

**2012 California Survey of Residential Lawn and Garden Equipment
Owners: Population and Activity**



**California Air Resources Board
Air Quality Planning and Sciences Division
Gasoline Off-Road Inventory Section
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Section 1: Lawn and Garden Survey Overview

To reduce ambient ozone levels, there is a need to control ozone pre-cursors including reactive organic gases (ROG) and oxides of nitrogen (NOx). Lawn and Garden equipment are thought to be a significant contributor to ROG emissions inventories, especially in the South Coast Air Basin. The lawn and garden equipment emissions inventory includes lawn mowers (walk behind and riding), string trimmers, leaf blowers, chain saws, lawn edgers, lawn and garden tractors, tillers, wood splitters, brushcutters/hedgecutters, shredders, snow blowers, and stump grinders/chippers. Because registration and reporting requirements do not apply to lawn and garden equipment, surveys must be used to provide equipment population and activity estimates necessary for inventory development.

Lawn and Garden equipment have historically been categorized into two sectors: residential and commercial. The residential survey covers home owners that own and use lawn and garden equipment. The commercial survey covers institutions such as golf courses or cemeteries that maintain their own property and/or hire landscape contractors. Surveys were last conducted in 2001 on residential use of lawn and garden equipment, and in 2006 for commercial use. This survey covers residential use of lawn and garden equipment, and updates information from the 2001 survey. Over the last decade a relatively newer trend has been identified where more homeowners are contracting for lawn and garden services. While this survey does identify the fraction of homeowners that contract for services, it does not contain information about the lawn and garden equipment used by those contractors. That type of use will be the focus of a future survey.

A total of 2,999 surveys were completed over a two-month period by the Institute of Social Research of California State University Sacramento (ISR) in 2012. **Section 2** describes development of the sample frame and the methods for conducting the survey. **Section 3** demonstrates the survey responses were unbiased with regard to population by county. **Section 4** provides summarized survey responses. **Section 5** presents the survey questionnaire.

Section 2: Sample Frame Development and Methods

In order to administer the survey, a sample frame must be developed. In this case, a sample of households was developed, designed to be randomly selected and representative broadly of the entire State of California. This sample was developed using a Random-Digit Dialing (RDD) telephone sample. To create the RDD sample, ISR subcontracted with Scientific Telephone Samples, Inc. (STS). The sample from STS contained randomly-generated telephone numbers that covered all of California's area codes and exchanges, stratified by zip code. This means that the sampled phone numbers would be proportional to the population in each zip code, and ultimately representative of the entire State and all 58 counties.

Once the selection was complete, ISR and ARB staff developed the survey. Questions were designed to provide information about the population, activity, and use patterns of different types of lawn and garden equipment, and were also designed for consistency with the previous survey conducted in 2001. The complete survey is presented in Appendix A. ISR staff then administered the survey using a Computer-Assisted Telephone Interview (CATI) system. This telephone survey technique provided a structured computerized process to assist the interviewer in administering the questions in a consistent, efficient and timely manner.

Section 3: Interview Summary

ISR conducted the survey between March and June of 2012. A total of 38,424 telephone numbers were extracted from Scientific Telephone Samples and defined the sample frame of this project. After administering the survey, a total of 2,999 surveys were completed. This represents a roughly 8% response rate. Surveys were not completed for the remaining 92% of selected telephone numbers, as shown in the Table below.

Table 1: Sample Frame Summary

Survey Respondents	Count	Percentage
Complete Surveys	2,999	7.8%
Non-Completes*	31,302	81.5%
Refusals	3,755	9.8%
Mid Terminations	368	1.0%
Total Calls	38,424	100.0%
* non-completes include no answer, busies, answer machines, and/or faxes		

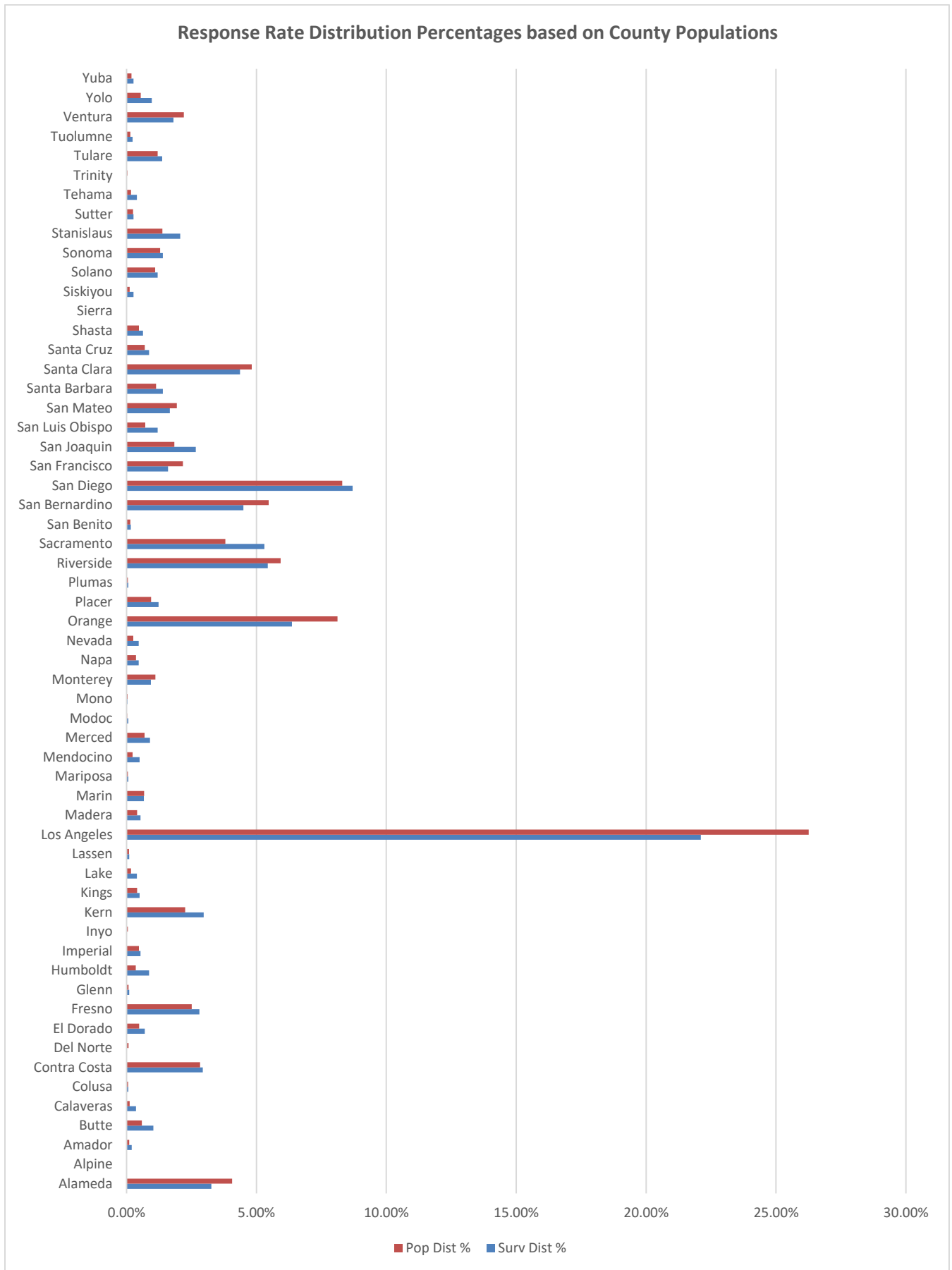
The next table compares the geographic location of completed household surveys to the population distribution by County as measured by 2012 population estimates by the California Department of Finance. Results show the survey is representative of the State overall.

