

**Australasian
Soil and Plant
Analysis Council Inc.**



**ASPAC PLANT
PROFICIENCY TESTING
PROGRAM REPORT**

2012-13

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Foreword

This annual report is the ninth in the upgraded inter-laboratory proficiency program (ILPP) for plant chemical tests, the first of which occurred in 2004-2005 report. It covers three “rounds” each of four specially prepared samples sent to around 39 participants in October 2012, in February 2013 and in April 2013. A similar annual program for soils (reported separately) operated over much the same time period.

The members of ASPAC's LPC, listed on page iv of this report, oversaw the program. The ASPAC Executive is grateful to all of those who contributed to the report, inclusive of staff of Global Proficiency Ltd, our service provider.

The ASPAC-LPC and the ASPAC Executive Committee also appreciates the effort made by laboratories who utilized the method-specific proficiency program. By participating, they share a commitment to and responsibility for measurement quality, noting that measurement proficiency is only a component of laboratory accreditation to ISO-IEC 17025 standard, which should be an achievement goal for laboratory managers.

Dr Roger Hill
ASPAC-LPC Convenor

Acknowledgements

Mr Lyndon Palmer (South Australia) is thanked for helping to identify and quantify random Co, Cu and occasionally Fe contamination in circulated plant samples. We also thank Mr Alan Jeffrey (Queensland) and staff at Hill Laboratories (New Zealand) for their analytical efforts to help discover occasional plant sample contamination during preparative stages. Those commissioned by GPL to confirm that test plant samples were homogenous prior to circulation for proficiency testing purposes (e.g., LandCare Research, New Zealand) are also acknowledged, as are operational staff of GPL.

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[#] Dr Sparrow joined the Committee on 10 August 2015.

Service Provider Details 2016

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^A **Note:** GPL, under its “PlantChek” logo, is accredited (Accreditation No. 1) by IANZ (the New Zealand accreditation authority) to ISO/IEC 17043:2010 standard, noting that IANZ is a full member of both the International Laboratory Accreditation Cooperation (ILAC), and Asia Pacific Laboratory Accreditation Cooperation (APLAC). GPL is also recognised by NATA (National Association of Testing Authorities of Australia) as a proficiency provider.

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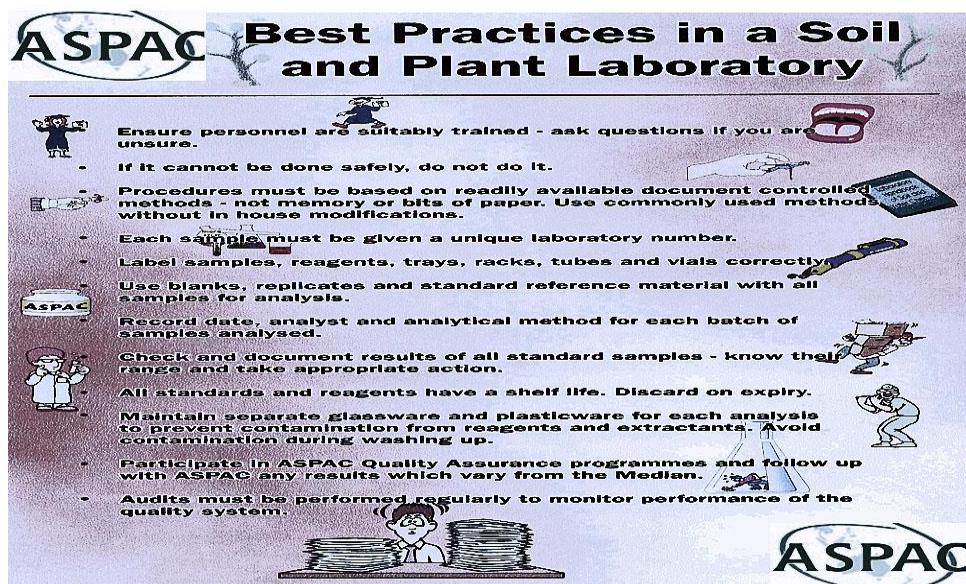
Notes on ASPAC Method-specific Certification: *what it is and what it is not*

In common with almost all soil, plant and water ILPPs worldwide, this plant ILPP used a selection of carefully prepared samples to allow participating laboratories to test and compare their method-by-method measurement performance relative to those of their peers across Australasia. The process is method-specific, as each method (or elemental test) is assessed separately using internationally-respected non-parametric statistics. Obviously, the peer review process is strongest for methods/tests with most participants, always ≥ 7 and typically well in excess of that number. Regular feedback with “round-by round” regularity provides tangible evidence to guide laboratory managers in their efforts towards measurement excellence.

Subsequently, a published numeric process was used on a method/test basis and on each of three “rounds” of four samples in the program year to determine whether or not a given laboratory qualified to be ASPAC Certified for that test. For the program year covered by this report, 22 was the maximum number of possible certifications per laboratory. The ASPAC Certifications achieved remained current until superseded by findings from the next corresponding ILPP.

Irrespective of method-measurement quality, it remains the responsibility of laboratory management to pay close attention to total quality management. This involves attention to performance in inter-laboratory proficiency programs while also taking account of variables such as technical competence and procedures, sample preparation, records of corrective actions, customer complaints, instrumental accuracy checks and maintenance, staff training / qualifications, standard-solution preparations, method validation / verification, internal audits, batch quality control, reports to clients, etc. Laboratory accreditation to ISO-IEC 17025 standard covers all of these. The National Association of Testing Authorities (NATA) is responsible for laboratory accreditation and compliance in Australia.

Field sampling, the transport of samples to the laboratory, and the interpretation of test results for clients are other areas that affect the final outcome of soil and plant chemical testing for diagnostic purposes. For helpful guidelines on these topics, refer to publications by Brown (1994)¹, Peverill *et al.* (1999)², Rayment (2006)³ and Reuter and Robinson (1997)⁴. The following “poster”, prepared by ASPAC, was designed for within-laboratory use.



-
- ¹ Brown, A.J. (1993). A review of soil sampling for chemical analysis. *Australian Journal of Experimental Agriculture* **33**(8): 983-1006.
- ² Peverill, K.I., Sparrow, L.A. and Reuter, D.J. (Editors) (1999). “Soil Analysis: an interpretation manual”. (18+369 pp.) CSIRO Publishing, Victoria.
- ³ Rayment, G.E. (2006). Australian efforts to prevent the accidental movement of pests and diseases in soil and plant samples. *Communications in Soil Science and Plant Analysis* **37**: 2107-2117.
- ⁴ Reuter, D.J. and Robinson, J.B. (Editors) (1997). “Plant Analysis: an interpretation manual”. (12+572 pp.) CSIRO Publishing, Victoria.

1. Introduction

This not-for-profit, annual report for 2012-13 consolidates (for ASPAC members and for the public record) program methodology, summary statistics, and a full listing of results by test for three “rounds” of plant chemical testing. For historical details on earlier annual ILPPs for both plant and soil samples undertaken by ASPAC, refer to the ASPAC Web Site at <http://www.aspac-australasia.com>.

The report includes a description of how ASPAC confers performance-based, method-specific certification to laboratories that participated throughout the program year. To respect confidentiality, the cross-reference between laboratory name and laboratory identification number is not included. However, laboratories certified as proficient for specific tests included in this annual program were documented at the time on ASPAC’s public web site mentioned above.

2. Program Details

2.1 Responsibilities

GPL was contracted by ASPAC as the plant ILPP provider for 2012-13. Accordingly, GPL had responsibility on a “round-by round” basis for sourcing and preparing samples and for the timely supply of prepared samples to participating laboratories. They also undertook data collation and statistical analysis and “round-by-round” reporting for ASPAC. In addition, they assembled the contents of the summary and “raw” data tabulations provided in Section 3 and Appendix 4 of this report.

Members of ASPAC-LPC had responsibility to implement and resolve matters of policy and to provide guidance on technical matters specific to plant chemical testing both to GPL and to laboratory participants. The ASPAC-LPC also undertook statistical checks and other actions for quality control purposes, participated in a Technical Advisory Group operated jointly with GPL, and contributed to training workshops. Laboratory managers and staff of those who contributed to this annual program are encouraged to seek help from ASPAC if they are shown to be operating at levels of measurement performance below their peers. Appropriate contacts are members of the ASPAC-LPC and/or State representatives of ASPAC (or equivalent).

Participants receive a unique, confidential laboratory number, subsequently used to identify the origin of each result presented in program reports and listings of results. Typically, this identification number carries forward from one annual program to the next.

2.2 Plant program participation

Some 39 laboratories [27 from Australia, 2 from Fiji, 7 from New Zealand, 2 from Papua New Guinea, 1 from Samoa] participated in the ASPAC plant ILPP in 2012-13, but numbers of reported results varied by “round” and plant test (see Table 1). The counts for each test element and sample are given in Table 1 and in Section 3. Contact details for laboratories that submitted results for any test in one or more of the three “rounds” are provided in Appendix 1.

2.3 Tests, units, laboratory participation and concentration ranges

Three proficiency “rounds” for plant materials – each comprising four samples – were offered in 2012-13. Participants were invited to analyse each sample using methods normally employed in their laboratory. Tests commonly performed are documented in Table 1, noting that participant numbers for each element and “round” are also listed. Laboratories were not required to submit results for every one of these tests, although a minimum of seven participating laboratories per “round” were required for any one test to permit meaningful statistical analyses. In addition, Table 1 includes concentration ranges (minimum, median, maximum) for each element across the 12 samples, noting that those

concentration ranges derive from “final” populations after removal of “stragglers” and “outliers”. For half of the 22 plant tests, the population average concentration for a given element was less than corresponding medians (average values not presented), while for 7 tests the average was greater than the median, and for the remaining 4 tests (C, Mg, N, Na), they were the same. Moreover, 16 grand median concentrations were lower than their 2011-12 counterparts, 2 were much the same, and only 2 were higher (nitrate-N was not assessed in 2011-12), suggesting final robust %CVs might be slightly higher for this program year than occurred in 2011-12.

Table 1. Plant tests, elemental symbols, units, the arithmetic average numbers of results per round submitted by participating laboratories in the ASPAC 2012-13 Plant ILPP, plus the concentration ranges and the final grand median concentration for all 22 tests.

2012-13 Plant tests	Symbol	Units	Number of participants			Grand median concentrations (finals) by test across 12 samples, as reported by labs		
			Oct 12	Feb 13	April 13	Minimum	Median	Maximum
Aluminium	Al	mg/kg	24	22	21	1.58	240	1210
Boron	B	mg/kg	29	29	28	1.08	29.4	185
Cadmium	Cd	µg/kg	15	13	13	3.72	178	1470
Calcium	Ca	%	37	34	31	0.006	0.608	1.46
Carbon	C	%	22	20	19	39.7	44.2	50
Chloride	Cl	mg/kg	22	22	21	420	3156	7740
Cobalt	Co	µg/kg	19	18	18	3.59	113	300
Copper	Cu	mg/kg	36	34	31	1.46	8.2	18.1
Iron	Fe	mg/kg	36	34	31	17.2	122	471
Lead	Pb	µg/kg	14	13	13	22.8	140	455
Magnesium	Mg	%	37	34	30	0.069	0.191	0.58
Manganese	Mn	mg/kg	36	34	31	3.70	202	1970
Molybdenum	Mo	µg/kg	21	20	19	51.5	508	2390
Nitrogen	N	%	34	32	31	0.781	2.20	4.69
Nitrate-N	NO ₃ -N	mg/kg	8	8	11	0.055	276	1990
Phosphorus	P	%	36	34	31	0.117	0.277	0.47
Potassium	K	%	35	34	30	0.365	1.78	6.61
Selenium	Se	mg/kg	15	15	14	11.1	90.0	587
Silicon	Si	%	7	6	7	0.003	0.222	1.83
Sodium	Na	%	34	32	30	0.001	0.062	0.284
Sulfur	S	%	30	28	28	0.087	0.181	0.35
Zinc	Zn	mg/kg	36	34	30	11.8	33.9	93.6

All but one of the tests in Table 1 were assumed to be total concentrations in the plant material. The assumption is that all results were reported on a 65°C oven-dry basis, not on an “as received” basis. However, some results reported as “totals”, such as Al and Si, may only reflect acid digestible concentrations.

Details of analytical methods used are not described in detail in this report. Method-indicating codes, however, are summarized in Tables 5 and 6 of Appendix 4, while relevant Codes are included with the “raw-data” tabulations in Appendix 4.

2.4 Sample preparation and identification

Before distribution to participants, potential samples were assessed for homogeneity. Specifically, 10 containers of each sample were selected at random from the sub-sampled batch, according to the principles described by Thompson and Wood (1993)⁵. These sub-samples were then tested in duplicate for plant total N, using Dumas combustion. The tests were conducted in one laboratory that was accredited to ISO 17025 standard. Several of the samples were also checked for the accidental presence of trace heavy metal contaminants, as earlier mentioned.

Results from homogeneity testing were subsequently statistically assessed according to ISO REMCO Protocol N231 “Harmonised Proficiency Testing Protocol” of January 1992. Variations between samples were such that all sample batches other than ASP 101 were considered to meet homogeneity criteria suited to proficiency testing. Examples of the homogeneity data and statistical assessments are summarised in Appendix 2.

In addition to testing for homogeneity, the plant samples were irradiated or otherwise rendered biologically benign to comply with international and/or national biosecurity regulations or requirements⁶.

Ultimately, the samples used in the three “rounds” of the 2012-13 program were distributed and coded as follows: October 2012 – ASP 101-104; February 2013 – ASP 21-24; and April 2013 – ASP 41-44. The association between sample code and sample type is provided in Table 2. All 12 test plant samples were sourced from New Zealand.

⁵ Thompson, M. and Wood, R. (1993). International harmonized protocol for proficiency testing of (chemical) analytical laboratories. *Journal of AOAC International* **76** (4): 926 – 940.

⁶ Rayment, G.E.(2006). Australian efforts to prevent the accidental movement of pests and diseases in soil and plant samples. *Communications in Soil Science and Plant Analysis* **37**: 2107-2117.

Table 2. Sample identification and sample code numbers of the samples included in the 2012-13 ASPAC plant ILPP. All samples were sourced from New Zealand.

Round ID	Sample ID	Sample Type
112	ASP 101	Magnolia leaves
	ASP 102	Spinach leaves with midribs removed
	ASP 103	Alfalfa and oat straw
	ASP 104	Rolled whole oat grain
312	ASP 21	Maize flour
	ASP 22	Oat straw
	ASP 23	Split peas
	ASP 24	Avocado leaves
512	ASP 41	Pine needles
	ASP 42	Carrot roots
	ASP 43	Lucerne chaff
	ASP 44	Barley grain

2.5 Data analysis and periodic reporting

Laboratory results, after submission to GPL, were entered into a database and independently checked for data transfer accuracy prior to data processing. The non-parametric assessment of laboratory performance for each sample and method was performed by an iterative statistical procedure similar to that used in WEPAL inter-laboratory proficiency programs of Wageningen University. This procedure^{7,8} is suited to datasets of as few as seven laboratories, although larger laboratory populations are best. An outline of the “median / MAD” statistical procedure is provided in Appendix 3, with terms described in Table 3.

In addition to medians and MADs, other statistical parameters (also described in Table 3) were calculated before and following the omission of non-conforming results. The “raw” data submitted by participating laboratories on a test-by-test basis are documented in Appendix 4, sometimes rounded for table formatting purposes.

Results submitted by each laboratory were expected to have three significant figures, unless protocol or common sense dictated otherwise. For example, the program accepted data where it was common to report measured concentrations to the nearest third decimal point, such as 0.001 mg/kg for those trace metals reported in mg/kg, and 0.001 % for Na, while two decimal places were accepted for other tests, rather than to three significant figures. However, the program (like others internationally) did not accept a zero value nor a result reported as less than (<) or greater than (>) a specified number. In cases where the expected value was below the laboratory’s lower limit of reporting, the expectation was that the laboratory would either report the raw concentration readout from the instrument in absolute terms or a value half way between that value and zero. For high values, dilution was the expected option.

⁷ Rayment, G.E., Miller, R.O. and Sulaeman, E. (2000). Proficiency testing and other interactive measures to enhance analytical quality in soil and plant laboratories. *Communications in Soil Science and Plant Analysis* 31: 1513-1530.

⁸ Whitehouse, M.W. (1987). Medians and MADs - Statistical methodology used at Wageningen, The Netherlands, for interlaboratory comparisons in the plant exchange program. Ag. Chem. Br. Report, ACU87/36. 10 pp. (Qld Dept. Primary Ind., Brisbane.)

Interim reports for each “round”, summarizing measurement performance relative to the performance of all laboratories that undertook the same test/s, were routinely and quickly emailed to participants. The main purpose of these Interim Reports was to provide timely feedback and to enable laboratories to take prompt remedial action where appropriate. Interim reports also provided an opportunity to correct for any data-transfer and data-processing misinterpretations. In addition, a newsletter from GPL occasionally went to all participating laboratories. Its main purpose was to assist in the interpretation of interim reports. Also included in GPL’s newsletter was information about upcoming events and operational administration of the program.

Laboratories that participated in the 2012-13 plant ILPP all received from GPL (on behalf of ASPAC) a laboratory specific, confidential, Annual Summary Report. Each laboratory’s data for the 12 plant samples, the aggregate data from all participants, other relevant statistical data, and whether or not the test/s received ASPAC Certification (if applicable), were provided. The laboratory code number was included.

Table 3. Statistical terms and their meanings in the context of this ASPAC annual report

Statistical term	Meaning and/or derivation
Count or number	Original population size.
Maximum i	The highest of a range of values, based on the initial data set.
Minimum i	The lowest of a range of values, based on the initial data set.
Median	The median is the score at the 50 th percentile. It is the middle observation of a sequentially sorted array of numbers, except in the case of an even sample size. Here it is the arithmetic mean of the two observations in the middle of the sorted array of observations. The median of a reasonably sized array of numbers is insensitive to extreme scores.
Mean ^A	The arithmetic mean (or average) is the sum of the values of a variable divided by their number. It represents the point in a distribution of measurements about which the summed deviations equals zero. The arithmetic mean is sensitive to extreme measurements.
MAD	The <u>Median of the Absolute Deviations</u> , calculated as the median of the absolute values of the observations minus their median.
Interquartile range (IQR)	This is calculated by subtracting the score at the 25 th percentile (referred to as the first quartile; Q ₁) from the score at the 75 th percentile (the third quartile; Q ₃). This value is affected by the assumptions made in the calculation of the first and third quartiles, particularly for low population sizes. Moreover, these differences exist within and across statistical software packages. Prior to the 2004-05 rounds, ASPAC used the algorithm employed by EXCEL and some others. From the 2004-05 program, the algorithm employed has been that of SAS Method 4 ⁹ . In summary, IQR = Q ₃ -Q ₁ .
Normalized IQR	This equates to IQR x 0.7413, where the latter is a normalizing factor.
Robust % CV ¹⁰	The robust coefficient of variation (Robust % CV) = (100 x normalised IQR / median). For simplicity, the Robust %CV shown is for the initial results, and also for the “final” population of results for a test after the removal of “outliers” and perhaps “stragglers”, usually following one or two iterations. Note that for Interim Reports, this term is estimated as = (100*MAD*1.483)/ Median, separately for “i” and “f” datasets.
Letter “i” and the letter “f” associated with medians, means, MADs, IQR and Robust %CVs.	The letter “i” relates to the initial data set. The letter “f” relates to the “final” data set, generated after one or two iterations typically after removal of laboratories with statistical “outliers” (if any), and statistical “stragglers” (if any).

A When the mean is greater than the median, the distribution is positively skewed. When the mean is lower than the median, the distribution is negatively skewed.

⁹ SAS Procedure Guide.

¹⁰ “Guide to NATA Proficiency Testing”. 27 pp. (National Association of Testing Authorities, Australia, December 1997).

