline	149	4	52	16.4	16.4	23.6	32.7	10.9	0.0	89.1	0.5	0.5	0.8	1.0	0.3	0.0	3.2
7450*					18.5	15.4	20.0	38.5	7.7	0.0	92.3	0.7	0.6	0.8	1.5	0.3	0.0	3.8
7450					7.7	10.8	20.0	41.5	19.2	0.8	80.0	0.6	0.8	1.5	3.1	1.5	0.1	7.6
F19	Pureline	150	3-4	55	20.2	22.5	23.6	32.6	1.1	0.0	98.9	1.0	1.2	1.2	1.7	0.1	0.0	5.2
F19*					7.4	13.3	36.3	37.8	5.2	0.0	94.8	0.6	1.0	2.8	3.0	0.4	0.0	7.8
F19					4.2	5.6	21.0	60.8	8.4	0.0	91.6	0.3	0.5	1.7	5.1	0.7	0.0	8.3
GB1000	Pureline	148	4	52	25.8	25.8	19.4	25.8	3.2	0.0	96.8	0.5	0.5	0.3	0.5	0.1	0.0	1.8
GB1000*					12.2	22.4	20.4	36.7	8.2	0.0	91.8	0.3	0.6	0.6	1.0	0.2	0.0	2.8
GB1000					5.9	7.8	17.6	51.0	17.6	0.0	82.4	0.3	0.5	1.0	3.0	1.0	0.0	5.9
2011B516	Brotherton	150	3	57	15.6	32.1	38.5	13.8	0.0	0.0	100.0	1.0	2.0	2.4	0.9	0.0	0.0	6.3
2011B516*					6.9	15.0	38.2	39.3	0.6	0.0	99.4	0.7	1.5	3.8	3.9	0.1	0.0	10.0
2011B516					4.9	9.3	31.2	53.7	1.0	0.0	99.0	0.6	1.1	3.7	6.4	0.1	0.0	11.9

Table 6. (continued)