Table 2: Response Rate Sample Distribution by County

2012 Residential L&G Survey		
County	Respondents	Distribution Percentage
Alameda	98	3.27
Alpine	0	0.00
Amador	6	0.20
Butte	31	1.03
Calaveras	11	0.37
Colusa	2	0.07
Contra Costa	88	2.93
Del Norte	0	0.00
El Dorado	21	0.70
Fresno	84	2.80
Glenn	3	0.10
Humboldt	26	0.87
Imperial	16	0.53
Inyo	0	0.00
Kern	89	2.97
Kings	15	0.50
Lake	12	0.40
Lassen	3	0.10
Los Angeles	663	22.11
Madera	16	0.53
Marin	20	0.67
Mariposa	2	0.07
Mendocino	15	0.50
Merced	27	0.90
Modoc	2	0.07
Mono	1	0.03
Monterey	28	0.93
Napa	14	0.47
Nevada	14	0.47
Orange	191	6.37
Placer	37	1.23
Plumas	2	0.07
Riverside	163	5.44
Sacramento	159	5.30
San Benito	5	0.17
San Bernardino	135	4.50
San Diego	261	8.70
San Francisco	48	1.60
San Joaquin	80	2.67
San Luis Obispo	36	1.20
San Mateo	50	1.67
Santa Barbara	42	1.40
Santa Clara	131	4.37
Santa Cruz	26	0.87
Shasta	19	0.63
Sierra	0	0.00
Siskiyou	8	0.27
Solano	36	1.20
Sonoma	42	1.40
Stanislaus	62	2.07
Sutter	8	0.27
Tehama	12	0.40
Trinity	0	0.00
Tulare	41	1.37
Tuolumne	7	0.23
Ventura	54	1.80
Yolo	29	0.97
Yuba	8	0.27
Totals:	2,999	100.00%

2012 DOF County Population	
Population	Distribution Percentage
1,530,176	4.06
1,088	0.00
37,123	0.10
220,263	0.58
45,216	0.12
21,598	0.06
1,066,602	2.83
28,527	0.08
181,711	0.48
943,493	2.50
28,226	0.07
134,728	0.36
179,138	0.48
18,547	0.05
849,977	2.26
151,774	0.40
64,412	0.17
34,040	0.09
9,889,520	26.25
152,325	0.40
253,374	0.67
17,952	0.05
87,965	0.23
260,029	0.69
9,550	0.03
14,414	0.04
419,586	1.11
137,731	0.37
97,366	0.26
3,057,879	8.12
355,455	0.94
19,698	0.05
2,234,193	5.93
1,433,525	3.81
56,137	0.15
2,059,699	5.47
3,128,734	8.31
816,311	2.17
692,997	1.84
271,502	0.72
727,795	1.93
426,351	1.13
1,813,696	4.81
265,350	0.70
178,107	0.47
3,178	0.01
44,808	0.12
415,787	1.10
487,672	1.29
519,339	1.38
95,119	0.25
63,430	0.17
13,471	0.04
451,540	1.20
54,524	0.14
829,065	2.20
204,349	0.54
72,642	0.19
37,668,804	100.00%

Graph 1: Response Rate Distribution Percentages based on County Populations



Section 4: 2012 Residential Survey Responses

Below are the survey questions and responses. Where questions were similar or identical we have compared results from the 2012 survey to results from the 2001 survey. Based on respondent answers to certain questions (as shown in Appendix A), the surveyor did not continue to follow up on several subsequent inquiries. For example, respondents that answered with “**A lawn service does all the yard work**” on Table 5 were not further asked whether or not they may still own/ use lawn and garden equipment, own/use gas cans, and/or ask if they would make any future equipment purchases. As a result, the percentages of the table results are based on respondents who answered the questions. At the beginning of each survey, the respondents were asked if they owned/operated a lawn care service (a company that’s hired to maintain your landscape’s needs). 99.7% of residential didn’t own/operate a lawn care service as shown in Table 3.