2.6 ASPAC's criteria for certification of laboratories for plant tests

Subject to satisfactory measurement performance, typically for 12 samples across three sequential “rounds” in a 12-month period, ASPAC awards participating laboratories with a printed, signed and dated *Certificate of Proficiency*. The *Certificate of Proficiency* identifies performance for each test that met criteria set by ASPAC. Certification for a given method / test (not laboratory accreditation) applies when a laboratory incurs no more than four demerit points for the 12 samples.

Demerit points (if any) were allocated through the identification of “outliers” and “stragglers” by the “median / MAD” statistical procedure mentioned earlier in this report. Appendix 3 provides details on how “outliers” and “stragglers” were identified. Two demerit points were allocated to each statistical “outlier”, while a statistical “straggler” was allocated one demerit point. As no sample result could be both an “outlier” and a “straggler”, a maximum of two demerit points is all that could accrue per sample for a specific test.

For any single “round” of four samples, three (3) was set as the maximum number of demerit points for a specific test. This was done so that unsatisfactory measurement for a test in one “round” did not in itself result in failure to be certified for that test across the three “rounds” in the designated 12-month period.

If a “round” was missed, the maximum number of three demerit points for every test in that “round” was allocated, unless very special circumstances applied and was known or advised expeditiously to the ASPAC-LPC through its Convenor. When the explanation was accepted, performance from the three most recently completed “rounds” was used to assess eligibility for certification. There were no “very special circumstances” in 2012-13.

ASPAC’s *Certificates of Proficiency* are only issued on completion of each annual program of three “rounds”. Nowadays, ASPAC provides details of certified laboratories by test on its public web site. Certifications obtained in the 2012-13 Plants’ program remained valid until superseded by findings from the following 2013-14 ILPP.

3. Summary Statistics

This section provides summary information and data (sometimes rounded only for table formatting purposes) on a test-by-test basis (alphabetical) for each of the 12 samples used across three “rounds” in 2012-13. The tabulations include values relevant to the iterative “median / MAD” procedure plus other parametric and robust statistics. For the meaning or derivation of the terms used in the tabulated summaries, see Table 3 and Appendix 3. All data are expressed on a dry weight basis.

2012-13: Aluminium (mg Al/kg)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	24	24	24	24	22	22	22	22	21	21	21	21
Minimum i	4.93	142	21.9	8.85	0.06	55.4	0.616	93.7	351	235	202	0.1
Maximum i	173	1440	396	320	8.13	148	14.7	183	541	548	382	142
Median i	125	1210	324	21.7	1.8	76.9	2.78	120	389	358	253	3.34
Mean i	119	1190	309	38.3	2.58	78.3	3.81	120	395	359	261	12.8
MAD i	8	80	24.2	2.15	0.715	3	0.885	6	20	19	16	1.53
IQR i	12.8	144	33.9	3.46	1.9	5.56	1.63	10.9	27.1	33	30.4	3.91
Robust CV% i	10	12	11	16	106	7.2	59	9.1	7.0	9.2	12	117
Median f	125	1210	325	21.6	1.58	76.9	2.42	121	387	359	253	2.48
Mean f	123	1220	323	20.8	1.36	76.2	2.63	122	387	362	255	2.64
MAD f	7	59.5	16.4	1.9	0.368	2.35	0.465	4.1	15.5	16	14.5	0.64
IQR f	10.4	125	31.5	3.31	0.857	4.23	0.941	6.34	26.7	27.1	25.8	1.15
Robust CV% f	8.3	10	9.7	15	54	5.5	39	5.2	6.9	7.5	10	47
Outliers	3	1	2	5	5	4	4	4	1	5	1	3
Stragglers	0	1	1	0	1	0	2	1	0	0	0	4

2012-13: Boron (mg B/kg)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	28	29	29	28	28	28	29	29	28	28	28	28
Minimum i	137	31.2	1.8	0.01	0.573	1.06	4.88	20.9	7.27	13.3	23	0.01
Maximum i	360	74.2	27.1	35.5	7.19	6.02	11.9	40.5	19.2	31.8	37.6	8.4
Median i	185	41.1	23.8	1.2	2.31	3.03	7.64	25	11.7	22.5	28.5	1.18
Mean i	187	41.9	23.1	3.64	2.65	3	7.63	25.2	12.3	22.7	28.7	1.68
MAD i	11	1.7	0.8	0.425	0.575	0.41	0.51	1	0.7	0.6	0.65	0.706
IQR i	17.5	2.59	1.22	0.736	1.15	0.615	0.745	1.48	0.982	0.908	1.13	1.07
Robust CV% i	9.5	6.3	5.1	61	50	20	9.8	5.9	8.4	4.0	4.0	91
Median f	185	41.1	23.7	1.11	2.28	3.03	7.64	25.1	11.6	22.4	28.3	1.08
Mean f	183	41	23.6	1.18	2.48	2.92	7.59	24.9	11.7	22.4	28.5	1.13
MAD f	10	1	0.415	0.19	0.57	0.304	0.44	1	0.5	0.3	0.5	0.646
IQR f	16.9	1.63	0.686	0.368	0.919	0.426	0.641	1.37	0.593	0.519	0.741	0.975
Robust CV% f	9.1	4.0	2.9	33	40	14	8.4	5.5	5.1	2.3	2.6	90
Outliers	2	4	4	6	1	5	4	3	5	8	4	3
Stragglers	0	2	3	3	0	1	0	0	1	1	1	0

2012-13: Cadmium ($\mu\text{g Cd/kg}$)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	14	15	15	15	13	13	13	13	13	13	13	13
Minimum i	5.58	1210	50	3.5	0.01	42	5	131	51	35	13	2
Maximum i	52	2640	172	122	15.7	107	90.3	274	104	80	72	35
Median i	6.95	1470	97.3	16.7	3.99	85.1	19.7	207	82.1	66.2	61.6	16.6
Mean i	11.2	1560	95.6	23	4.35	83.6	24.9	205	81.6	65.1	57.7	16.7
MAD i	0.995	160	4.7	1.3	1.41	5.2	2	8	2.9	5.08	1.9	2
IQR i	3.25	218	8.9	2.3	3.18	8.15	2.85	22.2	9.3	8.67	3.34	3.24
Robust CV% i	46.7	14.8	9.14	13.8	80	9.6	15	11	11	13	5.4	20
Median f	6.38	1470	98.5	17	3.72	85.1	19.5	213	82	66.4	61.6	16.6
Mean f	6.43	1480	98.5	17.1	3.4	85.2	20	212	81.4	67.6	61.1	16.4
MAD f	0.38	145	2.5	0.64	1.64	3.1	1.4	8	2.3	4.25	1.5	2
IQR f	0.738	209	4.23	1.14	3.1	5.23	2.41	11.5	3.32	8.65	2.48	2.99
Robust CV% f	11.6	14.2	4.29	6.71	84	6.1	12	5.4	4.1	13	4.0	18
Outliers	3	1	4	5	1	2	3	3	4	1	4	2
Stragglers	2	0	0	0	0	2	0	1	1	0	0	0

2012-13: Calcium (%Ca)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	37	37	37	37	33	34	34	34	31	31	31	31
Minimum i	0.0002	0.0001	0.0001	0.000004	0.004	0.13	0.02	0.0666	0.272	0.182	1.2	0.006
Maximum i	1.71	1.7	1.1	0.937	64.2	2990	449	11200	0.7	0.59	2.08	0.111
Median i	1.46	1.36	1.02	0.067	0.006	0.275	0.042	0.989	0.418	0.333	1.3	0.03
Mean i	1.4	1.34	0.952	0.101	2.01	88.2	13.3	330	0.43	0.339	1.34	0.032
MAD i	0.04	0.07	0.029	0.003	0.001	0.010	0.002	0.041	0.013	0.013	0.05	0.002
IQR i	0.059	0.103	0.041	0.005	0.003	0.017	0.003	0.049	0.024	0.02	0.074	0.004
Robust CV% i	4.06	7.6	4.0	7.49	56	6.1	7.8	5.0	5.7	6.0	5.7	12
Median f	1.46	1.36	1.02	0.0669	0.006	0.275	0.041	0.989	0.417	0.333	1.3	0.03
Mean f	1.45	1.37	1.02	0.067	0.006	0.274	0.041	0.993	0.418	0.333	1.3	0.03
MAD f	0.03	0.05	0.02	0.003	0.0001	0.005	0.002	0.033	0.009	0.009	0.02	0.002
IQR f	0.05	0.082	0.030	0.004	0.0005	0.008	0.003	0.044	0.013	0.014	0.035	0.003
Robust CV% f	3.4	6.0	3.0	6.0	8.3	2.9	6.7	4.5	3	4.2	2.7	11
Outliers	5	4	5	8	9	6	7	3	4	5	4	5
Stragglers	0	2	1	0	3	4	1	1	2	2	5	0

2012-13: Carbon (%C)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	22	22	22	22	20	20	20	20	19	19	19	19
Minimum i	43.3	38.3	42.6	42.6	40.8	43.6	40.9	44.7	47.3	38.7	41.3	40.8
Maximum i	47.1	40.9	46.5	46.7	46.4	46.1	44.5	48.3	50.7	42.6	44.4	43.8
Median i	44.6	39.7	44.4	45.2	43.8	45.2	43.3	47.5	49.5	40.6	43.4	42.9
Mean i	44.6	39.7	44.3	45.2	43.5	45.1	43.1	47.2	49.3	40.5	43.1	42.6
MAD i	0.5	0.35	0.35	0.515	0.4	0.255	0.4	0.45	0.4	0.7	0.3	0.62
IQR i	0.815	0.482	0.593	0.686	0.645	0.41	0.723	0.741	1.04	1.33	0.89	1.11
Robust CV% 1	1.8	1.2	1.3	1.5	1.5	0.91	1.7	1.6	2.1	3.3	2.1	2.6
Median f	44.5	39.7	44.4	45.4	43.8	45.2	43.4	47.5	49.6	40.6	43.5	42.9
Mean f	44.5	39.7	44.4	45.4	43.8	45.2	43.4	47.4	49.6	40.5	43.5	42.6
MAD f	0.5	0.3	0.3	0.4	0.18	0.2	0.3	0.4	0.25	0.7	0.1	0.62
IQR f	0.815	0.445	0.445	0.63	0.222	0.278	0.43	0.667	0.408	1.33	0.222	1.11
Robust CV% f	1.8	1.1	1	1.4	0.51	0.62	0.99	1.4	0.82	3.3	0.51	2.6
Outliers	1	2	3	2	4	3	1	2	2	0	4	0
Stragglers	0	1	0	0	1	1	4	0	1	0	2	0

2012-13: Chloride (mg Cl/kg)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	22	22	22	22	22	22	22	22	21	21	21	21
Minimum i	0.322	0.566	0.543	0.06	213	5830	213	488	396	1980	6730	396
Maximum i	3580	8810	5640	700	950	8380	1630	1590	3530	6850	9110	2370
Median i	2920	4890	5050	476	435	7640	605	780	1520	4850	7290	1460
Mean i	2680	4710	4590	441	455	7490	664	874	1580	4870	7340	1410
MAD i	90.5	265	205	48	74	148	61	62	129	208	159	131
IQR i	206	441	297	74.3	118	308	93.8	151	202	350	282	185
Robust CV% i	7.1	9.0	5.9	16	27	4.0	16	19	13	7.2	3.9	13
Median f	2950	4810	5060	481	420	7740	599	750	1500	4830	7270	1460
Mean f	2930	4820	5080	486	431	7690	609	756	1480	4820	7200	1450
MAD f	60	183	65	39	82	90	42.5	23	73	110	156	95.5
IQR f	105	286	116	59.3	115	184	65.6	33.4	123	198	305	149
Robust CV% f	3.6	6.0	2.3	12	27	2.4	11	4.5	8.2	4.1	4.2	10
Outliers	7	5	3	4	1	5	6	5	3	2	2	3
Stragglers	1	1	3	1	0	1	0	4	1	3	0	0

2012-13: Cobalt (µg Co/kg)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	19	19	19	19	18	18	18	18	18	18	18	18
Minimum i	12.4	180	143	79.7	0.8	18.3	27.4	77	79.7	0.356	158	2.64
Maximum i	118	415	350	1560	29.2	76	78.8	134	125	51.2	218	52.5
Median i	64.3	300	240	263	4.39	45.8	55.9	87.1	84.2	25.6	191	5.29
Mean i	62.7	309	246	351	6.85	45.2	55.5	91	87.3	27.4	191	9.19
MAD i	8.3	41.8	19	53	2.07	3.45	5.3	5.15	2.5	4.6	8.5	1.88
IQR i	13.6	57.1	34.8	121	4.3	6.06	7.95	8.23	5.36	10.7	15.6	3.52
Robust CV% i	21	19	15	46	98	13	14	9.5	6.4	42	8.2	67
Median f	64.8	300	240	261	3.59	45.8	55.9	86.3	84.1	25	191	4.37
Mean f	63.6	309	242	246	3.68	44.7	55.9	86.3	84.3	24.4	193	4.84
MAD f	5.21	41.8	7	50	1.41	2.05	3.15	3.55	1.9	2.8	8	1.03
IQR f	9.26	57.1	13	77.1	2.34	4.41	5.73	5.43	2.84	4.89	15.2	2
Robust CV% f	14	19	5.4	30	65	9.6	10	6.3	3.4	20	8.0	46
Outliers	4	0	3	3	3	3	4	2	2	3	1	3
Stragglers	1	0	4	0	1	1	0	0	0	2	0	1

2012-13: Copper (mg Cu/kg)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	36	36	36	36	34	34	34	34	31	31	31	31
Minimum i	7.75	2.08	9.6	1.12	0.492	5.83	5.4	9.35	4.54	1.17	0.9	2.9
Maximum i	21.6	13	24	17.4	3.35	9.75	8	17.5	9.77	6.87	9	6.75
Median i	13.4	8.75	18	10.9	1.54	7.11	7.07	11.7	6.47	4.04	5.98	3.9
Mean i	13.4	8.72	17.6	10.4	1.6	7.12	7.04	11.8	6.57	4.01	6	3.94
MAD i	0.65	0.575	0.845	1.19	0.17	0.56	0.33	0.68	0.17	0.29	0.25	0.23
IQR i	1.11	0.884	1.35	1.95	0.23	0.795	0.515	1.05	0.259	0.4	0.423	0.363
Robust CV% i	8.3	10	7.5	18	15	11	7.3	9.0	4.0	9.9	7.1	9.3
Median f	13.6	8.73	18.1	10.9	1.46	7.08	7.1	11.6	6.47	4.04	5.95	3.9
Mean f	13.4	8.7	18	10.9	1.46	6.98	7.09	11.6	6.48	4.08	5.93	3.88
MAD f	0.7	0.24	0.5	0.87	0.115	0.505	0.3	0.6	0.12	0.165	0.18	0.17
IQR f	0.875	0.371	0.89	1.39	0.169	0.754	0.504	0.86	0.185	0.285	0.278	0.267
Robust CV% f	6.4	4.3	4.9	13	12	11	7.1	7.4	2.9	7.1	4.7	6.8
Outliers	5	6	6	5	7	1	1	3	6	5	7	2
Stragglers	0	6	3	1	1	1	0	0	2	2	0	2

2012-13: Iron (mg Fe/kg)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	36	36	36	36	34	34	34	34	31	31	31	31
Minimum i	51.5	285	43.9	13.1	3.82	47.1	17.8	91.3	59.8	13.3	29.7	22
Maximum i	110	629	257	178	51	137	81.4	194	117	37.6	280	123
Median i	76.5	469	206	45.1	17.4	105	47.3	121	91.7	21.2	233	30.5
Mean i	76.8	462	199	47.5	19.1	101	47.8	121	90.3	22.2	221	33.9
MAD i	2.87	29.9	12.5	3.75	1.9	5.85	2.35	6	3.4	1.7	9	1.12
IQR i	5.22	48.9	22.8	5.91	2.6	7.75	3.56	8.52	4.74	2.74	16.3	2.22
Robust CV% i	6.8	10	11	13	15	7.4	7.5	7.1	5.2	13	7	7.3
Median f	76.2	471	209	45.3	17.2	105	47.4	121	91.9	21.1	234	30.1
Mean f	76.7	473	208	44.7	17.2	105	47.4	120	91.9	21.2	233	30.2
MAD f	1.67	23	8	2.9	1.6	4.5	2.2	4	2.8	1.03	5	0.7
IQR f	2.78	38.5	13.3	4.58	2.36	6.3	3.19	7.41	4.34	1.63	8.34	1.48
Robust CV% f	3.7	8.2	6.4	10	14	6	6.7	6.1	4.7	7.7	3.6	4.9
Outliers	7	5	3	4	5	5	5	6	5	6	7	7
Stragglers	4	0	4	2	0	1	0	1	1	3	2	1

2012-13: Lead ($\mu\text{g Pb/kg}$)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	14	14	14	14	13	13	13	13	13	13	13	12
Minimum i	75.8	274	94.4	14.9	2.04	136	2	106	172	45.6	36	3.2
Maximum i	477	634	312	285	250	740	202	200	400	250	609	254
Median i	119	455	149	45.6	28.2	236	26.7	127	222	134	120	42.1
Mean i	167	423	165	75.5	57.2	264	53.9	134	233	139	168	68.7
MAD i	19.6	67	10.5	19.7	15.8	10	20.9	5	20	30	9	29.5
IQR i	83.1	124	20.8	38.8	40	21.5	36	14.5	35.2	41.9	13.3	43
Robust CV% i	70	27	14	85	142	9.1	135	11	16	31	11	102
Median f	112	455	149	43.2	22.8	236	25.1	125	221	134	120	33.7
Mean f	108	423	149	45.5	20.7	238	22.3	126	219	139	119	37.2
MAD f	9	67	6	15.1	10.1	3.5	4.9	3	12.5	30	7.5	16.8
IQR f	18.2	124	10.6	23.2	21.1	8.71	17.4	5.93	23.9	41.9	11.9	31.4
Robust CV% f	16	27	7.1	54	92	3.7	69	4.7	11	31	9.9	93
Outliers	4	0	4	2	2	3	2	4	1	0	3	2
Stragglers	0	0	0	0	1	2	1	0	0	0	0	0

2012-13: Magnesium (%Mg)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	37	37	37	37	34	34	34	34	30	30	30	30
Minimum i	0.00003	0.0001	0.00002	0.00001	0.08	0.1	0.086	0.27	0.053	0.046	0.194	0.068
Maximum i	0.358	0.67	0.337	0.208	836	1040	882	2670	0.127	0.162	0.324	0.158
Median i	0.289	0.58	0.206	0.134	0.093	0.12	0.102	0.306	0.069	0.09	0.211	0.085
Mean i	0.282	0.557	0.201	0.129	24.7	30.7	26.1	78.9	0.070	0.09	0.218	0.086
MAD i	0.006	0.024	0.006	0.008	0.004	0.005	0.005	0.009	0.002	0.003	0.005	0.004
IQR i	0.012	0.037	0.01	0.011	0.007	0.007	0.007	0.012	0.002	0.005	0.009	0.006
Robust CV% i	4	6.3	4.9	8	8	5.7	7.3	3.8	3.5	6.1	4.3	6.5
Median f	0.29	0.581	0.208	0.135	0.093	0.12	0.101	0.306	0.069	0.09	0.21	0.085
Mean f	0.29	0.579	0.207	0.133	0.094	0.121	0.102	0.305	0.068	0.091	0.21	0.084
MAD f	0.006	0.019	0.007	0.007	0.004	0.005	0.004	0.004	0.002	0.002	0.003	0.004
IQR f	0.008	0.032	0.009	0.01	0.007	0.006	0.006	0.007	0.002	0.004	0.006	0.005
Robust CV% f	2.6	5.4	4.5	7.4	7.2	5.1	6.1	2.2	3.3	4.9	2.8	5.9
Outliers	10	4	5	4	3	4	4	3	4	6	6	2
Stragglers	1	0	0	0	0	0	0	5	0	1	1	0