Cultivar	Source	AV Stand	Sieve size	Days	Percent Sieve Size[z]						Tons/Acre Sieve Size						Graded Total[y]
					1	2	3	4	5	6	1-4	1.0	2.0	3.0	4.0	5.0	6.0	
2012B463	Brotherton	150	4	55	8.5	17.1	33.3	41.0	0.0	0.0	100.0	0.6	1.2	2.3	2.8	0.0	0.0	6.8
2012B463*					4.0	8.7	31.5	53.7	2.0	0.0	98.0	0.3	0.8	2.7	4.6	0.2	0.0	8.7
2012B463					1.7	3.5	22.7	62.8	9.3	0.0	90.7	0.2	0.3	2.3	6.3	0.9	0.0	10.0
2012B512	Brotherton	150	4	57	14.3	21.8	45.1	18.0	0.8	0.0	99.2	1.1	1.7	3.5	1.4	0.1	0.0	7.7
2012B512*					8.9	13.3	35.4	39.9	2.5	0.0	97.5	0.8	1.2	3.3	3.7	0.2	0.0	9.2
2012B512					3.6	7.6	28.9	53.8	6.1	0.0	93.9	0.4	0.9	3.3	6.2	0.7	0.0	11.4
2012B522	Brotherton	150	4	57	8.8	20.4	48.2	21.9	0.7	0.0	99.3	0.7	1.6	3.8	1.7	0.1	0.0	8.0
2012B522*					3.2	6.8	36.3	50.5	3.2	0.0	96.8	0.3	0.8	4.0	5.6	0.3	0.0	11.0
2012B522					1.5	4.9	30.9	57.8	4.9	0.0	95.1	0.2	0.6	3.7	6.9	0.6	0.0	11.8
COMPASS	Brotherton	150	2	57	59.2	40.8	0.0	0.0	0.0	0.0	100.0	4.3	3.0	0.0	0.0	0.0	0.0	7.3
COMPASS*					39.4	60.6	0.0	0.0	0.0	0.0	100.0	3.0	4.6	0.0	0.0	0.0	0.0	7.7
COMPASS					31.0	69.0	0.0	0.0	0.0	0.0	100.0	2.8	6.2	0.0	0.0	0.0	0.0	9.0
DW630	Brotherton	150	3	57	23.1	55.8	20.2	1.0	0.0	0.0	100.0	1.4	3.4	1.2	0.1	0.0	0.0	6.0
DW630*					9.5	50.4	39.4	0.7	0.0	0.0	100.0	0.8	4.0	3.1	0.1	0.0	0.0	8.0
DW630					8.2	42.2	49.0	0.7	0.0	0.0	100.0	0.7	3.6	4.2	0.1	0.0	0.0	8.5
CR-1114	Crites		4-5	53	15.9	18.8	23.2	31.9	10.1	0.0	89.9	0.6	0.8	0.9	1.3	0.4	0.0	4.0
CR-1114*					7.8	12.2	20.0	40.0	19.1	0.9	80.0	0.5	0.8	1.3	2.7	1.3	0.1	6.7
CR-1114					5.5	7.6	20.0	38.6	26.2	2.1	71.7	0.5	0.6	1.7	3.3	2.2	0.2	8.4
CR-1218	Crites	140	5	53	8.4	12.0	25.3	44.6	9.6	0.0	90.4	0.4	0.6	1.2	2.1	0.5	0.0	4.8
CR-1218*					3.6	5.0	12.2	39.6	38.8	0.7	60.4	0.3	0.4	1.0	3.2	3.1	0.1	8.1
CR-1218					1.3	1.9	9.4	48.8	37.5	1.3	61.3	0.1	0.2	0.9	4.5	3.5	0.1	9.3
CR-1220	Crites	150	5	57	6.6	9.5	24.1	46.7	13.1	0.0	86.9	0.5	0.8	1.9	3.7	1.0	0.0	8.0
CR-1220*					2.7	4.3	11.8	41.4	37.6	2.2	60.2	0.3	0.5	1.3	4.5	4.1	0.2	10.8
CR-1220					1.8	2.7	5.4	30.8	52.0	7.2	40.7	0.2	0.3	0.7	3.9	6.7	0.9	12.8
CR-1322	Crites	150	5	57	10.5	13.7	23.4	41.1	11.3	0.0	88.7	0.8	1.0	1.7	3.0	0.8	0.0	7.2
CR-1322*					5.2	6.5	13.6	37.7	35.1	1.9	63.0	0.5	0.6	1.2	3.4	3.1	0.2	8.9
CR-1322					3.5	3.5	9.0	36.0	44.5	3.5	52.0	0.4	0.4	1.0	4.2	5.2	0.4	11.6
Sahara	HM	126	4	56	9.1	13.6	51.8	24.5	0.9	0.0	99.1	0.6	0.9	3.3	1.6	0.1	0.0	6.4
Sahara*					6.3	9.8	32.9	49.7	1.4	0.0	98.6	0.5	0.8	2.7	4.1	0.1	0.0	8.3

Table 6. (continued)