Table 3: Do You Operate a Lawn Service?

No	2990	99.70%
Don't know	8	0.27%
Refused	1	0.03%
Total	2999	100.00%

Table 4: What is the property/household type?

The vast majority of the survey respondents (69.9%) lived in a house, which is similar to the survey done in 2001.

Property Type	2012		2001	
	Count	Percentage	Count	Percentage
House	2097	69.9%	1,537	70.9%
Apartment	598	19.9%	167	7.7%
Condo	144	4.8%	81	3.7%
Townhouse	66	2.2%	49	2.3%
Other	88	2.9%	116	5.3%
Don't know/Unspecified	3	0.1%	219	10.1%
Refused	3	0.1%	0	0.0%
Total	2999	100.0%	2,169	100.0%

Table 5: Who maintains your lawn care service?

About 45% of household respondents outsourced their lawn care needs, whereas 38% maintained their own yard. Respectively, in 2001, 28% outsourced their lawn care needs while 51% did all the yard work themselves.

Who does your lawn care service?	2012		2001	
	Count	Percentage	Count	Percentage
A lawn service does all of the yard work	1342	44.7%	603	27.8%
I/others in the household do all of the yard work	1153	38.4%	1,107	51.0%
I don't have any of these areas on my property/I don't have a yard	414	13.8%	0	0.0%
I/others in the household do some of the yard work and a lawn service does the rest	72	2.4%	135	6.2%
Don't know	18	0.6%	324	14.9%
Total	2999	100.0%	2,169	100.0%

Table 6: Do you own/use any powered lawn and garden equipment at your current residence?

The comparison between the 2012 and 2001 residential lawn and garden survey paint a vast difference in many aspects. Whether it's a financial state of affairs or perhaps the yard sizes of the new house development has become smaller, lawn and garden equipment ownership and usage has changed in the last eleven years. The trend seems to show households outsource their lawn care needs more often than having to do it themselves. A third survey would be another opportunity to see if that new data point maintains the status quo or redirects the trend in the lawn and garden equipment category.

Do you own/use any powered lawn and garden equipment?	2012		2001	
	Count	Percentage	Count	Percentage
Yes, I own and use equipment	1098	36.6%	1124	51.8%
Yes, I own equipment but have not used it in over a year	32	1.1%	0	0.0%
No	523	17.4%	1045	48.2%
Refused	1	0.0%	0	0.0%
Don't Know	3	0.1%	0	0.0%
Didn't Respond	1342	44.7%	0	0.0%
Total	2999	100.0%	2169	100.0%

Table 7: What type of lawn and garden equipment to you have?

Overall, gas powered lawn and garden equipment is more prevalent than electric and diesel, combined. However, electric powered brushcutters/hedgecutters and leaf blowers are more popular than its gas-powered sibling. It should also be noted that many respondents have more than one piece of lawn and garden equipment in their inventory.

What type of lawn and garden equipment to you have?	2012		2001	
	Count	Percentage	Count	Percentage
Brushcutter/Hedgecutter	81	3.8%	142	3.9%
Chain Saw	137	6.4%	583	16.1%
Lawn & Garden Tractor	12	0.6%	50	1.4%
Lawn Edger	150	7.0%	331	9.1%
Leaf Blower	304	14.1%	545	15.0%
Riding Lawn Mower	52	2.4%	91	2.5%
Shredder/Chipper	12	0.6%	3	0.1%
Snow Blower	4	0.2%	12	0.3%
String Trimmers	359	16.7%	814	22.4%
Stump Grinder	1	0.0%	3	0.1%
Tiller	40	1.9%	9	0.2%
Walk Behind Lawn Mower	974	45.2%	905	24.9%
Wood Splitter	16	0.7%	36	1.0%
Not Listed	11	0.5%	105	2.9%
Total	2153	100.0%	3,629	100.0%

Table 8a: What is the lawn and garden equipment power types (based on power type count)?

The following tables (Table 8a and 8b) summarizes the distribution of lawn and garden equipment, powered by gasoline, electric, or diesel. In addition, it also shows the differences between the 2012 and 2001 residential lawn and garden equipment survey. Table 8a shows the breakdown of each equipment **based on power type count**, and their respected percentages. Table 8b shows the breakdown of each equipment **based on total equipment count** by respondents. Their percentages are also added to Table 8b.

Equipment Type	2012					
	Gas	Electric	Diesel	Gas %	Electric %	Diesel %
Brushcutter/Hedgecutter	22	58	1	27.2%	71.6%	1.2%
Chain Saw	90	47	0	65.7%	34.3%	0.0%

2001					
Gas	Electric	Diesel	Gas %	Electric %	Diesel %
36	105	1	25.4%	73.9%	0.7%
392	187	4	67.2%	32.1%	0.7%

Lawn & Garden Tractor	9	1	2	75.0%	8.3%	16.7%
Lawn Edger	85	65	0	56.7%	43.3%	0.0%
Leaf Blower	143	161	0	47.0%	53.0%	0.0%
Riding Lawn Mower	52	0	0	100.0%	0.0%	0.0%
Shredder/Chipper	7	5	0	58.3%	41.7%	0.0%
Snow Blower	3	1	0	75.0%	25.0%	0.0%
String Trimmers	208	151	0	57.9%	42.1%	0.0%
Stump Grinder	1	0	0	100.0%	0.0%	0.0%
Tiller	38	1	1	95.0%	2.5%	2.5%
Walk Behind Lawn Mower	864	108	2	88.7%	11.1%	0.2%
Wood Splitter	9	7	0	56.3%	43.8%	0.0%
Not Listed	7	3	1	63.6%	27.3%	9.1%

41	1	8	82.0%	2.0%	16.0%
183	147	1	55.3%	44.4%	0.3%
172	372	1	31.6%	68.3%	0.2%
87	2	2	95.6%	2.2%	2.2%
2	1	0	66.7%	33.3%	0.0%
12	0	0	100.0%	0.0%	0.0%
349	463	2	42.9%	56.9%	0.2%
2	1	0	66.7%	33.3%	0.0%
8	1	0	88.9%	11.1%	0.0%
771	133	1	85.2%	14.7%	0.1%
36	0	0	100.0%	0.0%	0.0%
66	37	2	62.9%	35.2%	1.9%

Table 8b (SUBSET): What is the lawn and garden equipment power types (based on total equipment count)?