2012-13: Manganese (mg Mn/kg)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	36	36	36	36	34	34	34	34	31	31	31	31
Minimum i	52.9	42	25.1	15.3	1.53	3.7	2.42	59.4	82	1.4	0.6	4
Maximum i	3500	83.1	49.8	66.5	71.3	76.7	15.9	2670	211	108	129	275
Median i	1970	54.5	29.5	46.8	3.71	69.1	9.81	80.2	103	12.7	33.2	6.48
Mean i	1950	55.7	30.7	45.6	5.66	66.5	9.82	155	107	15.5	35.7	18.5
MAD i	86.5	3.05	0.91	1.9	0.25	3.15	0.495	2.2	3	0.8	1	0.41
IQR i	138	4.43	1.39	2.85	0.406	5.32	0.699	3.43	5.19	1.19	1.48	0.63
Robust CV% i	7	8.1	4.7	6.1	11	7.7	7.1	4.3	5	9.3	4.5	9.7
Median f	1970	54	29.4	46.8	3.7	69.5	9.8	80.7	103	12.7	33.3	6.45
Mean f	1980	53.7	29.4	46.8	3.64	69.1	9.81	80.6	103	12.7	33	6.43
MAD f	75	1.7	0.75	1.1	0.188	2.8	0.44	1.5	2	0.5	0.8	0.35
IQR f	108	3.52	1.1	1.78	0.326	4.95	0.667	2.15	3.71	0.83	1.06	0.545
Robust CV% f	5.5	6.5	3.8	3.8	8.8	7.1	6.8	2.7	3.6	6.5	3.2	8.5
Outliers	6	6	6	6	7	2	3	5	4	4	6	6
Stragglers	0	1	2	2	1	0	0	4	4	2	1	0

2012-13: Molybdenum (µg Mo/kg)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	21	21	21	21	20	20	20	20	19	19	19	19
Minimum i	28.5	176	390	267	11.5	22.2	1780	37	62.6	11.4	59.4	1.76
Maximum i	427	1380	1300	830	466	366	2700	550	474	46000	898	387
Median i	111	707	843	468	140	152	2380	190	227	60.3	590	240
Mean i	146	763	866	477	164	161	2350	223	238	2500	557	228
MAD i	17.3	73	33	20	13.5	19.4	109	13.9	19	37.4	44	30
IQR i	30	125	63.4	29.3	27.2	25.6	176	21.8	36.3	69.4	64.5	34.1
Robust CV% i	27	18	7.5	6.3	20	17	7.4	12	16	115	11	14
Median f	110	702	841	471	139	152	2390	179	227	51.5	590	245
Mean f	112	719	846	469	142	156	2380	183	226	61.4	593	250
MAD f	8	44.5	10	5	8	2	100	10	15	26.1	34	19.5
IQR f	15.8	63.8	25.2	11.5	14.8	11.9	161	13.3	23.5	28.5	56.3	30.4
Robust CV% f	14	9.1	3	2.4	11	7.8	6.7	7.5	10	55	9.6	12
Outliers	7	3	5	6	5	4	1	5	5	2	3	4
Stragglers	1	2	3	2	0	4	0	0	0	2	0	1

2012-13: Nitrate-nitrogen (mg N/kg)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	8	8	8	8	9	8	8	11	11	11	11	
Minimum i	22	53.6	2.55	0.001	0.001	68.3	0.001	0.001	0.001	0.001	283	0.001
Maximum i	303	2320	300	300	486	1060	810	10400	378	1320	962	133
Median i	37.7	1890	218	2.91	7.55	136	11	10.3	14.5	28.4	859	10.3
Mean i	79	1610	183	42.9	71.9	232	122	1350	81.2	286	745	24.8
MAD i	13.5	180	78.5	2.9	7.54	19	10.9	10.1	14.5	21.6	100	9.68
IQR i	49.8	695	156	16.5	32.2	37.1	59.3	186	102	237	352	34.8
Robust CV% i	132	37	72	567	426	27	541	1820	706	836	41	337
Median f	28.8	1990	218	0.055	0.192	136	0.505	3.92	6.97	19.6	912	0.811
Mean f	30.5	1980	183	0.133	0.344	137	0.888	4.96	8.62	21.5	912	2.39
MAD f	3.7	105	78.5	0.05	0.191	15	0.435	3.55	6.39	1.5	47	0.631
IQR f	10	234	156	0.25	0.621	24.5	1.55	7.46	10.3	5.26	74.1	2.86
Robust CV% f	35	12	72	454	323	18	306	190	148	27	8.1	353
Outliers	2	2	0	2	2	1	2	2	3	4	2	2
Stragglers	1	0	0	2	2	1	2	1	1	2	2	3

2012-13: Nitrogen (%N)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	34	34	34	34	32	32	32	32	31	31	31	31
Minimum i	0.199	2.58	1.29	1.31	0.985	0.94	3.1	2.06	1.46	0.574	2.22	1.29
Maximum i	1.65	5.55	3.36	2.41	1.96	1.68	3.69	3.29	1.94	0.872	3.52	1.62
Median i	1.53	4.67	2.62	1.81	1.19	1.12	3.52	2.39	1.85	0.773	3.32	1.52
Mean i	1.47	4.55	2.58	1.81	1.2	1.15	3.48	2.41	1.83	0.762	3.26	1.52
MAD i	0.035	0.08	0.055	0.05	0.04	0.03	0.09	0.04	0.04	0.032	0.09	0.04
IQR i	0.054	0.169	0.061	0.074	0.072	0.056	0.13	0.076	0.067	0.050	0.119	0.067
Robust CV% i	3.52	3.61	2.34	4.1	6.07	4.96	3.69	3.18	3.61	6.52	3.57	4.39
Median f	1.54	4.69	2.62	1.82	1.19	1.12	3.52	2.39	1.86	0.781	3.33	1.53
Mean f	1.54	4.67	2.62	1.82	1.19	1.13	3.5	2.4	1.86	0.778	3.34	1.53
MAD f	0.03	0.05	0.03	0.04	0.04	0.03	0.09	0.04	0.04	0.032	0.075	0.04
IQR f	0.045	0.089	0.056	0.061	0.063	0.037	0.126	0.058	0.061	0.043	0.096	0.067
Robust CV% f	2.89	1.9	2.12	3.37	5.3	3.31	3.58	2.4	3.29	5.56	2.89	4.36
Outliers	5	7	4	4	3	5	1	4	3	2	3	2
Stragglers	2	1	1	0	0	0	0	0	1	0	0	0

2012-13: Phosphorus (%P)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	36	36	36	36	34	34	34	34	31	31	31	31
Minimum i	0.019	0.061	0.037	0.025	0.13	0.19	0.19	0.11	0.12	0.13	0.2	0.2
Maximum i	0.14	0.695	0.377	0.572	2720	2190	2990	2070	0.286	0.437	0.51	0.433
Median i	0.117	0.469	0.275	0.391	0.289	0.232	0.315	0.221	0.163	0.265	0.323	0.257
Mean i	0.114	0.451	0.269	0.383	80.2	64.7	88.1	61.1	0.164	0.262	0.329	0.258
MAD i	0.005	0.015	0.009	0.017	0.014	0.008	0.015	0.006	0.005	0.01	0.008	0.009
IQR i	0.008	0.016	0.014	0.026	0.021	0.012	0.025	0.009	0.008	0.015	0.012	0.016
Robust CV% i	6.81	3.44	4.93	6.54	7.25	5.27	7.78	4.28	5	5.59	3.67	6.06
Median f	0.117	0.47	0.275	0.391	0.288	0.232	0.314	0.221	0.163	0.266	0.324	0.259
Mean f	0.116	0.469	0.276	0.392	0.286	0.231	0.312	0.219	0.164	0.263	0.323	0.255
MAD f	0.005	0.007	0.007	0.016	0.012	0.007	0.014	0.006	0.003	0.008	0.004	0.007
IQR f	0.007	0.009	0.01	0.024	0.017	0.011	0.023	0.008	0.005	0.014	0.007	0.015
Robust CV% f	6.02	1.97	3.64	6.16	5.93	4.87	7.32	3.69	2.96	5.3	2.06	5.74
Outliers	3	9	5	3	4	3	3	3	6	4	6	3
Stragglers	0	3	2	0	0	1	0	0	3	0	3	2

2012-13: Potassium (%K)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	35	34	35	36	34	34	34	34	30	30	30	30
Minimum i	0.0001	0.005	0.0002	0.0001	0.259	1.55	0.837	1.21	0.532	1.99	2.27	0.353
Maximum i	1.39	7.92	1.96	1.68	2450	10900	5750	9790	1.19	3.65	3.96	0.911
Median i	1.01	6.58	1.72	0.369	0.381	1.82	1.03	1.46	0.679	2.77	3.08	0.439
Mean i	0.972	6.14	1.63	0.414	72.5	322	170	289	0.694	2.75	3.05	0.453
MAD i	0.036	0.405	0.08	0.022	0.021	0.07	0.054	0.04	0.021	0.13	0.075	0.019
IQR i	0.062	0.693	0.119	0.032	0.034	0.098	0.076	0.059	0.033	0.195	0.115	0.030
Robust CV% i	6.2	11	6.9	8.8	8.9	5.4	7.4	4.1	4.8	7.0	3.7	6.8
Median f	1.02	6.61	1.73	0.365	0.378	1.82	1.02	1.46	0.678	2.77	3.08	0.438
Mean f	1.01	6.62	1.73	0.369	0.377	1.81	1.01	1.47	0.676	2.77	3.08	0.433
MAD f	0.01	0.32	0.07	0.018	0.016	0.06	0.045	0.04	0.013	0.09	0.045	0.004
IQR f	0.029	0.53	0.111	0.026	0.023	0.096	0.066	0.053	0.023	0.148	0.074	0.013
Robust CV% f	2.8	8.0	6.4	7	6.1	5.3	6.5	3.6	3.4	5.4	2.4	3.1
Outliers	9	4	3	7	8	3	4	3	6	5	6	5
Stragglers	3	1	0	0	1	0	0	0	2	0	4	4

2012-13: Selenium (mg Se/kg)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	15	15	15	15	15	15	15	15	14	14	14	14
Minimum i	10	10	10	5.25	5	5	68.8	5	5	5	5	5
Maximum i	74.9	861	80.8	66.3	37.1	280	666	122	109	413	200	84.1
Median i	32.6	60.2	31	20	18.1	30.1	575	89	51.1	153	17.3	11.2
Mean i	33.5	173	36	22.5	20.4	54.2	459	83.7	48.7	177	29.2	18.1
MAD i	4.8	39.1	3.4	2.8	8.1	10.1	29	7.8	2.5	33	2.35	6.2
IQR i	11.3	81.3	18.2	4.45	13.1	19.3	288	10.4	8.32	80.5	3.76	8.65
Robust CV% i	35	135	59	22	73	64	50	12	16	53	22	77
Median f	33	46.6	30.2	19.6	18.1	28.5	587	90	51.4	147	17.3	11.1
Mean f	35.1	53.9	29.6	19.2	20.4	28.2	584	91.8	52.2	146	17.4	13
MAD f	3.9	28.5	1.6	2.1	8.1	2.6	11	5.2	1.7	12	1.7	6.1
IQR f	10.4	42.9	2.78	3.21	13.1	5.24	16.7	9.64	3.74	19.3	2.43	7.77
Robust CV% f	31	92	9.2	16	73	18	2.8	11	7.3	13	14	70
Outliers	2	3	6	3	0	2	5	3	4	4	3	1
Stragglers	2	0	0	0	0	3	2	1	0	1	1	0

2012-13: Silicon (%Si)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	7	7	7	7	6	6	6	6	7	7	7	7
Minimum i	0.089	0.043	0.076	0.059	0.003	0.136	0.002	0.062	0.006	0.002	0.003	0.004
Maximum i	1.86	0.488	0.817	0.107	0.018	0.69	0.021	0.265	0.29	0.018	0.206	0.081
Median i	1.7	0.060	0.124	0.086	0.006	0.226	0.004	0.206	0.030	0.003	0.121	0.022
Mean i	1.36	0.164	0.329	0.082	0.009	0.315	0.008	0.184	0.062	0.005	0.091	0.033
MAD i	0.16	0.017	0.048	0.019	0.002	0.053	0.002	0.033	0.002	0.001	0.071	0.011
IQR i	0.712	0.154	0.366	0.032	0.010	0.209	0.009	0.074	0.010	0.002	0.088	0.047
Robust CV% i	42	258	295	38	173	93	199	36	34	76	73	216
Median f	1.83	0.051	0.1	0.086	0.005	0.211	0.003	0.206	0.030	0.003	0.121	0.012
Mean f	1.8	0.051	0.1	0.082	0.005	0.199	0.003	0.184	0.030	0.003	0.091	0.014
MAD f	0.02	0.004	0.019	0.019	0.001	0.015	0	0.033	0.001	0.001	0.071	0.009
IQR f	0.091	0.010	0.032	0.032	0.002	0.058	0.000	0.074	0.002	0.002	0.088	0.011
Robust CV% f	5	19	32	38	38	28	12	36	5.9	82	73	90
Outliers	2	3	3	0	2	1	1	0	2	1	0	1
Stragglers	1	0	0	0	0	1	2	0	1	0	0	1

2012-13: Sodium (%Na)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	34	34	34	34	31	32	31	32	30	30	30	30
Minimum i	0.007	0.097	0.006	0.001	0.00002	0.008	0.001	0.005	0.01	0.159	0.03	0.001
Maximum i	0.024	0.275	0.116	0.31	9.95	956	27.3	86.8	0.062	3.08	0.074	0.025
Median i	0.009	0.22	0.031	0.003	0.002	0.09	0.003	0.008	0.041	0.284	0.049	0.007
Mean i	0.011	0.219	0.036	0.014	0.397	29.9	0.885	2.72	0.041	0.374	0.050	0.008
MAD i	0.001	0.017	0.002	0.001	0.001	0.005	0.001	0.001	0.002	0.015	0.002	0.001
IQR i	0.002	0.025	0.003	0.002	0.002	0.007	0.001	0.002	0.003	0.022	0.003	0.002
Robust CV% i	27	12	9	73	97	8.2	39	26	7.5	7.9	5.9	34
Median f	0.009	0.221	0.03	0.002	0.001	0.09	0.003	0.008	0.040	0.284	0.049	0.007
Mean f	0.009	0.223	0.030	0.002	0.001	0.091	0.003	0.008	0.040	0.284	0.049	0.007
MAD f	0.001	0.017	0.002	0.001	0.001	0.002	0.0002	0.001	0.001	0.012	0.001	0.001
IQR f	0.001	0.026	0.003	0.001	0.001	0.004	0.001	0.001	0.001	0.017	0.001	0.001
Robust CV% f	11	12	8.7	33	128	4.1	19	17	3.7	6.1	3	21
Outliers	8	1	6	7	3	5	5	3	4	6	5	5
Stragglers	0	0	2	2	2	4	3	0	3	0	4	0

2012-13: Sulfur (%S)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	29	30	30	30	28	28	28	28	28	28	28	28
Minimum i	0.085	0.225	0.134	0.12	0.041	0.142	0.14	0.189	0.094	0.088	0.312	0.088
Maximum i	0.119	0.42	0.291	1.74	945	1780	1880	2430	0.212	0.192	0.502	0.196
Median i	0.103	0.353	0.244	0.156	0.087	0.162	0.167	0.22	0.127	0.113	0.338	0.112
Mean i	0.104	0.35	0.242	0.211	33.8	63.8	67.3	87.1	0.129	0.116	0.347	0.115
MAD i	0.003	0.019	0.010	0.006	0.005	0.008	0.009	0.01	0.005	0.003	0.009	0.005
IQR i	0.006	0.029	0.013	0.01	0.007	0.011	0.014	0.015	0.007	0.007	0.015	0.007
Robust CV% i	6.1	8.2	5.3	6.4	8.1	6.8	8.2	6.8	5.8	6.2	4.3	6.3
Median f	0.103	0.353	0.244	0.153	0.087	0.161	0.166	0.219	0.127	0.111	0.336	0.112
Mean f	0.104	0.352	0.245	0.154	0.086	0.161	0.163	0.219	0.127	0.112	0.335	0.113
MAD f	0.002	0.019	0.008	0.004	0.005	0.007	0.009	0.009	0.005	0.002	0.008	0.003
IQR f	0.004	0.028	0.01	0.007	0.007	0.010	0.013	0.015	0.007	0.002	0.012	0.005
Robust CV% f	3.4	7.9	4.1	4.4	7.5	6.5	7.7	6.8	5.8	2.2	3.6	4.6
Outliers	6	2	5	6	2	1	2	1	2	5	4	3
Stragglers	3	0	1	1	1	0	0	0	0	5	0	2

2012-13: Zinc (mg Zn/kg)

Statistical parameters	Plant sample identification and values											
	October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
No of results	36	36	36	36	34	34	34	34	30	30	30	30
Minimum i	10.1	70.7	19.3	22	17.1	22.6	25.5	27	29.1	10.8	17.1	17.6
Maximum i	21	130	31.2	36.5	37.6	50.4	62	81.6	81.9	49.9	49	80.1
Median i	11.8	93.6	22.6	27.8	21	26.3	30.9	41.5	71.6	14.4	20.5	24
Mean i	12.5	93.9	23	27.4	21.6	27	32.3	42	70.3	15.6	21.8	25.4
MAD i	0.8	3.2	0.7	1.35	1.05	0.8	1.6	1.05	3.15	0.77	0.9	1.15
IQR i	1.63	5.21	1.13	2.08	1.39	1.41	2.54	1.69	4.91	1.13	1.37	1.67
Robust CV% i	14	5.6	5	7.5	6.6	5.4	8.2	4.1	6.9	7.8	6.7	7
Median f	11.8	93.6	22.6	27.8	20.9	26.3	30.8	41.5	72.3	14.4	20.4	24
Mean f	12	93.3	22.6	27.4	20.7	26.1	31	41.6	72.2	14.4	20.3	23.9
MAD f	0.7	2.95	0.55	1	0.85	0.65	1.5	0.65	2.85	0.6	0.45	0.9
IQR f	1.2	4.24	0.852	1.85	1.24	1	2.3	1.01	4.37	0.945	0.751	1.26
Robust CV% f	10	4.5	3.8	6.7	5.9	3.8	7.5	2.4	6.1	6.6	3.7	5.3
Outliers	4	6	8	4	4	5	3	6	2	6	6	5
Stragglers	0	2	0	1	0	1	0	2	0	0	2	0

4. Comments on Measurement Performance

Detailed evaluation of measurement performance is beyond the scope of this report. It is appropriate, however, to make a few observations.

From a sample suitability perspective, final median robust %CV's for each of the 12 plant samples assessed across all 22 tests combined, ranged from 3.65 to 13.0 with a grand median final robust CV for the program year of 6.38%. The grand median initial robust %CV (across the 12 test samples), prior to removal of outliers and stragglers, was only 2% higher. Test sample ASP 101, which initially tested as non-homogenous, was "middle-of-the field" with a final grand median robust CV of 6.21% across the 22 tests. Least variable across all tests was sample ASP 43, then samples ASP 103 and ASP 41, each with final robust CVs of 4.4%. The plant samples with most variability across the 22 tests were ASP 21 (the worst at 13%) and ASP 44 (10.5%). For plant total N concentrations, expressed as percent on a dry-weight basis, there was high coincidence between the 10 x 2 replicate results for all ASP test samples reported by the laboratory that undertook the homogeneity testing and sample-by-sample median values obtained from an average of 32 participating laboratories. The linear relationship of Y (Labs' result) = 0.9877x - 0.0042, with an r^2 of 0.999, was highly significant.