Cultivar	Source	AV Stand	Sieve size	Days	Percent Sieve Size[z]						Tons/Acre Sieve Size						Graded Total[y]
					1	2	3	4	5	6	1-4	1.0	2.0	3.0	4.0	5.0	6.0	
Sahara					3.4	4.0	14.9	65.7	12.0	0.0	88.0	0.3	0.4	1.5	6.7	1.2	0.0	10.2
Ambition	Syngenta	150	4	55	9.8	15.4	32.5	39.0	3.3	0.0	96.7	0.7	1.1	2.3	2.8	0.2	0.0	7.1
Ambition*					6.2	9.3	30.9	46.9	6.8	0.0	93.2	0.6	0.9	2.9	4.4	0.6	0.0	9.4
Ambition					2.0	4.1	18.4	61.7	13.8	0.0	86.2	0.2	0.5	2.1	7.0	1.6	0.0	11.4
Huntington	Syngenta	150	5-6	57	8.8	13.8	22.5	36.3	18.1	0.6	81.3	0.8	1.3	2.1	3.4	1.7	0.1	9.3
Huntington*					4.4	7.1	12.0	31.1	40.4	4.9	54.6	0.5	0.8	1.3	3.3	4.3	0.5	10.6
Pismo	Syngenta	150	4-5	55	17.1	23.1	27.4	27.4	5.1	0.0	94.9	1.2	1.6	1.9	1.9	0.3	0.0	6.8
Pismo*					8.0	13.1	25.0	42.0	11.9	0.0	88.1	0.8	1.3	2.6	4.3	1.2	0.0	10.2
Pismo					3.4	5.1	12.7	37.7	39.4	1.7	58.9	0.5	0.7	1.7	5.2	5.4	0.2	13.7
SB4641	Syngenta	150	5	55	17.4	18.3	23.9	34.9	5.5	0.0	94.5	1.1	1.2	1.5	2.2	0.3	0.0	6.3
SB4641*					5.1	9.2	25.6	46.7	13.3	0.0	86.7	0.6	1.0	2.9	5.3	1.5	0.0	11.3
SB4641					2.8	3.7	12.1	50.5	30.4	0.5	69.2	0.3	0.5	1.5	6.3	3.8	0.1	12.4
SB4644	Syngenta	150	4-5	52	15.0	18.1	22.0	29.9	15.0	0.0	85.0	1.1	1.3	1.6	2.2	1.1	0.0	7.4
SB4644*					9.4	11.8	19.4	34.1	25.3	0.0	74.7	0.9	1.2	1.9	3.4	2.5	0.0	9.9
SB4644					4.7	11.0	16.5	41.1	26.3	0.4	73.3	0.6	1.5	2.3	5.6	3.6	0.1	13.7
SV1098GV	Seminis	150	5	55	8.5	13.2	20.8	35.8	21.7	0.0	78.3	0.5	0.8	1.3	2.2	1.3	0.0	6.2
SV1098GV*					1.4	2.2	64.2	17.3	14.0	0.8	85.2	0.3	0.5	13.4	3.6	2.9	0.2	20.8
SV1098GV					0.9	0.9	3.2	16.3	58.4	20.4	21.3	0.1	0.1	0.4	2.1	7.5	2.6	12.8
Sybaris	Seminis	150	4	57	9.4	17.4	36.2	35.5	1.4	0.0	98.6	0.8	1.4	2.9	2.8	0.1	0.0	8.0
Sybaris*					3.6	7.2	19.8	62.3	7.2	0.0	92.8	0.3	0.7	1.9	6.0	0.7	0.0	9.7
Sybaris					3.1	4.7	16.1	62.2	14.0	0.0	86.0	0.3	0.5	1.8	7.0	1.6	0.0	11.2

[z]Percent calculated as % of total of 1-6 sieve beans. [y]Total tons/acre of the graded beans, including sieve sizes 1-6. *Harvested for processing.

Table 7. Statistical comparison of yields of commercial green bean lines, Corvallis, 2014[z].

Cultivar	Sieve size	T/A Unadjusted	T/A Adjusted[y]
OR 91G	6	11.1	12.4
OSU 5630	6	9.5	9.9
OSU 6771	5-6	8.4	7.2
OSU 6774	6	6.8	6.9
5060	5	7.0	9.4
7343	4-5	7.7	7.7
7396	3	7.0	7.0
7450	4	3.2	3.2
F19	3-4	6.2	6.2
GB1000	4	2.7	2.7
2011B516	3	8.0	8.0
2012B463	4	7.0	7.0
2012B512	4	7.3	7.3
2012B522	4	8.6	8.6
COMPASS	2	6.0	6.0
DW630	3	6.3	6.3
CR-1114	4-5	5.6	5.6
CR-1218	5	6.5	7.2
CR-1220	5	9.0	9.9
CR-1322	5	7.4	8.4
Sahara	4	6.6	6.6
Ambition	4	7.6	7.6
Huntington	5-6	8.6	9.0
Pismo	4-5	8.2	8.2
SB4641	5	8.9	12.1
SB4644	4-5	7.8	7.8
SV1098GV	5	7.1	9.6
Sybaris	4	7.5	7.5
LSD 0.05		1.3	1.4

[z]Based on one selected harvest for each variety (marked with * on Table 3), which was usually the harvest closest to optimal based on that variety's intended use (50% 1-4 sieve for full sieve). Yields are field yields of 1-6 sieve beans. [y]Full (5 and 6) sieve beans were adjusted to 50% 1-4 sieve; all others were unadjusted.