Equipment Type	2012					
	Gas	Electric	Diesel	Gas %	Electric %	Diesel %
Brushcutter/Hedgecutter	22	58	1	1.0%	2.7%	0.0%
Chain Saw	90	47	0	4.2%	2.2%	0.0%
Lawn & Garden Tractor	9	1	2	0.4%	0.0%	0.1%
Lawn Edger	85	65	0	3.9%	3.0%	0.0%
Leaf Blower	143	161	0	6.6%	7.5%	0.0%
Riding Lawn Mower	52	0	0	2.4%	0.0%	0.0%
Shredder/Chipper	7	5	0	0.3%	0.2%	0.0%
Snow Blower	3	1	0	0.1%	0.0%	0.0%
String Trimmers	208	151	0	9.7%	7.0%	0.0%
Stump Grinder	1	0	0	0.0%	0.0%	0.0%
Tiller	38	1	1	1.8%	0.0%	0.0%
Walk Behind Lawn Mower	864	108	2	40.1%	5.0%	0.1%
Wood Splitter	9	7	0	0.4%	0.3%	0.0%
Not Listed	7	3	1	0.3%	0.1%	0.0%

	2001					
	Gas	Electric	Diesel	Gas %	Electric %	Diesel %
36	105	1	1.0%	2.9%	0.0%	
392	187	4	10.8%	5.2%	0.1%	
41	1	8	1.1%	0.0%	0.2%	
183	147	1	5.0%	4.1%	0.0%	
172	372	1	4.7%	10.3%	0.0%	
87	2	2	2.4%	0.1%	0.1%	
2	1	0	0.1%	0.0%	0.0%	
12	0	0	0.3%	0.0%	0.0%	
349	463	2	9.6%	12.8%	0.1%	
2	1	0	0.1%	0.0%	0.0%	
8	1	0	0.2%	0.0%	0.0%	
771	133	1	21.2%	3.7%	0.0%	
36	0	0	1.0%	0.0%	0.0%	
66	37	2	1.8%	1.0%	0.1%	

Table 9: How long do you use this lawn and garden equipment each time?

The activity of lawn and garden equipment are grouped by minutes of usage. The majority of usage falls under 30 minutes (in each use) based on respondents who own lawn and garden equipment.

Equipment Type	Grouped by Minutes						
	0-5	6-10	11-15	16-30	31-45	46-60	61+
Brushcutter/Hedgecutter	4	12	8	29	6	15	8
Chain Saw	11	10	19	37	2	18	30
Lawn & Garden Tractor	0	0	0	3	1	4	2
Lawn Edger	19	31	29	56	8	9	2
Leaf Blower	25	58	71	102	10	21	9
Riding Lawn Mower	4	0	1	7	6	19	14
Shredder/Chipper	1	0	0	3	0	4	3
Snow Blower	0	0	0	1	0	1	1
String Trimmers	24	53	63	131	11	37	31
Stump Grinder	0	0	0	0	0	1	0
Tiller	5	1	0	8	3	15	8
Walk Behind Lawn Mower	28	72	117	453	110	137	38
Wood Splitter	1	0	1	4	1	1	7
Not Listed	2	1	2	6	0	4	0

Table 10: How often do you use your lawn and garden equipment during each season?

Monthly segments are divided by seasons. Fall is defined as September, October, and November. Winter is defined as December, January, and February. Spring is defined as March, April, and May. Summer is defined as June, July, and August. Usage of each lawn and garden equipment is different for each season. For example, leaf blower frequency usage in Summer (2.86 times per) is more often than the Fall (2.64 times per) and in the Spring (2.40 times per). Winter has the lowest frequency usage (1.49 times per) with regards to leaf blowers.

Equipment	Season				Percentages			
	Winter	Spring	Summer	Fall	Winter %	Spring %	Summer %	Fall %
Brushcutter/Hedgecutter	0.74	1.55	1.61	1.21	13.2%	30.9%	31.1%	24.8%
Chain Saw	0.88	0.86	1.02	1.25	30.0%	24.9%	28.3%	16.7%
Lawn & Garden Tractor	0.30	1.80	2.70	1.20	7.4%	30.7%	41.5%	20.3%
Lawn Edger	0.89	2.31	2.56	1.71	10.2%	33.0%	34.2%	22.6%
Leaf Blower	1.49	2.40	2.64	2.86	18.2%	24.7%	26.7%	30.4%
Riding Lawn Mower	1.24	2.75	3.76	2.45	12.4%	27.9%	37.4%	22.3%
Shredder/Chipper	0.82	0.91	0.91	0.91	19.6%	23.6%	22.1%	34.8%
Snow Blower	9.00	1.00	1.00	8.00	49.3%	1.5%	1.2%	48.1%
String Trimmers	0.79	2.19	2.65	1.68	10.7%	30.1%	36.3%	22.9%
Stump Grinder	0.00	0.00	1.00	0.00	0.0%	0.0%	100.0%	0.0%
Tiller	0.39	1.15	0.83	0.78	9.6%	34.9%	32.3%	23.2%
Walk Behind Lawn Mower	1.15	2.49	3.14	2.06	13.4%	28.0%	35.2%	23.4%
Wood Splitter	1.43	1.00	2.00	1.13	35.0%	11.5%	24.5%	29.0%
Not Listed	1.22	1.50	2.00	1.67	19.2%	23.1%	32.4%	25.4%

Table 11: What is the approximate age of your lawn and garden equipment?