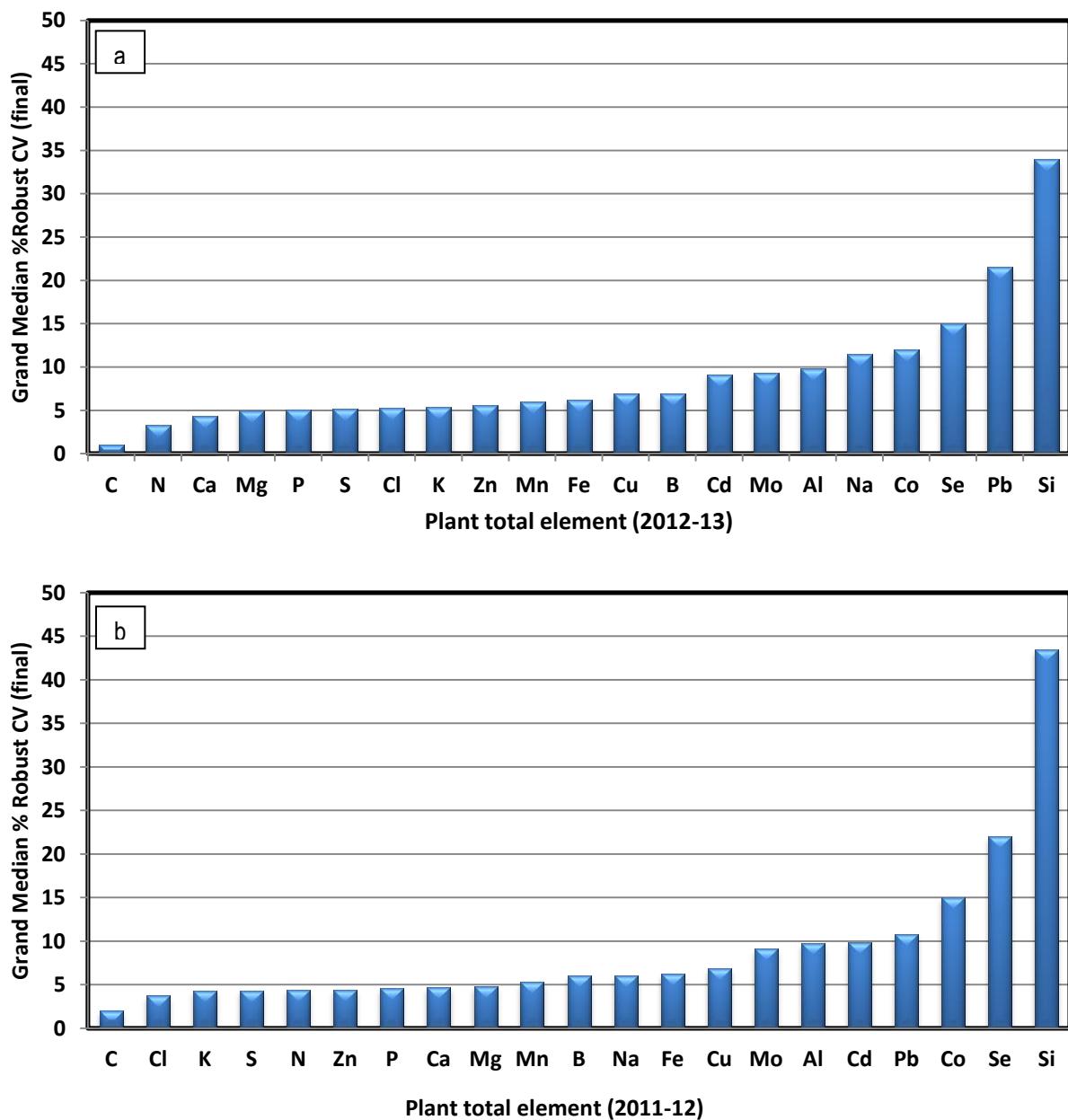
Raw data and summary tabulations on the median and ranges of elemental concentration data covered by the 2012-13 program indicate that a reasonably wide range of concentrations applied to most total elements. Exceptions included Ca and Mg, which tended to be more often low than high. The same assessment applied to total plant P and S concentrations. Future ILPPs for plants will need to include test samples known to accumulate higher concentrations of these essential plant nutrients.

The grand median robust % CVs across the 12 samples by test in 2012-13, after the removal of "outliers" and "stragglers", ranged from 1.1 (for C) to 110 (for nitrate-N), which is a narrower range than for corresponding tests in both 2010-11 and 2011-12. Figure 1(a) presents, in ascending order, the grand median robust %CVs for the 2012-13 program, while Figure 1 (b) shows grand median robust %CVs for 2011-12. Although not identical, there are many similarities with respect to the values for %CVs across the elements.

Across all 6604 reported plant test results in 2012-13, 15.0% were statistically assessed to be "outliers" (13.8% in 2011-12). The corresponding figure for "stragglers" was 4.1% (4.6% in 2011-12). For individual elements, the range of "outliers", expressed as percentages of the number of reported results for the particular test, ranged from 9.8% (for C) to 22.2% ($\text{NO}_3\text{-N}$), while those for "stragglers" ranged from 1.3% (Na) to 18.8% (Si) of reported results for the specified test.

Additionally on "outliers" and "stragglers", Figure 2 presents graphs of the numbers of reported results by test and numbers of statistical "outliers" (top) and "stragglers" (bottom) in 2012-13. The strong trend on this occasion was for average numbers of "outliers" to increase as the number of reported results for a given test increased, but there was no such trend for "stragglers".

The challenge for participating laboratories is to continually improve their measurement performances on a method-by-method basis. There will be on-going efforts by ASPAC, through its LPC, to continue to examine measurement performance into the future. Laboratories can assist, including by ensuring they pay close attention to units required for data submissions. It is clear from inspections of data summaries in Section 3 and from close examination of the "raw data" in Appendix 4, that use of the incorrect units in data submissions is an area that must be addressed by some laboratory managers.



**Figure 1. Grand median robust %CVs (final) for the 2011-12 [a] and 2012-13 [b] plant-program years.
(Not shown is nitrate-N, as it was not assessed in 2011-12).**

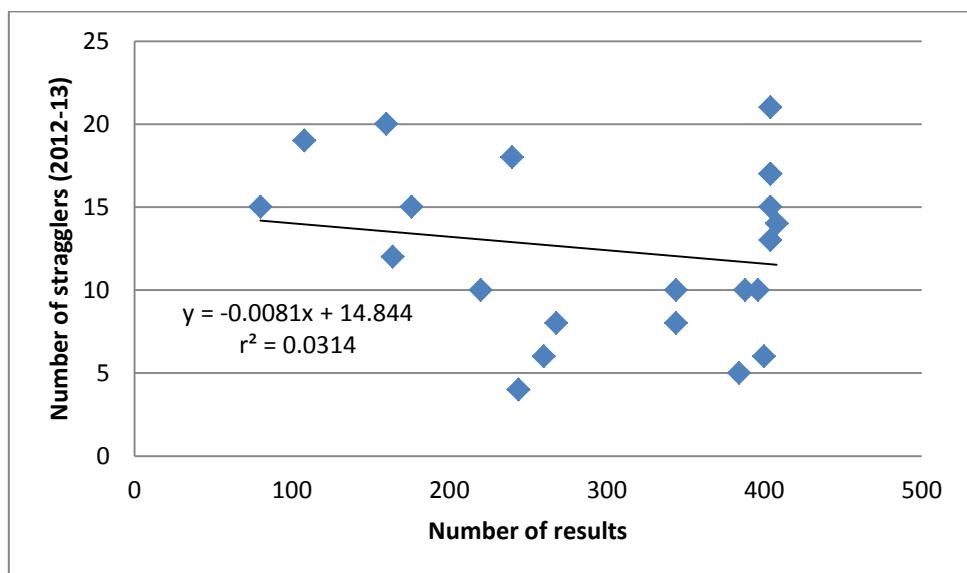
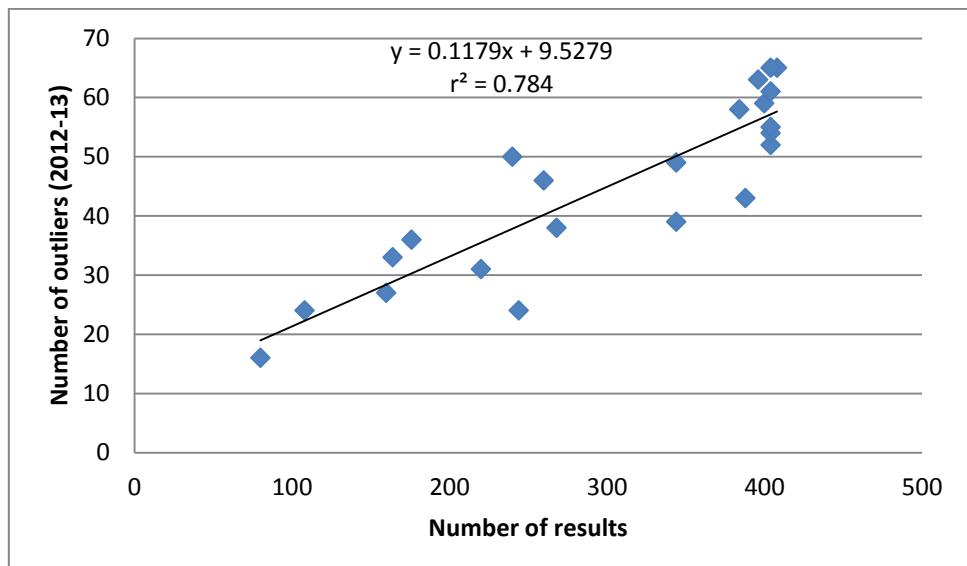


Figure 2. Trends in the numbers of “outliers” (top) and “stragglers” (bottom) with numbers of reported results for 22 plant elemental tests in 2012-13.

Appendix 1: List of laboratories (including contact details at the time) who participated in ASPAC's Plant ILPP in 2012-13, arranged by country

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Appendix 2: Homogeneity data and statistical assessments* for Total Plant N% (Dumas N) on the 12 test plant samples in 2012-13.

Sample name	ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44	
Sub-sample													
1	Rep 1	1.63	4.75	2.65	1.89	1.19	1.09	3.53	2.49	1.91	0.75	3.47	1.64
	Rep 2	1.62	4.67	2.64	1.85	1.24	1.09	3.59	2.45	1.89	0.77	3.4	1.58
2	Rep 1	1.49	4.69	2.65	1.89	1.21	1.10	3.56	2.48	1.89	0.79	3.38	1.62
	Rep 2	1.52	4.70	2.64	1.90	1.20	1.08	3.63	2.4	1.94	0.81	3.4	1.55
3	Rep 1	1.49	4.72	2.66	1.88	1.23	1.10	3.63	2.5	1.90	0.79	3.47	1.62
	Rep 2	1.52	4.72	2.60	1.87	1.21	1.10	3.62	2.41	1.88	0.78	3.41	1.56
4	Rep 1	1.51	4.68	2.62	1.83	1.23	1.10	3.65	2.46	1.92	0.75	3.35	1.61
	Rep 2	1.50	4.69	2.58	1.85	1.21	1.11	3.62	2.41	1.90	0.78	3.42	1.59
5	Rep 1	1.51	4.69	2.59	1.90	1.23	1.13	3.58	2.5	1.90	0.76	3.43	1.62
	Rep 2	1.54	4.70	2.57	1.80	1.22	1.08	3.62	2.41	1.90	0.78	3.43	1.62
6	Rep 1	1.52	4.71	2.68	1.83	1.22	1.10	3.6	2.47	1.93	0.78	3.36	1.62
	Rep 2	1.55	4.58	2.61	1.90	1.20	1.12	3.64	2.4	1.91	0.77	3.41	1.54
7	Rep 1	1.53	4.77	2.60	1.85	1.22	1.09	3.66	2.49	1.91	0.80	3.38	1.58
	Rep 2	1.56	4.72	2.64	1.87	1.21	1.12	3.62	2.38	1.90	0.80	3.50	1.59
8	Rep 1	1.50	4.74	2.67	1.84	1.22	1.09	3.5	2.48	1.93	0.76	3.30	1.61
	Rep 2	1.53	4.69	2.53	1.86	1.22	1.09	3.53	2.39	1.91	0.78	3.38	1.58
9	Rep 1	1.54	4.82	2.59	1.83	1.22	1.10	3.57	2.39	1.92	0.81	3.43	1.60
	Rep 2	1.52	4.69	2.62	1.83	1.21	1.10	3.6	2.47	1.90	0.78	3.41	1.61
10	Rep 1	1.55	4.68	2.54	1.87	1.22	1.14	3.63	2.5	1.90	0.78	3.32	1.58
	Rep 2	1.54	4.79	2.57	1.88	1.22	1.14	3.64	2.41	1.90	0.79	3.48	1.59

Mean	1.53	4.71	2.61	1.86	1.22	1.10	3.60	2.44	1.91	0.78	3.41	1.60
Analytical SD	0.0003	0.003	0.002	0.001	0.0002	0.0002	0.001	0.003	0.0003	0.0002	0.003	0.001
Sampling SD	0.001	0	0.0001	0	0	0.0001	0.001	0	0	0.0001	0	0
SD proficiency data	0.044	0.074	0.044	0.059	0.059	0.044	0.133	0.059	0.059	0.047	0.111	0.059
Homogeneity index*	0.754	0	0.195	0	0	0.235	0.256	0	0	0.236	0	0
Status	Not H**	H	H	H	H	H	H	H	H	H	H	H

* Homogeneity statistics calculated according to:-Thompson, M., Ellison, S.L.R. and Wood, R. (2006). "The International Harmonised Protocol for the Proficiency Testing of Analytical Chemistry Laboratories." *Pure Appl. Chem.* **78**(1): 145-196. IUPAC Tech. Report.

** Sample ASP 101 did not meet homogeneity criteria for plant total N. Staff of GPL, however, assessed program results for plant total N reported by around 32 participating laboratories and from the between-laboratory variations associated with other chemical tests on sample ASP 101 relative to the other 11 samples. It was concluded that ASP 101 was sufficiently homogenous for inclusion in the 2012-13 program. Moreover, the test sample has met homogeneity in the past. Accordingly, it was rated as "fit-for-purpose". Refer to Section 4 of this report for more information on this sample and its assessment.

Appendix 3: Statistical procedures used by ASPAC for its contemporary plant ILPP

Refer to Table 3 for a description of most statistical terms and their meaning. Of most significance is the “median / MAD” non-parametric, iterative procedure for identifying “outliers” ($\dagger\dagger$) and “stragglers” (\dagger) within datasets for particular tests and samples from multiple (typically 7 or greater) laboratories. See references in the body of the report for more details. Also, the median (μ) is regarded as a good estimate of the true mean, while the MAD; i.e. the median of the absolute deviations from the median, (@), is regarded as a good estimate of the standard deviation.

After tabulating the data with a separate column for each sample result and a separate row for each laboratory, calculations were applied iteratively. Each iteration operated at an action level of $[(X - \mu)/f@]$ (called the “ASPAC Score” for convenience) >2 , where “X” is the value reported by the laboratory (one replicate assumed), “ μ ” is the median of the population of values, and “f@” is a code for the Gaussian distribution of the sample size “n”, approximated by $[0.7722 + 1.604/n * t]$, with $t =$ the Student’s “t” for 5% (two-tailed) with $n-1$ degrees of freedom]. Excluding any case when a laboratory reported no result (or a non-numeric value) [these were automatically excluded], the laboratories at first iteration with an “ASPAC score” >2 were rated as “outliers” ($\dagger\dagger$). Following their removal (if any), the remaining population of laboratory data were subject to a second iteration involving a recalculation of the “ASPAC score”. When again >2 , the relevant laboratories were rated as “stragglers” (\dagger).

The other statistics summarised in Table 3 were calculated on the same populations of data. Only the first (i) and second (final; f) values appear in the data summaries in Section 3.

Appendix 4: Plant analytical method codes and “Raw” program data for the 12 plant samples across three “rounds” in 2012-13.

The following tabulations of “raw” plant analytical data, as reported by participating laboratories, are listed in approximate alphabetical order by element after removal of unnecessary precision, this following completion of statistical tests. Precision adjustments were performed only to assist “raw” data presentation. Statistical “outliers” and “stragglers” are indicated by †† and †, respectively. All results are understood to be on an oven dry basis. Method Codes listed in the “raw data” tabulations are described in Tables 5 and 6.

Table 5. ASPAC method indicating codes (MIC) to allow laboratories to record the preparation, extraction and/or digestion techniques used for each plant test/element reported in this ILPP. A separate ASPAC Code (see Table 6) is required to identify relevant instrumental and/or analytical finishes.

Preparation / Extraction / Digestion Technique	ASPAC MIC Code
Dry Ashing <u>with HF</u> , and uptake in HCl	AA
Dry Ashing <u>with HF</u> , and uptake in HNO ₃	AB
Dry Ashing <u>with HF</u> , and uptake in H ₂ SO ₄	AC
Dry Ashing without HF, and uptake in HCl	AD
Dry Ashing without HF, and uptake in HNO ₃	AE
Dry Ashing without HF, and uptake in H ₂ SO ₄	AF
Extraction with acid(s)	BA
Extraction with water	BB
Finely-divided dry sample	CA
Microwave digestion - closed system <u>with HF</u> , and final medium H ₂ SO ₄	DA
Microwave digestion - closed system <u>with HF</u> , and final medium HNO ₃ and/or HCl	DB
Microwave digestion - closed system <u>with HF</u> , and final medium HClO ₄	DC
Microwave digestion - closed system without HF, and final medium H ₂ SO ₄	DD
Microwave digestion - closed system without HF, and final medium HNO ₃ and/or HCl	DE
Microwave digestion - closed system without HF, and final medium HClO ₄	DF
Microwave digestion - open system <u>with HF</u> , and final medium H ₂ SO ₄	DG
Microwave digestion - open system <u>with HF</u> , and final medium HNO ₃ and/or HCl	DH
Microwave digestion in open system <u>with HF</u> , and final medium HClO ₄	DI
Microwave digestion - open system <u>with HF</u> , and final medium HNO ₃ / peroxide	DJ
Microwave digestion - open system without HF, and final medium H ₂ SO ₄	DK
Microwave digestion - open system without HF, and final medium HNO ₃ and /or HCl	DL
Microwave digestion - open system without HF, and final medium HClO ₄	DM
Microwave digestion - open system without HF <u>and</u> final medium HNO ₃ / peroxide	DN
Pellet (fused)	EA
Pellet (pressed powder)	EB
Schoeniger combustion with Pt and O ₂ , with uptake in HCl	FA
Schoeniger combustion with Pt and O ₂ , with uptake in HNO ₃	FB
Wet digestion - open system <u>with HF</u> , and final medium H ₂ SO ₄	GA
Wet digestion - open system <u>with HF</u> , and final medium HNO ₃ and /or HCl	GB

Preparation / Extraction / Digestion Technique	ASPAC MIC Code
Wet digestion - open system with HF, and final medium HClO ₄	GC
Wet digestion - open system with HF, and final medium HNO ₃ / peroxide	GD
Wet digestion - open system without HF, and final medium H ₂ SO ₄ (includes Kjeldahl – not quantitative for NO ₃)	GE
Wet digestion - open system without HF, and final medium H ₂ SO ₄ (includes Kjeldahl – quantitative for NO ₃)	GF
Wet digestion - open system without HF, and final medium HNO ₃ and /or HCl	GG
Wet digestion - open system without HF, and final medium HClO ₄	GH
Wet digestion - open system without HF, and final medium HNO ₃ / peroxide	GI
Wet digestion - open system without HF — diacid (HNO ₃ , HClO ₄)	GJ
Wet digestion - open system without HF — triacid (HNO ₃ , H ₂ SO ₄ , HClO ₄)	GK
Others	ZZ

Table 6. ASPAC's method indicating codes for instrumental and/or analytical finishes (IA-MIC) to allow laboratories to record the instrumental and/or analytical finishes associated with each plant test/element reported in this ILPP. A separate ASPAC Code (see Table 5) is required to identify relevant preparation/extraction/digestion techniques.