Table 8. Notes on June 24 commercial bean trial, OSU Vegetable Research Farm, Corvallis, Oregon, 2014.

Line	Pod Length (cm)	Pod Straight-ness[z]	Pod Cross Section[y]	Pod Smooth-ness[z]	Pod Color[x]	Flavor[z]			Notes[w]
						Sweet-ness	Astrin-gency	Perfumi-ness	
OR 91G	17	5	r	5	5	7	7	1	---
5060	13	4	r	7	5	5	7	1	Short podded BBL type. Hooked pods in smaller sieves - possibly response to heat. Also has an oval/flat mix in smaller sieves.
OSU 5630	15	5	r	5	5	7	7	1	---
OSU 6771	13	7	r-cb	7	5	7	8	1	---
OSU 6774	16	4	r	5	6	5	8	1	Very attractive dark green BBL type with long pods.
7343	12	5	h	9	6	9	5	5	May have an oval tendency.
7396	11	5	r	7	5	7	7	1	---
7450	12.5	8	o-h-r	5	5	7	3	5	Wax bean with good color. Mix of pod shapes - some oval, some heart, and some round.
2011B516	13	8	r	9	7	7	5	3	---
2012B463	12.5	6	r	7	3	7	5	1	---
2012B512	15	8	o-r	9	4	7	1	5	Long slender mostly oval w/ few round pods. Some pt strings.
2012B522	14.5	9	o-h	9	5	5	3	5	Line has an oval tendency perhaps more pronounced in this trial - otherwise long slender straight bean.
Ambition	14	8	r	8	7	7	5	1	Attractive pods - straight & uniform with good color.
COMPASS	12.5	6	r	9	5	3	3	9	Attractive bean w/ different flavor profile. Pods a bit tough as is typical of extra fine types.

Table 8. (continued)

Line	Pod Length (cm)	Pod Straight-ness[z]	Pod Cross Section[y]	Pod Smooth-ness[z]	Pod Color[x]	Flavor[z]			Notes[w]
						Sweet-ness	Astrin-gency	Perfumi-ness	
CR-1114	13	7	r	6	4	7	5	1	Long spurs; many blanks and junky pods in 3 sv.
CR-1218	12	7	r	7	4	7	7	1	Many spent flower blossoms attached to pods - may be more prone to white mold as a result.
CR-1220	13	6	r	7	6	7	3	9	Attractive bean with RC.
CR-1322	12	6	r	7	5	5	3	7	Oval mix.
DW630	11.5	9	r	7	5	5	7	3	Bright colored wax bean. Possibly a green podded mix.
F19	13	7	r	5	5	1	5	7	Oval tendency esp smaller sieve sizes.
GB1000	11	7	r	9	7	3	7	5	Very attractive pc type. Split set.
Huntington	15	6	r-cb	7	4	7	3	1	---
Pismo	13.5	6	r	7	4	7	3	1	Some battering in the grader.
Sahara	13.5	8	r	7	6	7	5	3	---
SB4641	14.5	7	r	8	4	7	3	5	---
SB4644	13	8	r	7	5	7	8	3	Need to check color against BBL type.
SV1098GV	14	5	r	8	6	3	7	3	Attractive pc type.
Sybaris	13.5	6	r	7	7	7	5	3	Nice colored bean but a bit curvy. May have EZ pick trait.

[z]Scale of 1 - 9 where 1 is least or worst and 9 is most or best. [y]Cross section: r = round, h = heart, cb = crease-back. [x]Scores based on a 1 - 9 scale with 9 darkest. Standard BBL color is rated as 5. [w]BBL: bush blue lake; RC: reverse curve.