Most lawn and garden equipment are less than six years old. From the survey results, walk behind lawn mowers have the longest lasting longevity of all the other equipment pieces. Table 11 shows the age distribution of each equipment type, its percentage, and an average age by year.

Equipment Type	Age Distribution (Grouped by Month)					Percentages					
	0-24	25-48	49-72	73-108	109+	0-24	25-48	49-72	73-108	109+	Avg Age (by Yr)
Brushcutter/Hedgecutter	18	20	14	6	25	21.7%	24.1%	16.9%	7.2%	30.1%	6.6
Chain Saw	31	21	26	18	35	23.7%	16.0%	19.8%	13.7%	26.7%	6.9
Lawn & Garden Tractor	1	1	2	1	7	8.3%	8.3%	16.7%	8.3%	58.3%	13.3
Lawn Edger	42	35	28	12	35	27.6%	23.0%	18.4%	7.9%	23.0%	6.1
Leaf Blower	116	60	50	27	42	39.3%	20.3%	16.9%	9.2%	14.2%	4.5
Riding Lawn Mower	10	11	11	6	14	19.2%	21.2%	21.2%	11.5%	26.9%	6.6
Shredder/Chipper	1	2	3	5	2	7.7%	15.4%	23.1%	38.5%	15.4%	6.3
Snow Blower	3	0	1	0	0	75.0%	0.0%	25.0%	0.0%	0.0%	2.4
String Trimmers	120	91	59	21	50	35.2%	26.7%	17.3%	6.2%	14.7%	4.7
Stump Grinder	1	0	0	0	0	100.0%	0.0%	0.0%	0.0%	0.0%	1.0
Tiller	5	6	5	4	19	12.8%	15.4%	12.8%	10.3%	48.7%	10.6
Walk Behind Lawn Mower	222	186	179	76	194	25.9%	21.7%	20.9%	8.9%	22.6%	6.2
Wood Splitter	5	0	3	1	6	33.3%	0.0%	20.0%	6.7%	40.0%	8.0
Not Listed	5	3	1	0	4	38.5%	23.1%	7.7%	0.0%	30.8%	4.8

Table 12a: What is your lawn care service frequency, per month (all respondents **included**)?

Regarding the frequency of lawn care service, 25.8% of the respondents that use a lawn care service have their service work four times a month, while 8.8% of the respondents had their lawn care serviced twice per month. To illustrate complete transparency, Table 12 is broken down into two formats. Table 12a will show all 2,999 respondents including those who 'didn't know', 'didn't respond', and 'refused' the question. Table 12b is a subset with only those respondents who answered with a frequency number and their respective percentages. Table 12b has a more accurate representation of monthly lawn service frequency, based on numeric responses. In this case, 62.1% of responders have lawn service 4 times a month with twice a month lawn service coming in at 21.1%.

Frequency of lawn care service (per month)	Count	Percentage
1	74	2.5%
2	263	8.8%
3	77	2.6%
4	774	25.8%
5	18	0.6%
6	8	0.3%
7	1	0.0%
8	14	0.5%
9 - 42	17	0.6%
Don't Know	146	4.9%
No Response	1567	52.3%
Refused	40	1.3%
Total	2999	100.0%

Table 12b (SUBSET): What is your lawn care service frequency, per month (all respondents **excluding** 'don't know', 'no response', and 'refused' responses)?

Monthly Lawn Service Frequency	Count	Percentage
1	74	5.9%
2	263	21.1%
3	77	6.2%
4	774	62.1%
5	18	1.4%
6	8	0.6%
7	1	0.1%
8	14	1.1%
9 - 42	17	1.4%
Total	1246	100.0%

Table 13a: What is the service time for your lawn care services, in minutes (all respondents **included**)?

Lawn care service time is grouped in several timeframes, as shown in the Table 13a. About 13.9% of respondents estimate their lawn care services to be done within a 1-30 minute timeframe. However, we get a slightly higher response rate (14.2%) with those who estimate service completion between 30-60 minute timeframe. With that in mind, a new subset (Table 13b) was added to reflect only respondents that answered with a timeframe. Even with the new service time distribution, the percentages stayed relatively the same; 1-30 minute timeframe (35.8%) versus 31-60 minute timeframe (36.8%).

Timeframe	Count	Percentage
1-15 minutes	89	3.0%
16-30 minutes	326	10.9%
31-45 minutes	130	4.3%

46-60 minutes	297	9.9%
61-120 minutes	185	6.2%
121-180 minutes	54	1.8%
181 minutes and above	81	2.7%
Don't Know	1837	61.3%
Total	2999	100.0%

Table 13b (SUBSET): What is the service time of your lawn care services, in minutes (all responses *excluding* 'Don't know' responses)?

Lawn Service Timeframe	Count	Percentage
1-15 minutes	89	7.7%
16-30 minutes	326	28.1%
31-45 minutes	130	11.2%
46-60 minutes	297	25.6%
61-120 minutes	185	15.9%
121-180 minutes	54	4.6%
181 minutes and above	81	7.0%
Total	1162	100.0%

Table 14a: How many gas cans do you own to refuel your lawn and garden equipment (all respondents *included*)?