Instrumental and/or analytical finish	ASPAC IA-MIC Code
AAS-ETA: [Atomic Absorption Spectrophotometry Electro-Thermal Atomisation] background correction, without chemical modifier	01
AAS-ETA with deuterium background correction, without chemical modifier	02
AAS-ETA with Zeeman background correction, without chemical modifier	03
AAS-ETA with pulsed hollow cathode lamp background correction, without chemical modifier	04
AAS-ETA without background correction, with chemical modifier	05
AAS-ETA with deuterium background correction, with chemical modifier	06
AAS-ETA with Zeeman background correction, with chemical modifier	07
AAS-ETA with pulsed hollow cathode lamp background correction, with chemical modifier	08
AAS-Flame, without background correction, using air-acetylene	09
ASS – carbon rod –graphite furnace	10
AAS-Flame with deuterium background correction, using air-acetylene	11
AAS-Flame with Zeeman background correction, using air-acetylene	12
AAS-Flame with pulsed hollow cathode lamp background correction, using air-acetylene	13
AAS-Flame without background correction, using N ₂ O-acetylene	14
AAS-Flame with deuterium background correction, using N ₂ O-acetylene	15
AAS-Flame with Zeeman background correction, using N ₂ O-acetylene	16
AAS-Flame with pulsed hollow cathode lamp background correction, using N ₂ O-acetylene	17
Chromatography	18
Cold vapour technology	19
Flame emission	20
Gravimetric	21
Hydride technology and similar	22

Instrumental and/or analytical finish	ASPAC IA-MIC Code
ICP-AES	23
ICP-MS	24
Infrared — near-range (NIR)	25
Infrared — mid-range (MIR)	26
Ion selective electrode	27
Ion chromatography	28
Neutron activation analysis	29
Spectrophotometry (manual)	30
Spectrophotometry (auto; segmented flow, FIA, DA, etc.)	31
Titrimetric	32
Turbidimetric / or Nephelometric	33
Voltammetry (direct)	34
Voltammetry (stripping)	35
X-ray fluorescence	36
Dumas (e.g. Leco)	37
Others (specify)	38

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Aluminium (mg Al/kg)											
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
L009	GJ-23	124	1100	319	21.6	8.13 †	78	8.1 †	121	378	235 †	249	7.06 †
L011	GJ-23	117	1250	269	18.3	7.96 †	74.5	2.87	109	389	360	237	2.87
L013	DN-23	127	1269	347	21.7	1.07	76.9	2.54	118	394	341	259	4.83
L018	GJ-23	125	1440 †	358	19.6	0.629	73.3	3.9	126				
L019	DE-24	115	1152	323	29.2 †	3.43 †	68.7	4.1	95.5 †	364	383	227	9.52 †
L022	DE-23	132	1420	340	23.5	2.1	82	5.1 †	121	395	358	251	2.6
L023	DN-23	118	1190	319	21.1	5.31 †	72.1	3.68	119	366	272 †	262	6.54 †
L026	GI-23	122	1180	332	23.1	1.42	76.9	2.19	112	418	405	264	2.05
L028	DE-23	139	1410	384	23.5	1.93	85.3	2.18	126	424	364	288	7.62 †
L030	GJ-23	110	1150	285	19.4	2.5	60.4 †	2.1	96.5 †	351	324	232	3.34
L032	GG-23	113	1040	285	15.8	1.85	68.8	3.55	93.7 †				
L036	DE-23	134	1305	341	21.6	0.2	78.5	0.616 †	124	393	459 †	263	2.61
L040	DE-23	126	1370	327	21.8	1.72	78.6	1.88	119	382	353	252	1.81
L079	GJ-23	116	1150	298	17.3	4.6 †	70	6.7 †	115	368	339	239	1.35
L097	DE-23	173 †	1391	396 †	25.2	1.74	88.8 †	2.29	128	409	368	294	3.6
L133	GG-23	125	1200	21.9 †	320 †					378	373	253	8.18 †
L135	DN-23	127	1214	321	18.6	1.20	76.3	2.89	117	412	384	275	5.49
L139	AD-23	82.9 †	1026	294	8.85 †	0.291	55.4 †	1.22	104 †	355	238 †	202	0.1
L156	GI-24	4.93 †	142 †	216 †	134 †	1.49	148 †	6.41 †	183 †	541 †	548 †	382 †	142 †
L178	DE-23	127	1358	325	22.1	1.66	78.1	1.91	121	384	358	248	1.86
L179	GH-23	145	1220	330	31 †	5.5 †	79.3	14.7 †	137	399	386	292	50.8 †
L186	DE-23	108	1084	298	19.7								
L189	GJ-23	132	1260	349	23.2	1.91	74.6	2.16	122	410	354	237	2.35
L192	DE-23	109	1188	330	18.2	0.06	79	2.69	131	378	339	283	2.07

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Boron (mg B/kg)											
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
L009	DE-23	185	38.8	23.2	1.11	4.05	3.13	8.66	24.9	11.5	21.5	27.7	1.77
L011	GJ-23	184	44.3	22	1.68	3.85	3.79	7.64	24	12.4	23.1	29.7	1.82
L013	DN-23	185	41.9	24.4	1.59	2.63	2.71	7.55	24.5	10.8	22.3	27.8	1.22
L015	AD-23	177	37.3	23.3	1.42	2.47	3.04	5.14 †	25.2	11.6	22.1	27.2	0.773
L018	GJ-23	176	41.7	23.9	1.08	1.99	2.18	6.78	24	11.7	22.4	27.8	0.599
L019	DE-24	197	43.1	27.1 †	1.68	2.68	2.71	7.3	23.5	12.6	22.2	28.1	1.91
L022	DE-23	193	40.9	23.9	1.12	2.21	3.12	7.1	25.1	11.6	22.9	28.6	0.81
L023	DN-23	175	39.7	22.4	1.98 †	3.61	3.28	7.81	23.7	17.2 †	24.7 †	28.7	1.73
L026	GI-23	161	40.4	23.7	1.35	2.77	3.48	7.67	26.2	12.1	22.8	29.2	1.08
L028	DE-23	203	47.8 †	26.1 †	0.27 †	1.7	2.07	7.27	26.3	12.8	24.8 †	30.6 †	0.792
L030	GJ-23	167	42.1	23.8	2.92 †	4.13	4.71 †	8.14	25.4	13.8 †	25.6 †	29.7	2.23
L032	GG-23	187	38.8	27.1 †	3.31 †	3.17	5.08 †	8.94	25.4				
L034	GC-23	193	40.9	25.5	0.938	2.24	2.78	8.58	24.8	11.3	22.7	28	1.29
L036	DE-23	171	38.2	22.1	1.15	2.86	3.01	7.52	25.1	11.5	23.1	29.4	1.13
L040	DE-23	200	43.4	23.4	0.92	1.37	3.18	8.05	25.2	11.4	22.6	28.3	1.65
L045	GI-23	164	41.9	26.4 †	6.89 †	3.65	3.93	7.74	22.2	15.7 †	24.5 †	28.7	5.1
L064	GJ-23	175	39.4	23.1	1.1	3.7	3.11	4.88 †	22.7	10.6	22.6	28.3	8.4
L079	GJ-23	151	31.2 †	16.3 †	0.01 †	1.3	1.8 †	11.9 †	20.9 †	11.5	21.8	26.9	0.1
L080	GJ-30	137 †	36.6 †	23.6	7.1 †	7.19 †	6.02 †	9.63 †	24	7.27 †	13.3 †	23 †	3.01
L097	DE-23	199	41.1	24.6	0.734	2.28	2.66	7.85	26	11.6	22.4	28.1	0.434
L133	GG-23	189	35.6 †	1.8 †	21.6 †					10.7	20.4 †	25.1 †	0.01
L135	DN-23	193	41.5	23.8	0.887	2.23	2.73	7.72	26.3	12.1	21.9	28.8	0.428
L139	AD-23	193	41.5	26.4 †	1.74	0.573	1.06 †	6.62	28.2	13.1	18.3 †	30.1	0.1
L156	GI-24	360 †	74.2 †	24.6	35.5 †	2.25	1.12 †	6.94	40.5 †	19.2 †	31.8 †	37.6 †	5.42
L165	GG-23		40	24				7.1	25.8	11	22.2	27.9	0.25
L178	DE-23	198	43.4	23.4	0.98	1.26	3.13	8.15	24.6	11.6	22.5	28.1	1.68 †
L179	GH-23	163	47.1 †	22.7	1.25	2.1	3.2	7.2	21.6 †	14.4 †	25.3 †	32.2 †	2.44
L186	DE-23					1.93	2.46	7.08	25				
L189	GI-23	195	40.5	25	0.923	2.33	2.42	7.88	26.8	12.4	23.2	28.7	0.435
L192	DE-23	171	41.8	23.4	0.741	1.71	2.14	6.39	23.8	12.1	21.4	28.9	0.498

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Cadmium ($\mu\text{g Cd/kg}$)											
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
L009	GJ-23	5.58	1310	99.8	16.2	6.83	88.8	21.7	199	81.6	79.6	61.6	16.8
L011	DE-23	11.6 †	1210	73.7 †	16.4	4.86	67.2 †	19.3	172 †	64.9 †	51.9	44.5 †	20.3
L013	DN-23	6.03	1667	103	16.4	0.01	90.3	90.3 †	204	84.2	68.1	61.9	16.6
L019	DE-24	8.92 †	1496	96.3	16.7	0.62	77.2	18.3	181 †	73.3	60.8	63.2	17.1
L022	DE-24	5.91	1465	98.5	17.2	3.25	82	22.8	205	79.2	62.8	61	15.8
L023	DN-24	7.17	1630	97.3	18.5	3.44	85.1	19.7	207	84.3	63.3	58.5	13.2
L028	DE-24	6	1670	101	19.1	15.7 †	104 †	29.3 †	225	96.7 †	71.3	59.7	14.5
L032	GG-24	17 †	2640 †	172 †	28.1 †	3.99	85.9	21.7	215				
L040	DE-24	6.73	1466	96.7	17.7	5.3	83.8	18.5	215	82.1	66.2	63.1	18.6
L079	GJ-23	10 †	1373	54 †	10 †	5	42 †	5 †	131 †	51 †	35 †	13 †	2 †
L133	GG-23	52 †	1220	50 †	122 †					93 †	80	72 †	35 †
L165	GG-23		1400	90	10 †								
L178	DE-24	6.38	1470	102	17.2	5.4	83	18.7	213	81.8	65.3	62.1	18.5
L189	GJ-24	7.68	1600	94.2	15.4	1.02	90.9	17.7	228	84.6	66.5	58.8	13.9
L192	DE-24	6.4	1728	105	3.5 †	1.11	107 †	21.1	274 †	104 †	75.7	70.3 †	14.6

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Calcium (%Ca)											
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
L002	AD-09	1.52	1.43	1.02	0.084 †	0.039 †	0.26	0.05 †	0.996	0.424	0.182 †	1.25	0.039 †
L005	GI-23	1.45	1.49	0.98	0.057								
L007	AD-09	1.37	1.29	1.04	0.063	0.01 †	0.23 †	0.04	0.98	0.512 †	0.334	1.59 †	0.006 †
L009	GJ-23	1.44	1.35	0.98	0.068	0.056 †	0.275	0.063 †	1.01	0.413	0.372 †	1.3	0.033
L011	GJ-23	1.39	1.26	0.97	0.067	0.005 †	0.258	0.0387	0.947	0.382 †	0.314	1.2 †	0.027
L012	GE-11	0.717 †	0.96 †	0.62 †	0.044 †								
L013	DN-23	1.45	1.47	1.03	0.073	0.018 †	0.277	0.044	0.934	0.414	0.354	1.23 †	0.035
L015	GJ-23	1.49	1.41	1.06	0.07	0.006	0.275	0.041	1	0.405	0.322	1.25	0.028
L018	GJ-23	1.48	1.5	1.05	0.067	0.006	0.251 †	0.037	0.946	0.426	0.34	1.3	0.03
L019	DE-24	1.5	1.48	1.08	0.071	0.006	0.254 †	0.039	0.943	0.397	0.322	1.24	0.03
L022	DE-23	1.48	1.39	1.03	0.069	0.005	0.271	0.04	0.98	0.421	0.325	1.28	0.031
L023	DN-23	1.46	1.4	1.01	0.064	0.006	0.259	0.039	0.975	0.433	0.346	1.32	0.028
L026	GI-23	1.45	1.38	1	0.006 †	0.007	0.259	0.039	0.969	0.426	0.333	1.35	0.026
L028	DE-23	1.48	1.57 †	1.07	0.065	0.006	0.286	0.043	1.02	0.438	0.349	1.36	0.031
L030	GJ-23	1.36	1.29	0.92 †	0.06	0.005	0.258	0.039	0.981	0.393	0.312	1.24	0.027
L032	GG-23	1.21 †	1.14 †	0.85 †	0.067	0.007	0.252 †	0.039	0.897				
L034	GC-23	1.46	1.31	1.02	0.064	0.007	0.281	0.044	0.976	0.403	0.358	1.32	0.03
L036	DE-23	1.39	1.34	1.01	0.066	0.005	0.286	0.042	1.05	0.405	0.326	1.28	0.028
L040	DE-23	1.47	1.36	1.01	0.067	0.006	0.275	0.045	1.03	0.413	0.326	1.31	0.032
L042	GF-38	1.4	1.43	1.03	0.054 †	0.004 †	0.269	0.041	0.986				
L045	GI-23	1.38	1.3	0.97	0.07	0.006	0.28	0.043	1.04	0.416	0.337	1.3	0.031
L064	GJ-23	1.49	1.55	1.05	0.07	0.02 †	0.28	0.054 †	1.03	0.414	0.333	1.29	0.035
L079	GJ-23	1.46	1.34	1.01	0.067	0.006	0.27	0.041	0.972	0.42	0.342	1.28	0.029
L080	GJ-23	1.71 †	1.61 †	0.99	0.009 †	0.006	0.271	0.04	0.971	0.272 †	0.231 †	1.4 †	0.022 †
L097	DE-23	1.5	1.37	1.04	0.065	0.005	0.283	0.044	1.04	0.418	0.315	1.3	0.028
L133	GG-23	1.45	1.29	0.05 †	0.937 †					0.44	0.353	1.37 †	0.033
L135	DN-23	1.42	1.32	0.96	0.062	0.006	0.275	0.042	0.992	0.399	0.311	1.2 †	0.027
L139	AD-23	1.46	1.29	1.05	0.073	0.01 †	0.307 †	0.05 †	1.12 †	0.457 †	0.286 †	1.32	0.033
L142	GH-09	0.0002 †	0.0001 ††	0.0001 ††		0.01 †	0.13 †	0.02 †	0.61 †	0.7 †	0.59 †	2.08 †	0.04 †
L156	GI-24	1.67 †	1.41	0.99	0.066	1.74 †	1.44 †	1.02 †	0.067 †	0.56 †	0.496 †	1.5 †	0.111 †
L164	GJ-11	1.51	1.37	1.04	0.066	0.006	0.343 †	0.047 †	1.06				
L165	GG-23	1.5	1.4	1.1 †	0.07		0.28	0.04	1.08	0.425	0.34	1.32	0.03
L178	DE-23	1.44	1.35	0.99	0.065	0.006	0.278	0.044	1.01	0.416	0.324	1.32	0.032
L179	GH-23	1.42	1.7 †	1.03	0.07	0.007	0.245 †	0.04	0.905	0.444	0.373 †	1.49 †	0.035
L186	DE-23	1.46	1.24	1.02	0.659 †	64.2 †	2989 †	449 †	11174 †				
L189	GI-23	1.42	1.29	1.02	0.07	0.005 †	0.275	0.042	1.03	0.417	0.332	1.25	0.030
L192	DE-23	1.5	1.36	1.05	0.064	0.005	0.283	0.042	1.02	0.437	0.34	1.32	0.029

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Carbon (%C)											
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
L009	CA-37	43.8	40.1	44.1	44.9	40.8 †	44.8	40.9 †	47.5	49.5	40	43.2	42.9
L013	CA-37	47.1 †	40.9 †	46.5 †	46.7	44	45.7	44	48	50.7	41.5	44.4 †	43.8
L015	CA-37	44.4	39.3	43.9	44.8	43.8	45.3	43.5	47.4	49.6	40.6	43.4	43
L018	CA-37	45.2	40	44.3	45.6	43.3	45	42.8	48	50.1	41.1	43.7	43.2 †
L019	CA-37	45.4	40.7	45.3	45.8	41.9 †	44 †	42 †	46.2	48.5	39.3	42.1 †	41.7
L022	CA-37	43.8	38.9	44.1	44.9	43.1	45.1	43.4	47.9	49.5	39.8	42.9	43.1
L023	CA-37	43.3	38.3 †	42.6 †	43.2 †	43.2	45.2	43.4	47.7	48.5	39.4	42.2 †	41.5
L028	CA-37	45.2	40.3	44.7	46	43.9	45.3	43.7	47.6	49.8	41	43.6	43.2
L030	CA-37	44.7	39.9	44.3	45.7								
L032	CA-37	44.5	39.4	44.2	45.1	44.2	45.8	43.7	47.7	48.4 †	39.3	42.4 †	41.4
L036	CA-37	43.8	39.3	42.8 †	44.6	43.8	45	43.1	47	49.5	41.3	43.6	43.5
L040	CA-37	44.2	39.9	44.6	45.2	44.0	45.2	43.1	47.5	49.6	42.5	43.4	42.3
L042	CA-37	44.6	39.5	44.4	45.8	43.7	45.4	43.2	47.4	50.4	41	43.9	43.8
L064	CA-37	44.9	39.4	43.9	45.2	42.5 †	44.4 †	42.7	46.8	49.2	40.2	43.5	42.8
L079	CA-37	44.5	39.5	43.6	44.3	41.8 †	43.6 †	42.3 †	46.2	49.4	40	43.3	42.2
L097	CA-37	44.4	39.6	44.4	45.1	43.7	45.5	43.8	47.9	47.4 †	38.7	41.3 †	40.8
L135	CA-37	43.6	38.5 †	43.5	42.6 †	46.4 †	44.9	42.2 †	45.1 †	47.3 †	38.8	41.6 †	41
L156	CA-37	44.9	40.1	44.7	45.7	43.8	45.2	43.5	47	49.9	41.2	43.8	43.2
L165	CA-37	45	40	45	46								
L178	CA-37	44.1	39.7	44.5	45.1	44.0	44.8	43.2	47.2	49.7	42.6	43.4	42.2
L186	CA-37	45.1	39.5	44.6	45.9	44.5	46.1 †	44.5 †	48.3				

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Chloride (mg Cl/kg)																			
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)											
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44								
L009	BB-32	2890	5340	5070	470	683	7720	213	†	741	1580	4560	7300	1610							
L011	BB-31	3340	†	5760	†	5630	†	103	†	213	8380	†	327	†	988	†	1391	4814	7560	759	†
L013	CA-37	2900	4850	5050	500	400	7800	600		750	1450	4850	7350	1500							
L018	BA-32	2990	5060	5290	644	†	556	7773		820	†	932	†	1720	5100	7430	1700				
L019	BB-31	3280	†	5910	†	4840	404	400	7850	970	†	1320	†	3530	†	5560	†	8255	†	1293	
L022	BB-31	2996	4995	5010	481	502	7510	652		753	1560	4730	7100	1640							
L023	BB-38	3000	5160	5040	411	364	7430	565		743	1300	4950	7010	1350							
L026	BB-31	2940	4770	5080	512	502	6990	†	590	779	1422	4642	6819	1325							
L028	DE-23	2590	†	4760	4710	560	540	7540	670	850	1300	4640	7130	1260							
L030	BB-31	2760	4730	4840	441	358	7567	548		773	1339	4877	7449	1386							
L034	BA-32	3010	5030	5180	525	460	7770	660		790	1520	4950	7440	1530							
L036	BB-31	0.322	†	0.56	†	0.54	†	0.43	†	328	7518	533	905	†	1526	5418	†	7241	1295		
L040	BB-32	2840	4630	5040	456	335	7760	610		728	1525	4850	7268	1468							
L045	GI-23	2840	4550	4200	†	561	453	6270	†	672	1080	†	1858	†	4801		6782	1589			
L064	BB-27	2950	8810	†	5640	†	570	550	7810	1630	†	900	†	1495		5215	7290	2365	†		
L097	BA-32	3011	4920	5025	500	420	7760	583		780	1363	4496	6850	1377							
L135	BB-32	2650	†	4350	5375	700	†	950	†	5825	†	900	†	675	396	†	1980	†	6730	396	†
L139	BB-31	3584	†	6054	†	5462	522	450	7166	†	733	1199	†	1726		5454	†	7422		1458	
L164	BB-38	2530	†	4350	4350	†	445	335	7082	†	610	488	†								
L178	BB-32	2867	4650	5063	458	330	7710	598		726	1520	4857	7274	1492							
L179	BA-31	0.38	†	0.63	†	0.55	†	0.06	†	480	7560	595	1590	†	2210	†	6850	†	9110	†	1400
L189	BA-23	3020	4990	5140	442	394	7940	522		742	1480	4780	7410	1460							