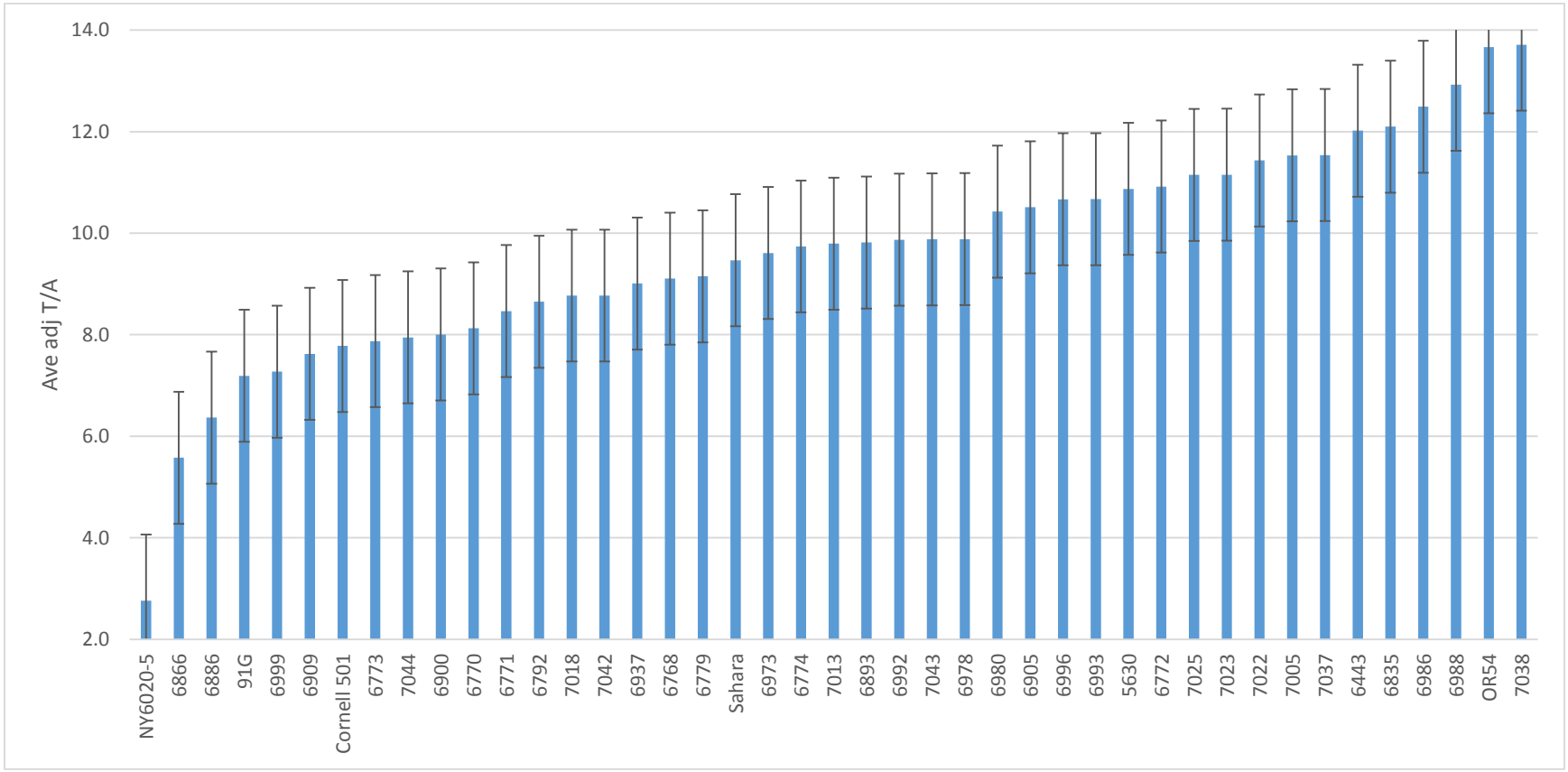

Figure 1. Average adjusted T/A of experimental and check green bean lines grown in a yield trial at the OSU Vegetable Research Farm in 2014.