The majority of lawn and garden equipment owners own at least one gas can (21.2%) to refuel their gasoline powered tools. But the total percentage is skewed, since a majority of respondents left the question blank. Similarly to the previous table, we have created a subset for this question. Table 14a will include all respondents, including those who didn't own any gas can(s), as well as those who left the questions blank. This process allows for total transparency with all 2,999 respondents. Table 14b, however, is a subset table that will exclude the respondents who didn't own any gas can(s) and also left the question blank. Both tables will show their respective percentage distributions, based on each methodology.

Gas Can Owned	Count	Percentage
1	637	21.2%
2	141	4.7%
3	29	1.0%
4	16	0.5%
5	4	0.1%
6	4	0.1%
7	2	0.1%
8	2	0.1%
No gas cans	261	8.7%
Blank	1903	63.5%
Total	2999	100.0%

Table 14b (SUBSET): How many gas cans do you own to refuel your lawn and garden equipment (all responses *excluding* respondents that have 'no gas cans' and those who left the question 'blank')?

How Many Gas Cans Do You Owned	Count	Percentage
1	637	76.3%
2	141	16.9%
3	29	3.5%

4	16	1.9%
5	4	0.5%
6	4	0.5%
7	2	0.2%
8	2	0.2%
Total	835	100.0%

Table 15a: What is the Construction/Material of Your Gas Can (all respondents **included**)?

Plastic is the most purchased material used in gas cans. Metal and Other materials follow far behind, respectively. Continuing with complete respondent transparency, Table 15 is also divided into two tables. Table 15a has all the respondents accounted for, and the percentages of each count. Table 15b subset only includes responses where the respondents gave answers that reflect the gas can materials available in the current market. The new percentage distributions are also applied to this subset format.

Gas Can Construction	Count	Percentage
Metal	129	4.3%
Plastic	998	33.3%
Other	1	0.0%
Don't Know	15	0.5%
Refused	1	0.0%
No Response	1855	61.9%
Total	2999	100.0%

Table 15b (SUBSET): What is the Construction/Material of Your Gas Can (all respondents **excluding** 'didn't know', 'refused', and had 'no response' responses)?

Gas Can Construction	Count	Percentage
Metal	129	11.4%
Plastic	998	88.5%
Other	1	0.1%
Total	1128	100.0%

Table 16a: What is the size (grouped by gallon) of your gas can (all respondents **included**)?

Gas cans vary substantially in size. Grouping them based on capacity size makes it manageable for this table. The majority of fuel capacity is 5-6 gallons (10.5%), with 1 to 2 gallons following suit with 9.6% and 9.3%, respectively. There is, however, a large 'no response' and 'no gas can' count. This possibility could be the fact that many respondents outsource their lawn care needs or maybe don't have a yard at their residence, which eliminates the need to own a gas can. A subset (Table 16b) was created to illustrate the responses that only included answers with gas can fuel capacity. The percentage distribution for Table 16b is recalculated to represent its new data set.

Gas Can Fuel Capacity	Count	Percentage
0-1.1	289	9.6%
1.2-2.4	278	9.3%
2.5-3.4	141	4.7%
3.5-4	20	0.7%
5-6	314	10.5%
7-10	13	0.4%
11 or more	4	0.1%
Don't Know	56	1.9%
Refused	30	1.0%
No Gas Can	261	8.7%

No Response	1593	53.1%
Total	2999	100.0%

Table 16b (SUBSET): What is the size (grouped by gallon) of your gas can (all respondents *excluding* 'don't know', 'refused', 'no gas can', and 'no response' responses)?

Gas Can Size (gallons)	Count	Percentage
0-1.1	289	27.3%
1.2-2.4	278	26.3%
2.5-3.4	141	13.3%
3.5-4	20	1.9%
5-6	314	29.7%
7-10	13	1.2%
11 or more	4	0.4%
Total	1059	100.0%

Table 17a: What is the refueling frequency (per month) of your gas can (all respondents *included*)?

For gas can owners, 27.2% refuel their units once a month, while only 2.6% of gas owners refuel their gas cans twice a month. However the percentage distribution is skewed because of the large count on 'didn't respond' and 'don't know' responses. In order to illustrate a better assessment of percentages (based on count), a subset (Table 17b) was created. This approach gives an alternative and viable representation of how respondents refuel their gas cans on a monthly basis. Nonetheless, even with the change in methodology, gas can refueling frequency (by month) still stays the same with once a month at 83.4% and twice a month at 7.9% for Table 17b.

Gas Can Refuel Frequency (by month)	Count	Percentage
1	816	27.2%
2	77	2.6%
3	27	0.9%
4	16	0.5%
5	8	0.3%
6-8	33	1.1%
9 and above	1	0.0%
Refused	9	0.3%
Don't Know	146	4.9%
Didn't Respond	1866	62.2%
Total	2999	100.0%

Table 17b (SUBSET): What is the refueling frequency (per month) of your gas can (all respondents *excluding* 'don't know', 'refused', and 'didn't respond' responses)?

Gas Can Refuel Frequency (by month)	Count	Percentage
1	816	83.4%
2	77	7.9%
3	27	2.8%
4	16	1.6%
5	8	0.8%
6-8	33	3.4%
9 and above	1	0.1%
Total	978	100.0%

Table 18: Do you plan to buy any new lawn and garden equipment in the next 12 months?

Most lawn and garden equipment owners are content with what they currently have with only 6.6% of the owners planning to buy new equipment in the coming year.

Do you plan to buy lawn and garden equipment in the next 12 months	Count	Percentage
Yes	197	6.6%
No	2774	92.5%
Don't know	25	0.8%
Refused	3	0.1%
Total	2999	100%

Table 19a: If you're planning to buy lawn and garden equipment, what would it be (all respondents **included**)?