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Cobalt ($\mu\text{g Co/kg}$)											
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
L009	GJ-23	64	239	237	244	9.36 †	47.6	55.6	84.2	81.7	19.2	191	8.11
L011	GJ-23	12.4 †	180	143 †	79.7	8.03	18.3 †	27.4 †	88.3	81	0.356 †	175	6.52
L013	DN-23	56	294	229	253	4	48	58	99	85.5	26	203	6
L019	DE-24	115 †	296	220	148	12.3 †	44.4	51	77	88.6	20.9	189	3.36
L022	DE-24	64.3	301	239	263	3.8	48.9	49.6	89.1	85.3	27.8	192	8.6 †
L023	DN-24	66.9	304	231	266	1.85	34.3 †	55.4	86.8	81.2	25	181	4.18
L026	GI-23	52.2	342	259	1560 †	5	50	55.7	87.3	79.7	27.3	183	7.33
L028	DE-24	65.3	342	242	715 †	5.33	42	57.7	83.3	84.7	22.3	205	3.33
L032	GG-24	72.6	393	314 †	87.4	4.78	45.4	60.1	92.7				
L040	DE-24	69.5	300	245	263	2.8	47.5	49.8	81.6	84.1	39.6 †	190	3.5
L079	GJ-23	68	355	251	192	5	41	33 †	89	91	34	218	6
L097	DE-24	57.7	365	281 †	272	1.81	46.1	63	79.6	81.6	18.8	177	4.34
L133	GG-23	36 †	278	350 †	210					84	28	205	17 †
L135	DN-23	18.8 †	268	196 †	316	29.2 †	58.4 †	78.8 †	123 †	125 †	51.2 †	218	52.5 †
L139	AD-23	61.7	253	194 †	469 †	0.8	35.6	63.8	85.8	84.2	21	158 †	4.4
L178	DE-24	70.5	292	235	258	3.1	47	50.2	81	83.6	39.4 †	192	3.45
L179	GH-23	118 †	361	276	310	21 †	76 †	77 †	134 †	96.5 †	45.5 †	184	19.5 †
L189	GJ-24	78.8	415	290 †	373	1.79	37.2	56.9	82.2	83.3	22.4	187	4.57
L192	DE-24	42.7	295	240	395	3.38	45.1	56.1	94.5	89.8	25.1	196	2.64

Lab. Code#	Method Codes	Plant sample identification and values for 2012-13: Copper (mg Cu/kg)													
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)					
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44		
L002	AD-09	7.75 †	2.43 †	9.6 †	4.23 †	2.1 †	7.55	7.3	9.35 †	7.5 †	1.55 †	0.9 †	2.9 †		
L005	GI-23	12.4	8.76	17.3	10.1										
L007	AD-13	12.3	4.25 †	15 †	4.75 †	2.5 †	9.75 †	7.25	17.5 †	7.25 †	1.98 †	7.53 †	3.48		
L009	GJ-23	14	8.51	17.9	10.9	1.84	7.31	7.01	11.6	6.45	4.26	5.89	4.53		
L011	GJ-23	13.7	8.98	17.4	9.96	1.33	7.3	6.81	11.6	6.88	4.38	6.34	4.01		
L013	DN-23	12.3	7.79	16.7	9.2	1.69	7.18	7.27	12	6.7	4.34	6.49	4.16		
L015	GJ-23	13.1	8.61	18.6	10.9	1.44	7.03	6.98	11.4	6.38	4.03	5.74	4		
L018	GJ-23	14	9.45	19	12.1	1.56	7.15	7.36	12.3	6.81	4.3	6.17	4.17		
L019	DE-24	13.7	8.8	18.3	11.2	1.25	6.62	6.92	11.6	6.21	3.9	5.48	3.78		
L022	DE-23	13.8	9.54	18.5	10.9	1.43	7.45	7.1	11.7	6.49	4.09	5.95	3.82		
L023	DN-23	12.9	8.35	17.2	10.9	1.36	6.44	6.8	11	6.19	3.75	5.53	3.71		
L026	GI-23	13.7	9.1	18.2	11.6	1.36	7.08	6.84	11.9	6.49	3.84	5.73	3.67		
L028	DE-24	14.9	11.4 †	20.3 †	13.7	1.62	7.87	7.76	12.7	6.93 †	4.47	6.3	4.07		
L030	GJ-23	10.9 †	7.46 †	14.5 †	8.87	1.16	5.83	6.1	10.1	5.41 †	3.55	5.02 †	3.32		
L032	GG-23	14.6	9.57	18.6	12.2	1.58	7.14	7.03	11						
L034	GC-23	14.1	8.74	18.5	10.8	1.12	6.72	6.7	11.5	6.44	4	5.95	3.73		
L036	DE-23	12.8	9.08	18	10.5	1.58	7.62	7.5	12.6	6.4	4.17	6.11	3.83		
L040	DE-23	13.9	8.71	18.9	10.5	1.48	7.46	7.52	12.1	6.47	4.77	5.89	4.21		
L042	GI-38	16.7 †	10.3 †	19.1	12.9	2.25 †	5.89	5.4 †	10.2						
L045	GI-23	14.7	10.4 †	19.1	13.1	1.66	8.13	7.77	12.7	7.25 †	5.06 †	7.17 †	4.57 †		
L064	GJ-23	12.4	13 †	17.4	12	3.35 †	7.08	7.34	10.6	6.35	4.88 †	6.08	4.42		
L079	GJ-23	12.7	8.53	16.3	8.96	1.39	6.5	6.59	10.8	6.3	3.92	5.66	3.59		
L080	GJ-23	12.7	10.1 †	18.3	6.25 †	2.15 †	6.44	6.5	10.1	4.54 †	3.63	7 †	3.9		
L097	DE-23	13.6	8.78	17.9	11.5	1.56	7.95	7.32	12.1	6.57	4.04	6	3.93		
L133	GG-23	13.6	8.3	10.9 †	14.8 †					6.6	4	5.98	3.77		
L135	DN-23	11.9	8.02	15.8 †	9.25	1.37	6.35	6.63	10.7	6.47	4.14	5.92	3.75		
L139	AD-23	10.2 †	2.08 †	16.7	1.12 †	0.492 †	5.83	7.28	12.7	6.69	1.17 †	5.46	3.18 †		
L142	GH-09	12.8	8.43	17.9	9.44	1.56	6.4	6.47	10.6	5.99 †	3.69	5.4	3.3		
L156	GI-24	21.6 †	12.8 †	24 †	13.7	0.754 †	8.95 †	7.82	17.2 †	9.77 †	6.87 †	9 †	6.75 †		
L164	GJ-11	11.8	8.5	15.6 †	8.28	2.61 †	6.46	8	10.9						
L165	GG-23	13	8	17	11	1.4	7.5	7.1	12	6.35	3.95	6.1	3.47		
L178	DE-23	13.8	8.74	18.9	10.8	1.51	7.42	7.52	11.9	6.51	4.79 †	5.92	4.19		
L179	GH-23	13.1	10.6 †	18.1	9.73	1.6	6.1	6.7	11.3	6.3	4.6	6.98 †	3.95		
L186	DE-23	15.4	10.3 †	21 †	11.7	1.35	6.35	6.49	12.7						
L189	GJ-23	13.7	8.71	18.4	10.9	1.64	6.67	7.53	12.4	6.43	4.09	6.01	3.91		
L192	DE-23	12.7	8.85	18	17.4 †	1.24	8.51	6.81	11.8	6.62	4.02	6.15	3.99		

Lab. Code#	Method Codes	Plant sample identification and values for 2012-13: Iron (mg Fe/kg)													
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)					
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44		
L002	AD-09	110 †	334 †	231	81.5 †	16.2	65.2 †	75.2 †	98.8 †	110 †	16.6 †	29.7 †	123 †		
L005	GI-23	74.9	507	185	33.2 †										
L007	AD-13	53.3 †	502	165 †	34 †	14.8	71.8 †	38.8 †	91.3 †	59.8 †	13.3 †	151 †	36.7 †		
L009	GJ-23	77	400	209	45	27.3 †	105	53.7	122	88.5	25.8 †	230	36.8 †		
L011	GJ-23	73.5	471	187	41	20.5	101	41	114	95.5	23	238	31.6		
L013	DN-23	68.1 †	455	204	41.6	15.3	105	47.4	124	84.7	19.5	217	30.1		
L015	GJ-23	75.9	500	223	48.3	17.6	105	45.3	118	89.4	23.8	223	30.3		
L018	GJ-23	84.5 †	525	257 †	50.2	18.3	98.3	49.1	125	92.3	22.1	234	31		
L019	DE-24	76.2	545	201	38.2	51 †	121	81.4 †	145 †	90.3	30.3 †	232	30.5		
L022	DE-23	78.5	459	209	45.9	15.3	107	45.9	121	92.3	22.3	229	31.5		
L023	DN-23	73.7	467	203	43.7	19.2	96.2	45.3	128	91.3	20.1	264 †	28.8		
L026	GI-23	75.8	476	212	46.6	16.4	97	44.9	113	92.9	19.6	217	29.8		
L028	DE-24	79.6	538	214	44.5	16.9	106	45.2	116	91.7	20.1	242	29.8		
L030	GJ-23	85.4 †	528	196	38.2	14.4	97	43.2	131	93.5	27.2 †	241	27.6		
L032	GG-23	63.2 †	409	154 †	13.1 †	12.4	76.8 †	17.8 †	91.7 †						
L034	GC-23	74.1	452	202	44.2	17.2	104	37.9 †	118	90.9	24.1	234	30.5		
L036	DE-23	74.7	484	204	43	20.2	108	44.2	126	94.7	22.1	245	28.9		
L040	DE-23	77.3	494	208	45.9	16.1	106	49.3	123	88.1	21.2	233	31.6		
L042	GI-38	87.6 †	539	221	51	16.4	118	49.6	137 †						
L045	GI-23	77.9	430	184	49.5	18.8	105	49.1	114	81 †	23	193 †	30.7		
L064	GJ-23	75.4	421	214	50.3	39.2 †	103	49.7	112	88.3	28.4 †	233	36.6 †		
L079	GJ-23	78.6	448	198	45.1	17.4	106	44.6	120	88.3	21.1	207 †	28		
L080	GJ-23	70.8	479	207	35	28.2 †	95.3	52.8	121	63 †	19	239	22 †		
L097	DE-23	82.1	468	217	44.3	17.3	111	47.2	118	92.2	21.6	224	29.4		
L133	GG-23	77.6	479	43.9 †	178 †					99.3	20.3	242	29.5		
L135	DN-23	78.6	441	193	46.2	19	106	51.1	125	95.8	22.3	239	32.5		
L139	AD-23	51.5 †	285 †	170 †	45.7	15.4	47.1 †	50.1	96.4 †	70.7 †	14.6 †	158 †	32.5		
L142	GH-09	81.3	440	228	37.1	12.4	86.6 †	41.7	112	99.2	20.9	199 †	24.8 †		
L156	GI-24	93.3 †	421	166 †	29 †	3.82 †	137 †	45.1	194 †	117 †	37.6 †	280 †	41.5 †		
L164	GJ-11	72.4	325 †	170 †	42	22.6	117	53.6	127						
L165	GG-23	65 †	370 †	180	40	17.2	110	47.5	111	88	19	220	30		
L178	DE-23	76.2	490	211	45.4	16.1	103	48.6	119	88.7	21.2	235	31.6		
L179	GH-23	82.5	629 †	237	49.1	18.4	99	46.8	125	94.2	26 †	259 †	33.7 †		
L186	DE-23	85.9 †	473	218	49.8	19.4	93.4	46.4	115						
L189	GJ-23	76.7	470	230	48	17.8	100	47.7	121	91.9	20.2	235	29.5		
L192	DE-23	75.9	462	213	45.8	19.4	112	48.1	128	95.5	20.9	236	29.7		

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Lead ($\mu\text{g Pb/kg}$)												
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)				
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44	
L009	GJ-23	121	312	157	42.8	204 †	233	202 †	130	227	135	120	198 †	
L011	DE-23	256 †	323	174	72.6	81.7 †	236	75.3 †	106 †	172	112	103	77.3	
L013	DN-23	103	460	125	14.9	4	236	2	124	202	104	113	33.4	
L019	DE-24	118	455	154	42.4	20.9	180 †	23.4	125	218	149	119	22.8	
L022	DE-24	118	453	149	43.6	28.2	238	27.6	131	226	134	129	18	
L023	DN-24	95.1	455	136	20.2	2.04	136 †	4.07	123	189	116	110	3.2	
L028	DE-24	106	562	142	24.9	13.3	260 †	26.7	133	270	133	127	5.47	
L032	GG-24	75.8	289	94.4 †	47.6	24.7	214 †	32.3	127					
L040	DE-24	120	471	154	55.8	33.1	230	24.8	122	224	164	129	50.7	
L079	GJ-23	199 †	274	100 †	97	44	256	51	151 †	192	88	36 †	77	
L133	GG-23	328 †	290	312 †	226 †					262	205	112	34	
L165	GG-23					250 †	740 †	200 †	200 †	400 †	250	350 †		
L178	DE-24	125	465	149	57	32.6	232	25.3	120	222	165	126	50.2	
L189	GJ-23	477 †	634	311 †	285 †									
L192	DE-24	95.4	482	147	26.9	4.42	246	5.78	153 †	220	45.6	609 †	254 †	

Code #	Method Codes	Plant sample identification and values for 2012-13: Magnesium (%Mg)																								
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)																
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44													
L002	AD-09	0.301	0.62	0.19	0.124	0.104	0.125	0.106	0.3	0.079	†	0.046	†	0.219	0.081											
L005	GI-23	0.288	0.59	0.18	†	0.118																				
L007	AD-13	0.24	†	0.55	0.22	0.128	0.099	0.13	0.11	0.306																
L009	GJ-23	0.281	0.52	0.20	0.13	0.091	0.12	0.097	0.301	0.068	0.078	†	0.21	0.079												
L011	GJ-23	0.278	0.57	0.19	0.126	0.09	0.119	0.100	0.302	0.065	0.087	0.208	0.076													
L012	GE-11	0.253	†	0.53	0.17	†	0.102	†																		
L013	DN-23	0.295	0.59	0.21	0.143	0.1	0.119	0.108	0.294	0.069	0.092	0.205	0.092													
L015	GJ-23	0.303	0.61	0.22	0.143	0.096	0.123	0.103	0.317	0.066	0.088	0.201	0.081													
L018	GJ-23	0.289	0.59	0.21	0.139	0.092	0.116	0.099	0.297	0.068	0.091	0.208	0.085													
L019	BB-31	0.295	0.62	0.22	0.144	0.080	†	0.101	†	0.086	†	0.286	†	0.068	0.095											
L022	DE-23	0.283	0.55	0.21	0.139	0.093	0.122	0.101	0.305	0.067	0.09	0.21	0.086													
L023	DN-23	0.267	†	0.54	0.19	0.125	0.090	0.11	0.098	0.291	0.069	0.09	0.208	0.084												
L026	GI-23	0.289	0.59	0.20	0.128	0.093	0.117	0.098	0.305	0.068	0.09	0.212	0.082													
L028	DE-23	0.303	0.63	0.22	0.137	0.097	0.128	0.106	0.315	0.071	0.096	0.223	†	0.089												
L030	GJ-23	0.264	†	0.53	0.18	0.126	0.09	0.111	0.097	0.291	0.062	†	0.082	0.194	†	0.078										
L032	GG-23	0.291	0.54	0.2	0.135	0.092	0.114	0.837	†	0.281	†															
L034	GC-23	0.295	0.58	0.20	0.129	0.089	0.12	0.099	0.284	†	0.066	0.098	0.207	0.089												
L036	DE-23	0.268	†	0.56	0.2	0.129	0.095	0.126	0.105	0.315	0.065	0.089	0.202	0.082												
L040	DE-23	0.286	0.57	0.20	0.13	0.101	0.123	0.111	0.306	0.067	0.087	0.213	0.085													
L042	GF-38	0.296	0.57	0.21	0.145	0.086	0.113	0.093	0.314																	
L045	GI-23	0.294	0.58	0.20	0.137	0.096	0.125	0.103	0.306	0.071	0.095	0.22	0.088													
L064	GJ-23	0.29	0.6	0.20	0.137	0.098	0.123	0.102	0.306	0.067	0.089	0.21	0.078													
L079	GJ-23	0.263	†	0.54	0.19	0.123	0.089	0.115	0.097	0.288	†	0.069	0.094	0.216	0.086											
L080	GJ-23	0.358	†	0.58	0.20	0.068	†	0.092	0.122	0.101	0.296	0.053	†	0.072	†	0.26	†	0.068	†							
L097	DE-23	0.283	0.61	0.21	0.135	0.099	0.125	0.108	0.317	0.069	0.088	0.208	0.082													
L133	GG-23	0.308	†	0.61	0.12	†	0.208	†				0.071	0.098	0.23	†	0.091										
L135	DN-23	0.286	0.58	0.20	0.123	0.093	0.119	0.101	0.303	0.066	0.087	0.206	0.08													
L139	AD-23	0.285	0.56	0.21	0.138	0.105	0.13	0.113	0.328	†	0.07	0.076	†	0.218	0.09											
L142	GH-09	0.0000	†	0.00	†	0.00	†	0.000	†	0.08	0.1	†	0.09	0.31	0.07	0.08	†	0.2	0.08							
L156	GI-24	0.351	†	0.30	†	0.33	†	0.155	0.129	†	0.209	†	0.156	†	0.543	†	0.127	†	0.162	†	0.324	†	0.158	†		
L164	GJ-11	0.29	0.61	0.2	0.12	0.085	0.118	0.095	0.31																	
L165	GG-23	0.32	†	0.58	0.22	0.14	0.1	0.13	0.11	0.31			0.07		0.09		0.23	†	0.09							
L178	DE-23	0.29	0.58	0.20	0.134	0.102	0.12	0.107	0.303	0.067	0.087	0.212	0.086													
L179	GH-23	0.295	0.67	†	0.22	0.145	0.09	0.11	0.095	0.27	†	0.07	0.101	†	0.233	†	0.087									
L186	DE-23	0.275	0.49	†	0.20	0.135	836	†	1039	†	882	†	2673	†												
L189	GI-23	0.288	0.55	0.20	0.14	0.1	0.12	0.104	0.31		0.069	0.090	0.207	0.085												
L192	DE-23	0.284	0.57	0.20	0.125	0.093	0.125	0.1	0.306	0.07	0.092	0.215	0.085													