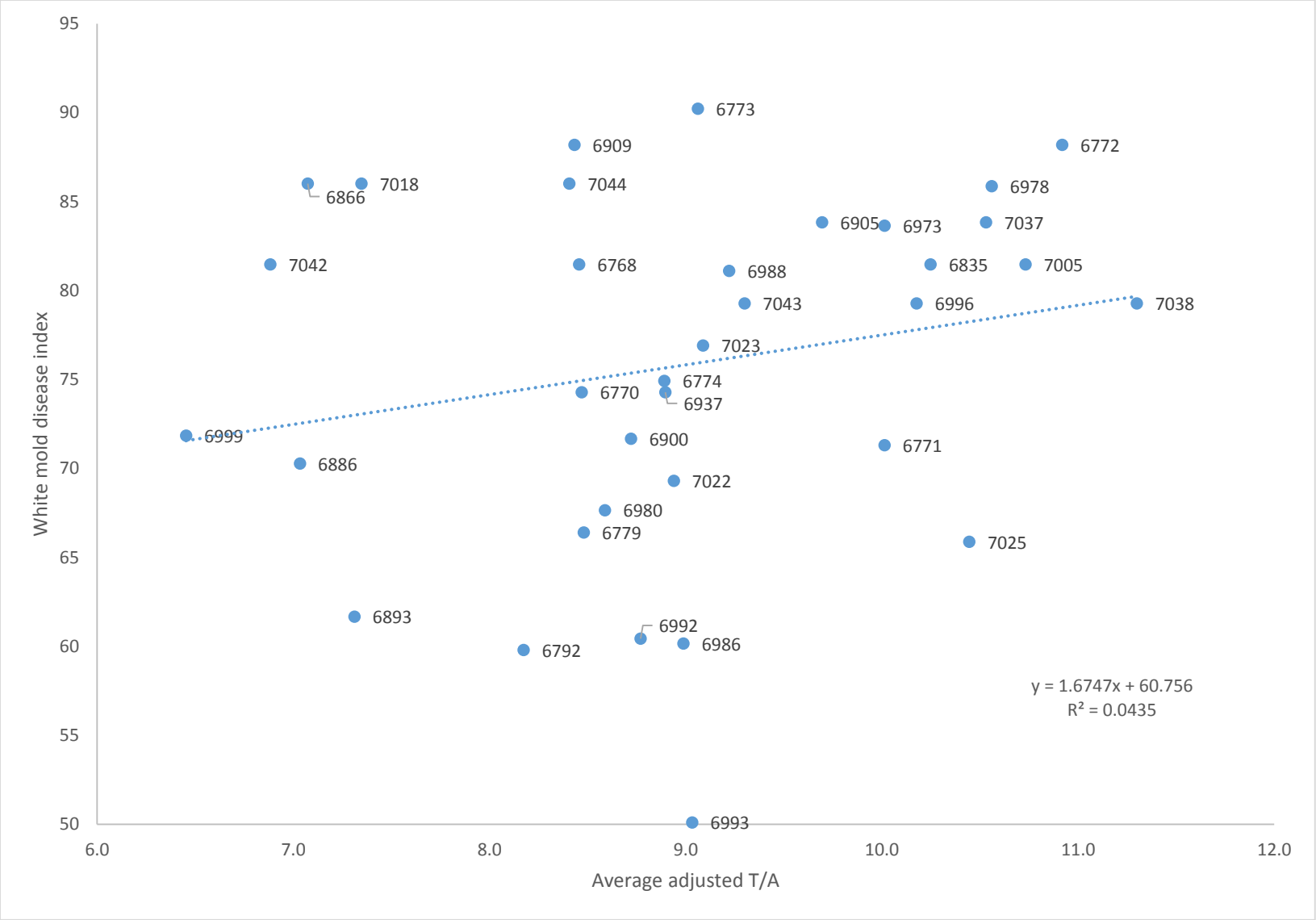

Figure 2. Scatter plot of white mold disease index vs. T/A yield of green bean lines and checks grown at the OSU Vegetable Research Farm. Check cultivars are omitted with only experimental lines being shown. White mold data is from 2013 and T/A yield data is averaged over 2012 – 2014.