For respondents who are considering gas powered lawn and garden equipment purchase, within the next 12 months, the top three categories include walk behind lawn mowers (78.4%), string trimmers (60%), and leaf blowers (52.9%). With regards to battery powered lawn and garden equipment, the top two viable considerations include lawn edgers (87.5%) and brushcutter/hedgecutter (63.6%). Table 19b follows the same process as the other subset from previous tables, however, the responses with 'unspecified', 'don't know', and 'refused' were removed from the table.

Equipment Type	Gas	Electric	Don't Know	Refused	% Gas	% Electric	% Don't Know	% Refused
Brushcutter/Hedgecutter	3	7	1	0	27.3%	63.6%	9.1%	0.0%
Chain Saw	9	2	1	0	75.0%	16.7%	8.3%	0.0%
Lawn & Garden Tractor	1	0	0	0	100.0%	0.0%	0.0%	0.0%
Lawn Edger	0	7	1	0	0.0%	87.5%	12.5%	0.0%
Leaf Blower	9	7	1	0	52.9%	41.2%	5.9%	0.0%
Riding Lawn Mower	1	0	0	0	100.0%	0.0%	0.0%	0.0%
Shredder/Chipper	1	1	0	0	50.0%	50.0%	0.0%	0.0%
String Trimmers	12	7	1	0	60.0%	35.0%	5.0%	0.0%
Tiller	6	0	1	0	85.7%	0.0%	14.3%	0.0%
Unspecified	0	0	58	0	0.0%	0.0%	100.0%	0.0%
Walk Behind Lawn Mower	40	8	3	0	78.4%	15.7%	5.9%	0.0%
Wood Splitter	1	1	0	0	50.0%	50.0%	0.0%	0.0%
Don't know	0	0	15	0	0.0%	0.0%	100.0%	0.0%
Refused	0	0	3	0	0.0%	0.0%	100.0%	0.0%
Not Listed	4	3	6	4	23.5%	17.6%	35.3%	23.5%

Table 19b (SUBSET): If you're planning to buy lawn and garden equipment, what would it be (all respondents **excluding**, 'unspecified', 'don't know', and 'refused' responses)?

Equipment Type	Gas	Electric	Don't Know	Refused	% Gas	% Electric	% Don't Know	% Refused
Brushcutter/Hedgecutter	3	7	1	0	27.3%	63.6%	9.1%	0.0%
Chain Saw	9	2	1	0	75.0%	16.7%	8.3%	0.0%
Lawn & Garden Tractor	1	0	0	0	100.0%	0.0%	0.0%	0.0%
Lawn Edger	0	7	1	0	0.0%	87.5%	12.5%	0.0%
Leaf Blower	9	7	1	0	52.9%	41.2%	5.9%	0.0%
Riding Lawn Mower	1	0	0	0	100.0%	0.0%	0.0%	0.0%
Shredder/Chipper	1	1	0	0	50.0%	50.0%	0.0%	0.0%
String Trimmers	12	7	1	0	60.0%	35.0%	5.0%	0.0%
Tiller	6	0	1	0	85.7%	0.0%	14.3%	0.0%
Walk Behind Lawn Mower	40	8	3	0	78.4%	15.7%	5.9%	0.0%
Wood Splitter	1	1	0	0	50.0%	50.0%	0.0%	0.0%
Not Listed	4	3	6	4	23.5%	17.6%	35.3%	23.5%

Table 20: What gender demographic do you fall under?

Gender Demographic	Count	Percentage
Male	1889	63.0%
Female	924	30.8%
Refused	55	1.8%
Don't know	131	4.4%
Total	2999	100.0%

Table 21: How many are living in your current household?

How many people living in current household	Count	Percentage
1	496	16.5%
2	1569	52.3%
3	456	15.2%
4	234	7.8%
5	53	1.8%
6	13	0.4%
7	8	0.3%
8	2	0.1%
9 - 23	6	0.2%
Don't know	52	1.7%
Refused	110	3.7%
Total	2999	100.0%

Table 22: What age demographic do you fall under?

What age demographic do you fall under	Count	Percentage
Under 18	13	0.4%
18-24	113	3.8%
25-44	698	23.3%
45-64	1098	36.6%
65+	571	19.0%
Don't know	266	8.9%
Refused	240	8.0%
Total	2999	100.0%

Table 23: What is your income level?

What is your income level	Count	Percentage
Less than \$10,000	79	2.6%
\$10,000 to \$14,999	91	3.0%
\$15,000 to \$24,999	162	5.4%
\$25,000 to \$34,999	164	5.5%
\$35,000 to \$49,999	220	7.3%
\$50,000 to \$74,999	288	9.6%
\$75,000 to \$99,999	226	7.5%
\$100,000 to \$149,999	257	8.6%
\$150,000 to \$199,999	74	2.5%
\$200,000 or more	98	3.3%
Don't know	231	7.7%
Refused	1109	37.0%
Total	2999	100.0%

Section 5: 2012 Residential Survey Questionnaire

Air Resources Board Lawn & Garden Equipment Residential Survey 2011-2012

[Note: Answer choices which appear in (parenthesis) will not be read aloud to the respondent.]

Greeting, Introduction, and Qualification Section

Q10. Hello my name is _____ and I am a student calling from California State University, Sacramento. We are not trying to sell you anything. You were selected at random to participate in a quick, 10-minute statewide study on lawn and garden equipment, with questions like, "how often do you mow your lawn?" All your answers are confidential and you may refuse to answer any question at any time. Are you the person most familiar with the lawn and garden equipment at this address?

Yes, person agrees to be interviewed.

No, but someone new comes to phone (Skip to Q20)

No, that person is not home. (Schedule callback)

No, we don't do yardwork/don't have a yard (Skip to Q30)

(Don't Know)

(Refusal)

Q20. Hi, this is _____ and I am a student calling from California State University, Sacramento. We are not trying to sell you anything. You were selected at random to participate in a quick, 10-minute statewide study on lawn and garden equipment, with questions like, "how often do you mow your lawn?" All answers are confidential and you may refuse to answer any question at any time.