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Manganese (mg Mn/kg)											
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
L002	AD-09	52.9 †	50.9	49.8 †	44.9	4.65 †	62.4	9.1	75.7	102	1.4 †	0.6 †	22.7 †
L005	GI-23	1950	50.8	26.6 †	42.7								
L007	AD-13	1083 †	50.5	30	49.3	3.5	63.8	9.75	73.8 †	127 †	16.9 †	52.6 †	7.88 †
L009	GJ-23	1990	51.9	28.6	47	3.88	69.8	10.8	83.3	102	11.7	33.3	6.87
L011	GJ-23	2080	55.6	27.4	45.9	3.56	68.7	9.5	78.7	98.3	12.7	32.5	5.76
L013	DN-23	1891	71.8 †	27.6	45.4	4.95 †	67.4	10.5	77.4	99.8	13.8	32.3	6.84
L015	GJ-23	1940	55.7	29.5	47.9	3.7	68.9	9.66	78.7	101	12.9	30.8	6.11
L018	GJ-23	2110	60	31.9	51.3	3.86	69.8	10.1	81.2	108	13.9	33.2	6.92
L019	DE-24	2109	60.2	31	48.8	3.24	64.4	9.4	77.8	104	13.5	33.8	6.48
L022	DE-23	1989	57	29.8	47.5	3.65	71.5	10.2	81.1	106	13.8	33.5	6.65
L023	DN-23	1880	54	28.4	45.7	3.69	66.8	9.74	79.5	105	12.6	34.7	6.45
L026	GI-23	1930	56.2	29.9	48.7	3.58	69.3	9.61	80	106	12.4	30.6	6.19
L028	DE-23	2110	59.6	31.1	46.9	3.97	75.2	10.3	83.6	108	13.1	34.7	6.7
L030	GJ-23	1960	50.2	25.1 †	44.5	3.41	64.3	9.23	73.5 †	95.3 †	12.1	30.2 †	5.81
L032	GG-23	2080	47.1 †	25.9 †	43.9	3.18	64.4	8.79	70.5 †				
L034	GC-23	1980	54.3	29.2	46.3	3.67	72.5	10.1	79.2	101	14.9 †	34.2	6.8
L036	DE-23	1934	53.4	29.5	47.3	3.73	72.8	10.2	83.1	102	13.2	34.1	6.26
L040	DE-23	1956	52.9	28.5	46.7	2.81 †	71.2	9.76	79.6	105	12.3	33.5	5.95
L042	GI-38	2080	68 †	35.8 †	56.4 †	3.32	64.1	9.08	63.5 †				
L045	GI-23	1930	52.6	27.9	15.3 †	3.08	67.8	9.07	78.8	93.8 †	11.8	29.7 †	5.65
L064	GJ-23	2200	42 †	30.1	46.8	1.53 †	66.1	2.42 †	82.2	103	12.4	33.3	7.59
L079	GJ-23	2060	55.1	29.1	49.1	3.72	70.2	9.85	79.5	102	13.7	33.4	6.4
L080	GJ-23	1366 †	66.0 †	29.2	31 †	4.5 †	67	10.2	74 †	82 †	9.85 †	42 †	4 †
L097	DE-23	2344 †	55.6	29.1	46	3.77	70.4	10.3	80.7	102	12.7	32.2	6.11
L133	GG-23	2041	48.8	46.5 †	21 †					109	10.5 †	31.6	275 †
L135	DN-23	1813	53.7	29.2	47.8	3.89	72.4	10.4	81.6	111 †	13.3	33.6	6.6
L139	AD-23	1926	48.7	29.8	51.8 †	4.07	75.3	11.5 †	87.7 †	112 †	11	32.1	7
L142	GH-09	1881	54.8	28.6	37.1 †	3.31	64.4	8.52	80.8	89.8 †	11.3	28.2 †	4.48 †
L156	GI-24	3500 †	83.1 †	41 †	66.5 †	5.25 †	47 †	15.9 †	59.4 †	211 †	108 †	129 †	98 †
L164	GJ-11	1880	48	30	44	3.75	76.7	10.7	86.2 †				
L165	GG-23	1820	49	27	45	71.3 †	3.7 †	9.8	81.1	100	12.6	32.4	6.1
L178	DE-23	1973	52.7	29.1	46.9	2.87 †	70.8	9.81	81.2	103	12.3	33	5.89
L179	GH-23	2340 †	68.5 †	32.2 †	51.5 †	3.8	69.7	9.8	80.4	101	14.3	34.7	6.97
L186	DE-23	1900	54.6	30.2	47	3.43	64.7	9.14	2672 †				
L189	GJ-23	2060	54.9	30.4	51.2	3.93	71.8	10.4	82.7	108	12.8	32.6	6.65
L192	DE-23	2006	55.6	30.4	46	3.95	76.5	10.3	86	104	12.3	32.9	6.07

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Molybdenum ($\mu\text{g Mo/kg}$)											
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
L009	GJ-23	110	707	839	479	168	150	2390	189	236	77.6	599	330 †
L011	GJ-23	148 †	706	856	499	86.1 †	181 †	2700	178	241	155 †	694	387 †
L013	DN-23	127	785	843	448	139	154	2287	176	200	51.5	620	272
L018	GJ-23	342 †	953 †	991 †	700 †	466 †	342 †	2510	368 †				
L019	DE-24	135	698	831	474	11.5 †	22.2 †	1780 †	37 †	227	46.4	531	232
L022	DE-24	102	695	845	473	125	151	2190	179	220	51.5	590	265
L023	DN-24	111	693	811	434 †	132	143	2260	163	189	22.9	559	230
L026	GI-23	100	738	833	415 †	143	170	2370	173	213	53	627	250
L028	DE-24	120	827	883	467	147	185 †	2600	190	257	60.3	640	290
L032	GG-24	194 †	1380 †	1300 †	466	166	180	2440	199				
L040	DE-24	103	686	841	468	138	152	2366	191	230	120	590	228
L045	GI-23	427 †	890	940 †	334 †	128	32 †	2110	480 †	474 †	174 †	540	210
L079	GJ-23	376 †	953 †	983 †	477	247 †	366 †	2069	550 †	448 †	267 †	898 †	270
L097	DE-24	105	780	876	471	140	172	2620	169	210	41.4	577	240
L133	GG-23	40 †	594	390 †	830 †					300 †	46000 †	528	270
L135	DN-23	39.5 †	602	741 †	395 †	165	153	2429	204	242	12.6	546	272
L139	AD-23	93.7	176 †	750 †	267 †	152	118 †	2477	201	62.6 †	11.4	59.4 †	29.9 †
L178	DE-24	116	693	837	474	138	151	2370	190	226	118	596	226
L179	GH-23	28.5 †	1060 †	1090 †	555 †	337 †	102 †	2220	271 †	85 †	79	685	86 †
L189	GJ-24	134	648	821	454	137	145	2400	171	208	40.5	566	239
L192	DE-24	106	755	880	443	111	150	2387	178	260	135	131 †	1.76 †

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Nitrate-nitrogen (mg N/kg)													
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)					
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44		
L009	BA-30	303 †	918 †	193	26.1 †	24 †	136	90.5 †	320 †	266 †	1320 †	379 †	47.5 †		
L011	BB-27	22	1690	137	0.1						139 †	134 †	962	133 †	
L019	BB-31				0.99	68.3 †	0.139	0.372		0.58	18.8	475 †	0.36		
L023	BB-31	32.5	1840	243	0.42	0.383	114	0.871	3.92	0.86	18.1	912	0.622		
L026	BB-31	42.8	2046	300	10.9 †	14.1 †	121	19.4 †	15.8	7.4	28.4	859	13.7 †		
L045	GI-23					139				6.97	19.6	909	10.3		
L064	ZZ-38	26.3	53.6 †	2.55	0.01	486 †	1061 †	810 †	10400 †	30	1194 †	675 †	1		
L097	BA-31	76.4 †	2320	294	0.001	0.001	181	0.001	0.001	0.001	0.001 †	959	0.001		
L139	BB-31	28.8	1937	248	5.4 †	0.001	117	2.54	4.7	14.5	22.7	833	13.7 †		
L179	BA-31	100 †	2050	50	300 †	50 †	150	50 †	50 †	50 †	50 †	950	50 †		
L192	DE-23									378 †	339 †	283 †	2.07		

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Nitrogen (%N)											
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
L002	GE-32	0.199 †	5.55 †	3.36 †	2.41 †	1.96 †	1.68 †	3.29	3.29 †	1.86	0.805	2.22 †	1.51
L007	GE-38	1.59	4.58	2.56	1.76	1.16	1.12	3.65	2.44	1.46 †	0.574 †	2.46 †	1.29 †
L009	CA-37	1.58	4.74	2.61	1.74	1.13	1.12	3.32	2.34	1.84	0.735	3.29	1.5
L011	CA-37	1.55	4.58	2.64	1.86	1.17	1.32 †	3.45	2.38	1.86	0.781	3.32	1.52
L012	GE-30	1.18 †	2.58 †	1.29 †	1.31 †								
L013	CA-37	1.6	4.84	2.75	1.88	1.21	1.12	3.69	2.51	1.94	0.769	3.51	1.59
L015	CA-37	1.57	4.7	2.62	1.78	1.2	1.12	3.57	2.41	1.86	0.786	3.35	1.55
L018	GK-31	1.5	4.5	2.57	1.83	1.24	1.1	3.54	2.4	1.8	0.712	3.13	1.49
L019	DE-24	1.5	4.73	2.68	1.8	1.13	1.14	3.31	2.33	1.79	0.749	3.28	1.45
L022	CA-37	1.51	4.62	2.62	1.79	1.09	1.15	3.43	2.35	1.85	0.81	3.26	1.54
L023	CA-37	1.42 †	4.48	2.52	1.73	1.13	1.07	3.43	2.36	1.76	0.673 †	3.23	1.46
L026	GE-31	1.47	4.46 †	2.51	1.81	1.2	1.12	3.52	2.37	1.93	0.79	3.47	1.62
L028	GE-31	1.55	4.79	2.64	1.81	1.19	1.1	3.54	2.39	1.84	0.744	3.33	1.56
L030	CA-37	1.52	4.69	2.67	1.86	1.23	1.15	3.65	2.51	1.92	0.793	3.4	1.6
L032	CA-37	1.49	4.68	2.63	1.81	1.19	1.09	3.54	2.39	1.81	0.732	3.33	1.47
L034	GE-31	1.55	4.29 †	2.56	1.85	1.19	1.09	3.56	2.36	1.88	0.8	3.31	1.56
L036	CA-37	1.54	4.66	2.56	1.85	1.28	1.13	3.65	2.53 †	1.92	0.817	3.31	1.61
L040	CA-37	1.5	4.68	2.61	1.78	1.18	1.1	3.49	2.36	1.85	0.872	3.3	1.59
L042	CA-37	1.55	4.72	2.62	1.88	1.22	1.15	3.55	2.47	1.94	0.793	3.49	1.6
L045	CA-37	1.54	4.52	2.59	1.76	1.13	1.22	3.32	2.29	1.84	0.78	3.41	1.5
L064	CA-37	1.52	3.88 †	2.48 †	1.79	1.2	1.17	3.55	2.43	1.86	0.851	3.22	1.55
L079	CA-37	1.56	4.68	2.63	1.82	1.12	1.12	3.39	2.35	1.92	0.749	3.41	1.5
L097	CA-37	1.48	4.71	2.62	1.82	1.24	1.18	3.68	2.46	1.8	0.749	3.45	1.49
L135	CA-37	1.59	4.62	2.75	1.88	1.25	1.35 †	3.45	2.47	1.9	0.73	3.34	1.45
L139	CA-37	1.48	4.73	2.55	1.7	1.15	1.08	3.64	2.47	1.81	0.694	3.34	1.46
L142	GE-32	1.25 †	4.08 †	2.3 †	1.6 †	0.99 †	0.95 †	3.1 †	2.06 †	1.69 †	0.61 †	2.89 †	1.37 †
L156	CA-37	1.55	4.74	2.7	1.86	1.23	1.17	3.57	2.43	1.9	0.816	3.48	1.59
L164	GE-32	1.39 †	4.38 †	2.55	1.73	1.22	1.08	3.51	2.31	1.81	0.72	3.14	1.52
L165	CA-37	1.65 †	4.58	2.61	1.93								
L178	CA-37	1.52	4.64	2.62	1.77	1.175	1.13	3.52	2.39	1.86	0.864	3.28	1.58
L179	GE-31	1.42 †	4.13 †	2.36 †	1.63 †	0.985 †	0.94 †	3.27	2.16 †	1.84	0.762	3.25	1.52
L186	CA-37	1.6	4.76	2.7	1.91	1.23	1.08	3.56	2.42				
L189	CA-37	1.53	4.7	2.64	1.83	1.17	1.22	3.36	2.39	1.89	0.773	3.41	1.53
L192	CA-37	1.54	4.7	2.59	1.84	1.13	1.16	3.4	2.39	1.53 †	0.794	3.52	1.55

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Phosphorus (%P)											
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
L002	GE-30	0.103	0.69 †	0.37 †	0.572 †	0.289	0.233	0.3	0.218	0.193 †	0.275	0.434 †	0.236
L005	GI-23	0.109	0.46	0.27	0.41								
L007	GE-30	0.115	0.45	0.26	0.378	0.39 †	0.22	0.31	0.22	0.165	0.26	0.327	0.263
L009	GJ-23	0.122	0.46	0.28	0.396	0.303	0.238	0.336	0.229	0.168	0.251	0.325	0.266
L011	GJ-23	0.118	0.46	0.26	0.391	0.303	0.244	0.33	0.233	0.157	0.255	0.313	0.248
L012	GE-30	0.019 †	0.06 †	0.03 †	0.025 †								
L013	DN-23	0.124	0.43 †	0.27	0.391	0.307	0.236	0.338	0.228	0.162	0.262	0.325	0.266
L015	GJ-23	0.127	0.48	0.29	0.427	0.297	0.24	0.328	0.226	0.165	0.27	0.32	0.26
L018	GJ-23	0.123	0.46	0.28	0.407	0.29	0.229	0.311	0.219	0.163	0.266	0.32	0.26
L019	CA-37	0.116	0.47	0.29	0.403	0.257	0.21	0.283	0.202	0.161	0.259	0.315	0.257
L022	DE-23	0.114	0.46	0.27	0.394	0.274	0.234	0.305	0.221	0.169	0.271	0.32	0.262
L023	DN-23	0.114	0.45	0.26	0.391	0.293	0.226	0.314	0.215	0.16	0.262	0.333	0.257
L026	GI-23	0.117	0.47	0.27	0.375	0.275	0.223	0.297	0.219	0.163	0.252	0.319	0.243
L028	GE-31	0.122	0.52 †	0.29	0.412	0.303	0.243	0.334	0.228	0.172	0.278	0.334	0.284 †
L030	GJ-23	0.102	0.43 †	0.23 †	0.355	0.26	0.206 †	0.288	0.202	0.145 †	0.239	0.285 †	0.231 †
L032	GG-23	0.111	0.29 †	0.27	0.386	0.274	0.217	0.294	0.204				
L034	GC-23	0.12	0.47	0.28	0.399	0.3	0.241	0.33	0.223	0.164	0.276	0.329	0.265
L036	DE-23	0.105	0.43 †	0.25	0.371	0.278	0.227	0.306	0.213	0.151 †	0.251	0.3 †	0.245
L040	DE-23	0.123	0.46	0.28	0.388	0.286	0.233	0.326	0.225	0.169	0.268	0.326	0.265
L042	GF-31	0.12	0.47	0.27	0.41	0.277	0.225	0.318	0.222				
L045	GI-23	0.113	0.45	0.26	0.392	0.295	0.236	0.322	0.223	0.15 †	0.246	0.296 †	0.244
L064	GJ-23	0.108	0.47	0.27	0.417	0.296	0.231	0.316	0.215	0.163	0.269	0.323	0.245
L079	GJ-23	0.115	0.46	0.26	0.377	0.262	0.224	0.293	0.216	0.163	0.274	0.325	0.246
L080	GJ-30	0.14 †	0.49	0.27	0.401	0.289	0.245	0.276	0.221	0.127 †	0.225 †	0.423 †	0.208 †
L097	DE-23	0.112	0.46	0.28	0.41	0.304	0.243	0.339	0.227	0.162	0.265	0.316	0.252
L135	DN-23	0.116	0.47	0.27	0.374	0.278	0.229	0.313	0.225	0.157	0.247	0.311	0.238
L139	AD-23	0.128	0.33 †	0.26	0.342	0.283	0.245	0.313	0.228	0.175 †	0.22	0.304 †	0.262
L142	GH-30	0.103	0.28 †	0.18 †	0.262 †	0.13 †	0.19 †	0.19 †	0.11 †	0.12 †	0.13 †	0.2 †	0.2 †
L156	GI-24	0.136 †	0.54 †	0.30 †	0.426	0.434 †	0.387 †	0.479 †	0.35 †	0.286 †	0.437 †	0.51 †	0.433 †
L164	GJ-30	0.12	0.47	0.27	0.38	0.286	0.227	0.315	0.213	0.142 †	0.24	0.309	0.243
L165	GG-23	0.12	0.49	0.3 †	0.39	0.29	0.23	0.32	0.22	0.16	0.27	0.34	0.27
L178	DE-23	0.117	0.47	0.28	0.382	0.281	0.235	0.329	0.229	0.167	0.266	0.328	0.262
L179	GH-23	0.125	0.54 †	0.29	0.42	0.27	0.21	0.28	0.205	0.16	0.287	0.341 †	0.265
L186	DE-23	0.105	0.40 †	0.24 †	0.352	2718 †	2192 †	2986 †	2070 †				
L189	GI-23	0.119	0.45	0.27	0.418	0.305	0.242	0.328	0.223	0.17	0.275	0.323	0.265
L192	DE-23	0.118	0.47	0.27	0.366	0.27	0.225	0.289	0.211	0.166	0.266	0.324	0.257