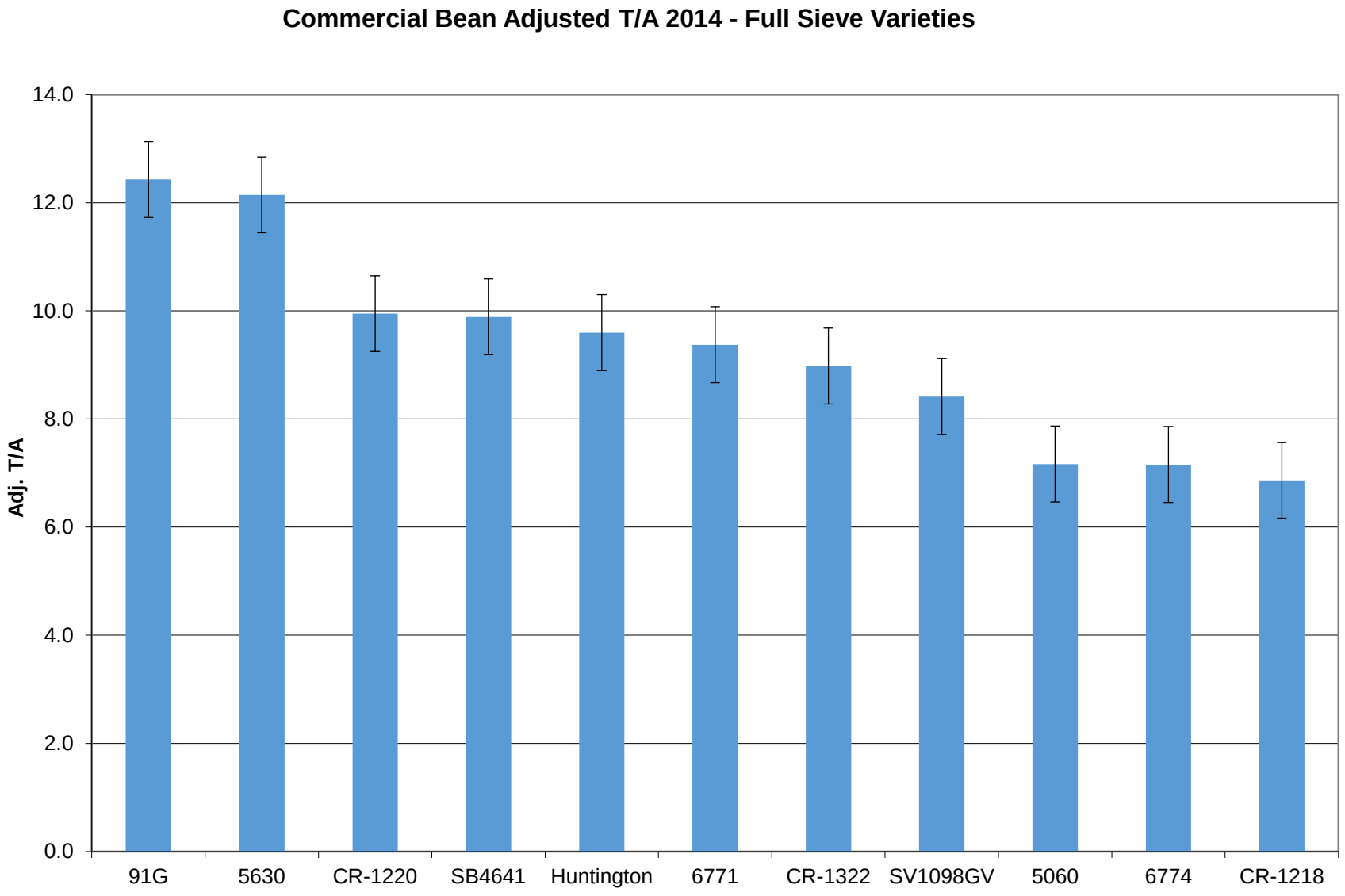

Figure 3. Adjusted T/A yield for five – full sieve green bean lines grown in a yield trial at the OSU Vegetable Research Farm in 2014.