Yes, person agrees to be interviewed.

(Refusal)

Q30. Okay, I understand you don't do the yard work or don't have a yard but can I ask you just a few more short questions in order to complete our study? Your information is also very valuable.

Yes

No

(Don't Know)

(Refused)

If the respondent's answer is '2' they will skip to Not Qualified.

Q40. This survey is intended to collect information about household use of lawn and garden equipment not commercial use. Just to clarify, do you operate a lawn service?

Yes

No

(Don't Know)

(Refused)

If the respondent's answer is '1' '3' '4' they will skip to Not Qualified.

Q50. In which zip code do you live?

Q60. Which of the following best describes the property at which you currently live?

1. House

2. Apartment

3. Condominium

4. Townhouse

5. Other _____

6. (Don't Know)

7. (Refused)

Q70. Who usually maintains these lawn, shrub, tree, or garden areas (mowing the lawn, blowing leaves, etc.)?

1. I or others living in the household do all of the yard work
2. I or others in the household do some of the yard work and a lawn service does the rest
3. A lawn service does all of the yardwork
4. (Don't Know)
5. (Refused)

Q80. Do you own and/or use any powered lawn or garden equipment at your residence?

1. Yes, I own and use equipment
2. Yes, I own but have not used equipment in over a year
3. No
4. (Don't Know)
5. (Refused)

If the respondent answers '3' to Q70 and '3', '4', or '5' to Q80 they will skip to the Lawn Service section.

Equipment & Usage Section

Transition 1: Next I am going to ask you about the types of equipment you own and how often you use them.

[Note: Question 90 will be asked for each of the 14 types of equipment. Questions 100-130 will be asked for each piece of equipment owned. Images of each type of equipment will be at each interviewer station to assist the respondent if there is confusion about what each type of equipment is.]

Walk-behind Lawn Mowers

String Trimmers

Chain Saws

Leaf Blowers

Lawn Edgers

Brushcutter/Hedgecutters

Riding Lawn Mowers

Tillers

Lawn & Garden Tractors

Wood Splitters

Shredders

Snow Blowers

Stump Grinders/Chippers

Others _____

Q90. How many _____ do you own?

Q100. Let's discuss those _____ individually. Is the first [second/third/so on] _____...

Electric powered. Electric includes both battery-powered and plug-in.

Gas powered

Diesel powered

Other

(Don't Know)

(Refused)

Q110. How long do you use this piece of equipment each time?

15 minutes or less

Between 15 and 30 minutes

Between 30 and 45 minutes

Between 45 and 60 minutes

Other _____

(I Do Not Use This Equipment)

(Don't Know)

(Refused)

Q120. How often do you use this piece of equipment in ...

Spring, which is March, April, and May

_____ *times/month*

Summer, which is June, July, and August

_____ *times/month*

Fall, which is September, October, and November

_____ *times/month*

Winter, which is December, January, February

_____ *times/month*

Q130. What is the approximate age of this equipment?

_____ *years*

Portable Fuel Container Section

Transition 2: Now I would like to ask you a few questions about gas cans used to refuel your lawn and garden equipment.

Q140. How many gas cans do you own and use to refuel your lawn and garden equipment?

_____ *gas cans*

If the respondent answers '0' they will skip to the Equipment Purchases section. Note if answer is more than 1 Q150- Q170 will loop for each gas can.

Q150. About what size is this gas can? _____ gallons

Q160. What type of material is this gas can made of?

1. Metal

2. Plastic

3. Other

4. (Don't Know)

5. (Refused)

Q170. On average how often do you refill this gas can?

_____ *times per year*

Equipment Purchases Section

Transition 3: My next few questions are about powered lawn and garden equipment purchases you may be planning to make in the near future.

Q180. Do you plan on buying any additional powered lawn and garden equipment in the next 12 months?

- Yes
- No
- (Don't Know)
- (Refused)

If the respondent answers '2', '3', or '4' they will skip to the Lawn Service Section.

Q190. What type of equipment do you plan to purchase?

Q200. Do you plan to buy gas or electric?

- Gas
- Electric/Battery/Plug-in
- Other
- (Don't Know)
- (Refused)

Q205. Why do you plan to buy electric/gas-powered equipment over electric/gas-powered equipment?

_____ reason (open-ended)

Q210. Are you planning to buy any other pieces of powered lawn and garden equipment?

- Yes
- No
- (Don't Know)
- (Refused)

If the respondent answers '1' reask Q190-Q200.

Lawn Service Section

Q210. How often does the lawn service come?

_____ times per month

Q220. About how long does it take them to complete services each time?

_____ minutes _____ hours

Q230. We may do a future survey of providers of lawn and garden services. In order for us to contact them in a future survey like this one, would you please give us the name and phone number of the person or company that provides your lawn and garden service?

_____ name _____ phone number

Demographic Section

Q. How many adults live in your household?

Q. What is the age of the person who does the lawn and garden care in your household?

Q. I'm going to read a list of income ranges. Please tell me to stop when I reach the level of income for your household last year.
(Interviewer: confirm the correct range by reading it back to the respondent, for example, "So, it was between \$25,000 and \$34,999?")

less than \$10,000

\$10,000 to \$14,999

\$15,000 to \$24,999

\$25,000 to \$34,999

\$35,000 to \$49,999

\$50,000 to \$74,999

\$75,000 to \$99,999

\$100,000 to \$149,999

\$150,000 to \$199,999

\$200,000 or more

Refused

Not Qualified Section

I'm sorry for bothering you today, thank you for your time, goodbye.

Completion Section

Thank you, those are all the questions I have for you today. Thank you for participating in our survey. Goodbye.