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Potassium (%K)											
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
L002	GE-09	0.994	7.92 †	1.9	0.456 †	0.458 †	1.83	1.15	1.51	0.549 †	2.81	3.03	0.379 †
L005	GI-23	0.879 †	7.04	1.73	0.357								
L007	GE-09	1.03	2.71 †	1.82	0.323	0.41	1.69	1.03	1.59				
L009	GJ-23	0.991	5.57	1.67	0.36	0.474 †	1.78	0.985	1.45	0.677	2.77	3.12	0.439
L011	GJ-23	1.13 †	6.61	1.67	0.525 †	0.553 †	1.82	1.08	1.49	0.791 †	2.27 †	2.5 †	0.492 †
L012	GE-11	0.641 †	1.7 †	1.88	0.406								
L013	DN-23	1.04	7.31	1.79	0.39	0.421	1.84	1.06	1.42	0.674	2.74	3.02	0.438
L015	GJ-23	1.03	7.05	1.96	0.417	0.406	1.96	1.08	1.58	0.706	2.92	3.28 †	0.46
L018	GJ-23	1.02	6.55	1.77	0.383	0.394	1.84	1.04	1.49	0.684	2.79	3.07	0.442
L019	DE-24	1.01	7.13	1.81	0.394	0.362	1.68	0.971	1.35	0.658	2.64	2.98	0.429
L022	DE-23	1.01	6.52	1.71	0.365	0.38	1.75	0.98	1.45	0.68	2.72	3.12	0.44
L023	DN-23	0.921 †	6.69	1.6	0.349	0.359	1.71	0.956	1.41	0.679	2.6	3	0.426
L026	GI-23	1.03	6.21	1.76	0.361	0.385	1.77	1.01	1.5	0.659	2.7	3.05	0.409
L028	DE-23	1.06	6.78	1.87	0.384	0.392	1.89	1.07	1.52	0.747 †	3	3.29 †	0.48 †
L030	GJ-23	0.815 †	5.57	1.44 †	0.341	0.364	1.64	0.927	1.36	0.642	2.51	2.76 †	0.41
L032	GG-23	0.904 †	6.27	1.6	0.361	0.342	1.55 †	0.837 †	1.21 †				
L034	GC-23	1.03	6.76	1.74	0.359	0.381	1.86	1.06	1.45	0.69	2.94	3.09	0.47 †
L036	DE-23	0.974	5.73	1.67	0.383	0.358	1.8	0.969	1.44	0.642	2.62	2.86 †	0.411
L040	DE-23	0.997	7.38	1.78	0.344	0.366	1.74	1.01	1.46	0.68	2.79	3.16	0.435
L042	GF-38	1.16 †	6.57	1.55	0.47 †	0.259 †	1.99	0.887	1.46				
L045	GI-23	0.94 †	6.34	1.65	0.371	0.373	1.78	1.01	1.44	0.676	2.76	3.05	0.442
L064	GJ-23	1.03	4.44 †	1.79	0.42	0.568 †	1.89	1.28 †	1.45	0.674	3.24 †	3.15	0.438
L079	GJ-23	0.946	6.29	1.61	0.343	0.34	1.65	0.923	1.37	0.642	2.7	3.05	0.407
L080	GJ-23	1.39 †	6.45	1.7	0.757 †	0.329	1.85	0.964	1.51	0.532 †	1.99 †	2.27 †	0.357 †
L097	DE-23	0.988	6.54	1.72	0.366	0.401	1.94	1.09	1.54	0.692	2.73	3.11	0.434
L133	GG-23	1.027	6.88	0.29 †	1.68 †					0.696	2.93	3.28 †	0.456
L135	DN-23	0.966	6.59	1.64	0.342	0.385	1.79	1.02	1.46	0.659	2.63	2.99	0.419
L139	AD-23	0.862 †	7.02	1.63	0.297 †	0.303 †	1.82	0.973	1.52	0.61 †	2.58	3.1	0.353 †
L142	GH-20	0.0001 †	0.005 ††	0.0002 ††	0.0001 ††	0.48 †	1.89	1.04	1.46	0.76 †	2.05 †	2.32 †	0.55 †
L156	GI-24	1.15 †		1.74	0.385	0.317 †	3.01 †	1.66 †	2.2 †	1.19 †	3.65 †	3.96 †	0.911 †
L164	GJ-11	1.02	7.3	1.62	0.38	0.378	1.89	1.06	1.5				
L165	GG-23				0.36	0.39	1.92	1.08	1.54	0.67	2.88	3.07	0.44
L178	DE-23	1.01	7.49	1.73	0.351	0.362	1.76	1.03	1.43	0.679	2.81	3.14	0.43
L179	GH-23	1.05	5.61	1.82	0.39	0.375	1.79	0.95	1.45	0.75 †	3.05	3.37 †	0.501 †
L186	DE-23					2452 †	10895 †	5747 †	9785 †				
L189	GI-23	1.02	6.92	1.82	0.381	0.398	1.88	1.05	1.52	0.715	2.86	3.14	0.439
L192	DE-23	0.968	6.76	1.68	0.34	0.365	1.8	0.993	1.45	0.702	2.86	3.20	0.441

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Selenium (mg Se/kg)															
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)							
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44				
L009	GJ-23	32.4	21.1	29.1	21.9	12.6	26.8	68.8	†	84.8	50.9	33	†	17	17.8		
L013	DN-23	34.3	22.3	24.9	17.2	13	25	515	†	89	49.5	138	19	9			
L019	DE-24	16.5	†	78.1	66.1	†	5.25	†	19.5	280	†	101	†	56.5	†		
L022	DE-24	34.6	112	32.5	23.5	16.7	142	†	549	91.2	54.5	201	19	20			
L023	DN-24	29.1	36.9	27.6	19.1	19.9	27.8	580		96.8	55.4	158	14.6	8.71			
L026	GI-23	44.6	60.2	31.3	12.6	33.7	51	†	457	†	86	49.7	137	24.3	†	10.3	
L028	DE-23	46.1	56.3	52.1	†	35.5	†	28	41.3	593	103	57.9	163	17.3	18.4		
L032	GG-24	74.9	†	232	†	80.8	†	66.3	†	30.3	53.5	†	666	†	122	†	
L040	DE-24	32.6	851	†	31.8	18.2	37.1	30.2		598	84.6	51.5	409	†	17.3	22	
L079	GJ-23	10	†	10	10	†	20	5	5	†	208	†	5	†	5	†	5
L097	DE-24	28.9	23.5	28	21.4	15.9	18.4	597		99.7	51.4	161	19.6	11.1			
L178	DE-24	33	861	†	31	18.6	36.9	29.2		604	85.6	51.3	413	†	16.3	21.6	
L179	GH-22	15	†	15	10	†	20	10	20	575	90	20	†	135	5	†	5
L189	GJ-24	43.1	79.7	55.3	†	23.2	18.1	30.1		576	98.6	49.6	147	14.4	8.74		
L192	DE-24	27.8	132	30.2	14.9	9.25	32.7	198	†	63	†	25.5	†	72.7	19.7	11.3	

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Silicon (%Si)																	
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)									
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44						
L009	DE-23	1.34	†	0.04	0.07	0.068	0.004	0.211	0.002	0.2	0.29	†	0.003	0.121	0.011				
L011	ZZ-23	1.82	0.19	†	0.50	†	0.061	0.018	†	0.402	†	0.013	†	0.151	0.018	†	0.005	0.008	0.012
L015	ZZ-23	1.7	0.48	†	0.81	†	0.105	0.003		0.69	†	0.006	†	0.265	0.03	0.005	0.206	0.022	
L019	CA-37	0.089	†	0.06	0.08	0.059	0.017	†	0.136	0.021	†	0.062		0.032	0.018	†	0.050	0.023	
L040	DB-31	1.86	0.05	0.12	0.089	0.005		0.24	0.003		0.217		0.029	0.002	0.124	0.075	†		
L133	GG-23											0.006	†	0.002	0.003	0.004			
L135	ZZ-23	0.869	†	0.25	†	0.57	†	0.107											
L178	DB-31	1.83	0.05	0.11	0.086	0.006		0.21	0.003	0.212	0.030	0.002	0.127	0.081	†				

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Sodium (%Na)											
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
L002	AD-09	0.017 †	0.24	0.06 †	0.01 †	0.005 †	0.076 †	0.003	0.011	0.041	0.231 †	0.061 †	0.025 †
L005	GI-23	0.007	0.20	0.02	0.002								
L007	AD-09	0.02 †	0.27	0.07 †	0.008 †	0.003	0.124 †	0.006 †	0.045 †	0.054 †	0.339 †	0.074 †	0.004
L009	GJ-23	0.009	0.27	0.03	0.003	0.008 †	0.09	0.01 †	0.008	0.041	0.232 †	0.049	0.011 †
L011	GJ-23	0.008	0.19	0.02	0.002	0.0002	0.075 †	0.002	0.007	0.036 †	0.258	0.045 †	0.006
L012	GE-11	0.018 †	0.09 †	0.11 †	0.31 †								
L013	DN-23	0.009	0.22	0.03	0.003	0.001	0.087	0.003	0.007	0.038	0.272	0.046	0.007
L015	GJ-23	0.01	0.24	0.03 †	0.005 †	0.002	0.098	0.004	0.008	0.043	0.287	0.049	0.006
L018	GJ-23	0.009	0.23	0.03 †	0.003	0.0005	0.093	0.003	0.008	0.062 †	0.297	0.049	0.005
L019	DE-24	0.009	0.23	0.03	0.003	0.0005	0.065 †	0.002	0.005	0.040	0.268	0.047	0.007
L022	DE-23	0.01	0.22	0.03	0.003	0.004	0.091	0.005 †	0.01	0.043	0.29	0.05	0.01
L023	DN-23	0.008	0.19	0.03	0.002	0.0005	0.085	0.002	0.006	0.038	0.261	0.045 †	0.006
L026	GI-23	0.009	0.22	0.02	0.002	0.001	0.089	0.003	0.007	0.039	0.281	0.046	0.006
L028	DE-23	0.008	0.26	0.03	0.002	0.002	0.099	0.004	0.008	0.045	3.08 †	0.052	0.007
L030	GJ-23	0.008	0.19	0.02	0.002	0.001	0.082	0.003	0.007	0.037	0.268	0.043 †	0.007
L032	GG-23	0.013 †	0.21	0.03	0.008 †	0.002	0.008 †	0.004	0.008				
L034	GC-23	0.009	0.21	0.02	0.002	0.001	0.092	0.004	0.008	0.04	0.304	0.048	0.008
L036	DE-23	0.008	0.25	0.03	0.002	0.0002	0.096	0.003	0.008	0.038	0.303	0.047	0.006
L040	DE-23	0.008	0.22	0.03	0.003	0.002	0.089	0.003	0.009	0.041	0.278	0.05	0.007
L045	GI-23	0.011	0.20	0.02	0.004	0.002	0.09	0.005 †	0.009	0.04	0.274	0.048	0.009
L064	GJ-23	0.01	0.23	0.03	0.003	0.003	0.086	0.004	0.008	0.038	0.279	0.049	0.005
L079	GJ-23	0.007	0.19	0.02	0.002	0.0002	0.079 †	0.003	0.006	0.04	0.29	0.05	0.007
L080	GJ-23	0.024 †	0.18	0.03	0.012 †	0.005 †	0.076 †	0.007 †	0.01	0.01 †	0.159 †	0.03 †	0.001 †
L097	DE-23	0.009	0.21	0.03	0.002	9.95 †	0.094	0.003	0.007	0.042	0.286	0.049	0.007
L133	GG-23	0.013 †	0.24	0.00 †	0.032 †					0.041	0.296	0.05	0.006
L135	DN-23	0.009	0.20	0.02	0.003	0.001	0.089	0.003	0.007	0.041	0.275	0.048	0.008
L139	AD-23	0.02 †	0.20	0.06 †	0.001	0.001	0.088	0.001 †	0.017 †	0.04	0.258	0.053 †	0.01
L156	GI-24	0.01	0.24	0.03	0.002	0.001	0.162 †	0.004	0.011	0.049 †	0.362 †	0.059 †	0.011 †
L164	GJ-11	0.014 †	0.21	0.03	0.007 †	0.003	0.097	0.003	0.006				
L165	GG-23						0.09		0.01	0.04	0.29	0.05	0.01
L178	DE-23	0.008	0.21	0.03	0.003	0.002	0.09	0.003	0.008	0.041	0.274	0.05	0.007
L179	GH-23	0.009	0.23	0.04 †	0.003	0.003	0.091	0.005 †	0.009	0.046 †	0.321	0.054 †	0.012 †
L186	DE-23	0.009	0.17	0.02	0.005 †	2.29 †	956 †	27.3 †	86.8 †				
L189	GI-23	0.008	0.23	0.02	0.002	0.00002	0.097	0.002	0.007	0.047 †	0.302	0.051	0.007
L192	DE-23	0.008	0.21	0.02	0.002	0.0001	0.089	0.003	0.007	0.042	0.295	0.052	0.009

Lab. Code#	Method Codes	Plant sample identification and values for 2012-13: Sulfur (%S)																				
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)												
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44									
L009	GJ-23	0.101	0.37	0.23	0.155	0.082	0.16	0.156	0.218	0.127	0.123	†	0.344	0.123								
L011	GJ-23	0.103	0.35	0.24	0.157	0.081	0.154	0.156	0.21	0.116	0.101	†	0.312	0.102								
L013	DN-23	0.097	0.33	0.24	0.15	0.089	0.157	0.162	0.21	0.122	0.11		0.324	0.106								
L015	GJ-23	0.116	†	0.39	0.29	†	0.18	†	0.093	0.175	0.178	0.241	0.136	0.122	†	0.362	0.123					
L018	GJ-23	0.106	0.36	0.25	0.159	0.084	0.152	0.156	0.214	0.126	0.111		0.329	0.112								
L019	DE-24	0.109	0.37	0.27	†	0.174	†	0.096	0.174	0.177	0.236	0.143	0.131	†	0.379	†	0.132	†				
L022	DE-23	0.104	0.33	0.24	0.153	0.079	0.159	0.16	0.21	0.127	0.11		0.33	0.115								
L023	DN-23	0.103	0.36	0.25	0.159	0.088	0.159	0.168	0.22	0.129	0.113		0.343	0.112								
L026	GI-23	0.105	0.36	0.25	0.156	0.088	0.167	0.166	0.231	0.132	0.109		0.334	0.111								
L028	DE-23	0.109	0.39	0.27	0.163	0.092	0.173	0.175	0.23	0.139	0.121	†	0.358	0.121								
L030	GJ-23	0.094	†	0.34	0.22	0.151	0.083	0.153	0.16	0.215	0.126	0.111		0.331	0.112							
L032	GG-23	0.103	0.32	0.24	0.151	0.077	0.144	0.143	0.189													
L034	GC-23	0.102	0.33	0.24	0.148	0.087	0.163	0.168	0.213	0.125	0.121	†	0.338	0.117								
L036	DE-23	0.091	†	0.33	0.23	0.147	0.081	0.154	0.157	0.21	0.122	0.111		0.326	0.109							
L040	DE-23	0.109	0.35	0.25	0.156	0.087	0.165	0.172	0.227	0.126	0.115		0.346	0.113								
L045	GI-23	0.109	0.37	0.26	0.167	0.096	0.172	0.176	0.236	0.122	0.108		0.319	0.107								
L064	GJ-23	0.1	0.32	0.24	0.153	0.094	0.168	0.173	0.228	0.127	0.113		0.341	0.106								
L079	GJ-23	0.111	†	0.33	0.23	0.133	†	0.069	†	0.142	0.14	0.201	0.114	0.107		0.327	0.098	†				
L080	GJ-23		0.38	0.24	0.21	†					0.094	†	0.088	†	0.407	†	0.088	†				
L097	DE-23	0.101	0.36	0.25	0.165	0.091	0.169	0.175	0.23	0.131	0.114		0.341	0.114								
L133	GG-23	0.119	†	0.31	0.13	†	0.229	†			0.125	0.113		0.338	0.111							
L135	DN-23	0.105	0.37	0.25	0.153	0.086	0.161	0.167	0.219	0.127	0.113		0.333	0.11								
L139	CA-37	0.085	†	0.22	†	0.19	†	0.145	0.089	0.168	0.146	0.19	0.135	0.111		0.337	0.116					
L156	GI-24	0.117	†	0.32	0.20	†	1.74	†	0.041	†	0.142	0.205	†	0.22	0.212	†	0.192	†	0.502	†	0.196	†
L165	GG-23	0.1	0.37	0.28	†	0.15	0.08	0.17	0.17	0.21	0.12	0.11		0.35	0.11							
L178	DE-23	0.111	†	0.35	0.24	0.159	0.088	0.161	0.174	0.225	0.129	0.114		0.344	0.117							
L179	GH-23	0.105	0.42	†	0.24	0.15	0.081	0.152	0.15	0.212	0.133	0.135	†	0.379	†	0.121						
L186	DE-23	0.092	†	0.31	0.22	0.143	945	†	1781	†	1881	†	2434	†								
L189	GI-23	0.103	0.34	0.25	0.162	0.088	0.163	0.165	0.22	0.132	0.115		0.331	0.113								
L192	DE-23	0.101	0.32	0.22	0.12	†	0.081	0.165	0.158	0.235	0.115	0.103	†	0.313	0.098	†						

Lab. Code #	Method Codes	Plant sample identification and values for 2012-13: Zinc (mg Zn/kg)											
		October 2012 (Round 112)				February 2013 (Round 312)				April 2013 (Round 512)			
		ASP 101	ASP 102	ASP 103	ASP 104	ASP 21	ASP 22	ASP 23	ASP 24	ASP 41	ASP 42	ASP 43	ASP 44
L002	AD-09	15.9 †	98.1	22.7	27.1	28.6 †	29.9 †	34.9	44.6 †	68.5	14.7	28.4 †	23.1
L005	GI-23	13.3	99.4	19.5 †	26.5								
L007	AD-13	13.8	77 †	28 †	23 †	21	24.3	62 †	40.8				
L009	GJ-23	12	83.2 †	22.2	28.1	37.6 †	26.8	35.4	42.7	72.6	15.2	20.5	25.5
L011	GJ-23	13.8	93.4	23.2	28.7	18.5	26.3	28.9	40.1	72.9	15.8	26.3 †	24.5
L013	DN-23	10.6	88.2	21.3	24.2	20.9	27.1	30.3	42.1	67.5	14.2	19.5	22.9
L015	GJ-23	12.3	90.6	23.5	28	20.1	25.5	29.6	41	70.1	15	20.2	23.5
L018	GJ-23	12.6	98.3	23.5	27.7	20.3	24.7	29.2	40.7	72.7	15	20.4	24.5
L019	DE-24	11.4	89.6	21.9	25.4	19.8	24.6	29.1	41.8	69.8	13.6	19.3	22.1
L022	DE-23	11.4	94.7	22.1	27.1	19.5	26.1	30.1	41.8	72.1	15.3	20.1	24.4
L023	DN-23	11.1	91.7	21.6	26.1	20	26	29.6	41.1	69.8	14.3	19.8	22.8
L026	GI-23	10.9	91.2	21.6	27.5	21.4	26.3	30.6	43.5	69.5	13.8	18.5 †	22.1
L028	DE-23	13.5	108 †	24.2	28.2	21.3	27.5	31.9	43.5	76.1	15.2	21.8	24.4
L030	GJ-23	10.1	90.6	19.3 †	25.5	19.1	23.8 †	29.1	39.2	67.2	12.9	18.5 †	22
L032	GG-23	11.8	90.4	22.8	27.8	19.4	23.9	27.4	36.6 †				
L034	GG-23	11.8	90.3	21.8	25.8	19.3	26	31.9	40.8	69.1	15.5	20.7	23.9
L036	DE-23	11	92.6	22.4	26.4	19.1	25.6	29	41.4	67.6	13.4	18.7	21.4
L040	DE-23	11.7	94.5	22.6	27.8	20.9	26.5	33.2	41.9	74.6	14.5	20.8	24.4
L042	GI-38	15.3 †	104 †	27.8 †	32.9 †	22.8	31.1 †	32.3	31.4 †				
L045	GI-23	13.8	94.3	23.1	29.7	20.3	26.9	31.2	42.3	65.7	13.7	19.1	22.6
L064	GJ-23	11.7	90.6	22.5	29.9	21.5	27.6	31.6	42	72.4	12.5	20.6	19.8 †
L079	GJ-23	11.8	96.6	22.6	28.7	21.4	26.6	31.5	41.5	74.5	15.2	21.4	25.1
L080	GJ-23	11.7	100	22	22 †	23	27	31	40	57 †	11 †	24 †	19 †
L097	DE-23	11	94	23.3	28.6	22.2	29.2 †	33.2	44.7 †	75.9	14.4	20.3	24.6
L133	GG-23	11.8	70.7 †	26.2 †	24					81.9	19.5 †	20.7	26.7
L135	DN-23	11.2	95.5	21.4	25.8	20.8	25.7	30.8	41.4	70.5	14.1	19.6	23.4
L139	AD-23	11	84.4	22.6	28.8	23.6	27.5	35.1	46 †	76.7	11.8 †	20.9	26.7
L142	GH-09	10.9	82.6 †	19.9 †	23.8 †	17.1 †	22.6 †	25.5 †	36.7 †	66.6	10.8 †	17.1 †	17.6 †
L156	GI-24	21 †	130 †	31.2 †	36.5 †	30.3 †	50.4 †	50.4 †	81.6 †	29.1 †	49.9 †	49 †	80.1 †
L164	GJ-11	13.2	95.3	22.8	26.4	19.8	24.1	26.4	27 †				
L165	GG-23	14	89	25 †	30	21.9	28.3	32.4	43.5	71.1	14.1	19.9	24
L178	DE-23	11.6	96.6	22.1	28.2	21.2	26.2	33.4	41.4	74.8	14.5	20.8	24.5
L179	GH-23	12.8	112 †	24	29.5	21.1	26.1	30.8	41.7	79.2	18.4 †	25.6 †	28.1 †
L186	DE-23	15.6 †	93.7	22.1	26.1	18.8	24.7	28.6	40				
L189	GI-23	11.9	91	22.7	28.2	21.4	26.5	30.9	43.2	75.2	14.5	20.3	24
L192	DE-23	11.6	97.6	23.3	28	21.3	26.6	30.2	41.4	77.8	14.2	21.5	25.2