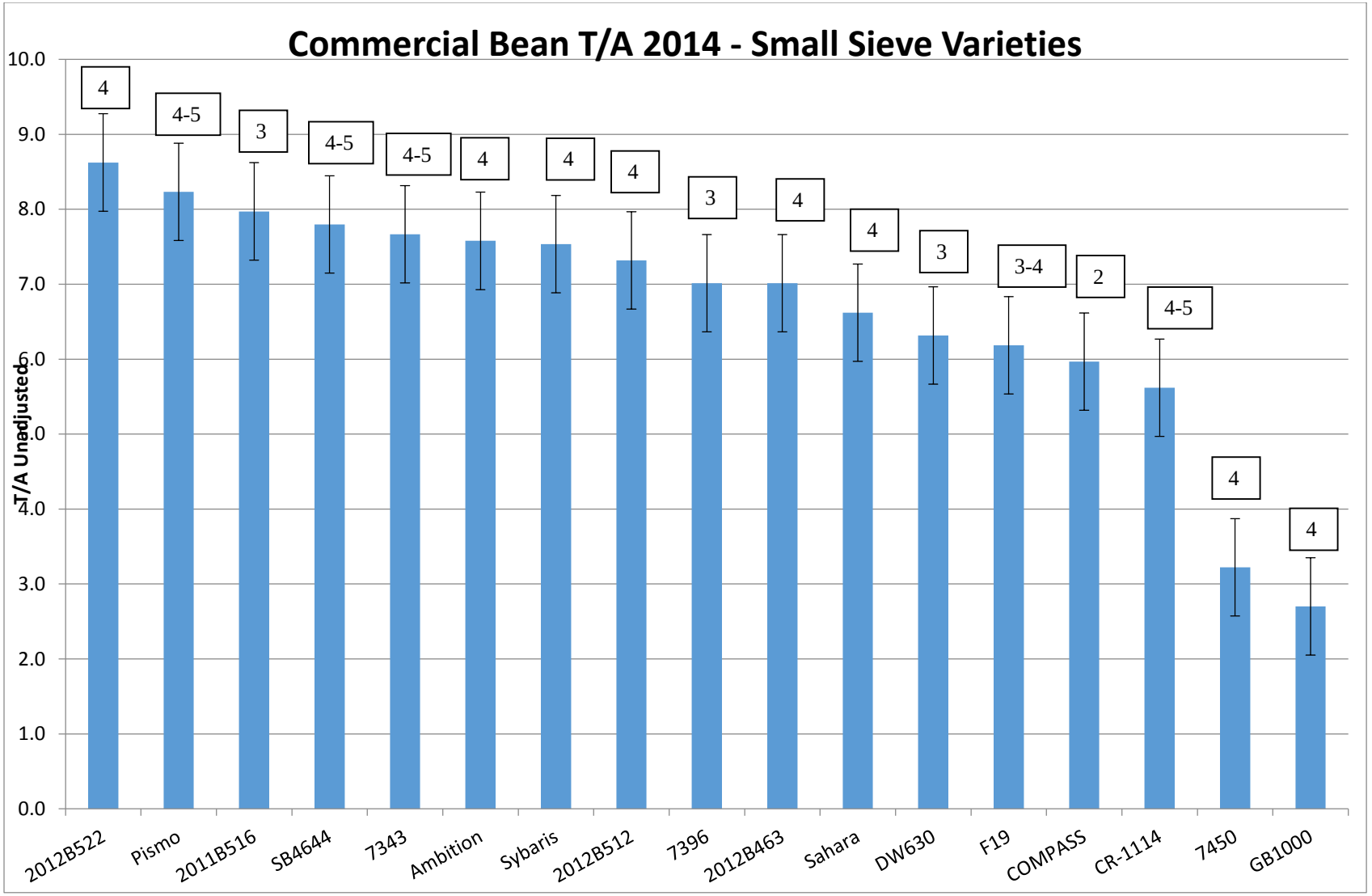

Figure 4. T/A yield for two to four sieve green bean lines grown in a yield trial at the OSU Vegetable Research Farm in 2014. Sieve size indicated above bar.