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2020

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File: ASPAC Plant Annual Report 2020 FINAL

Foreword

This ASPAC annual report is the 16th in the upgraded inter-laboratory proficiency program (ILPP) for plant chemical tests, the first of which occurred in 2004-2005.The report covers three rounds each of four specially prepared samples sent to around 41 participants in February, May and August 2020. 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 (GPL), 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

Department of Environment and Science (DES), Queensland, Australia, commissioned by GPL to confirm that test plant samples were homogenous prior to circulation for proficiency testing purposes, are acknowledged, as are operational staff of GPL.

Membership of ASPAC Laboratory Proficiency Committee 2020

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**G. Lancaster joined the LPC in 2020*

Service Provider Details 2020

Name, Street and Postal Address	*Key Personnel & Current Emails.*
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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.

Contents

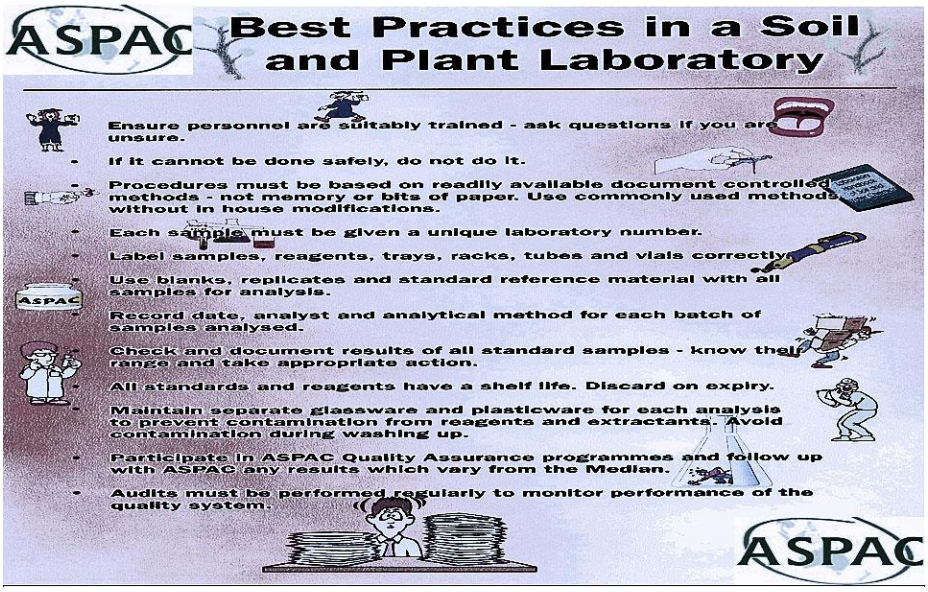
Notes on ASPAC Method-specific Certification: *what it is and what it is not*

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 element/test-specific, as each elemental test is assessed separately using internationally-respected non-parametric statistics. Obviously, the peer review process is strongest for 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 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, 21 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, the within-laboratory drying, grinding, mixing and sub-sampling of samples, 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 (1993)[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.



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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 2020 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 conducted in February, May and August 2020. For historical details on earlier 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, elemental-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 2020. 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 the 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

Forty-one laboratories [30 from Australia, 1 from Fiji, 1 from Guatemala, 6 from New Zealand, 1 from Pakistan, 1 from Papua New Guinea and 1 from the United Arab Emirates] participated in the ASPAC plant ILPP in 2020, but numbers of reported results varied by "round" and plant test (see Table 1) and were less than in previous years due probably to the Covid-19 pandemic. The counts for each test 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 2020. Participants were invited to analyse each sample using methods normally employed in their laboratory. Tests commonly performed are documented in Table 1. 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" (see section 2.6). For 18 of the 22 plant tests, the population average concentration for a given element was greater than corresponding medians (average values not presented), for 3 tests (C, P and S) median and average values were the same, while for the other test (N) the average was less than the median. Moreover, 13 grand median concentrations were lower than their 2019 counterparts, 5 were much the same, and 4 were higher.

Table 1. Plant tests, elemental symbols, units, the arithmetic average numbers of results per round submitted by participating laboratories in the ASPAC 2020 Plant ILPP, plus the concentration ranges and the final grand median concentration for all 22 tests.

2020 Plant tests	Symbol	Units	Average Number of participants			Concentration ranges (final) by test across 12 samples, as reported by labs		
			Feb 20	May 20	Aug 20	Minimum	Median	Maximum
Aluminium	Al	mg/kg	26	23	27	2.5	37.4	7620
Boron	B	mg/kg	31	29	31	0.9	14.4	48.8
Cadmium	Cd	µg/kg	18	17	19	1.8	19.3	1120
Calcium	Ca	%	34	34	34	0.01	0.4	1.5
Carbon	C	%	23	22	23	36.3	44.8	49.6
Chloride	Cl	mg/kg	18	17	16	204	1125	11900
Cobalt	Co	µg/kg	21	21	20	6.2	52.6	1330
Copper	Cu	mg/kg	34	33	35	3.5	6.6	34.1
Iron	Fe	mg/kg	34	32	35	23.8	50.5	497
Lead	Pb	µg/kg	17	15	17	5.2	65.5	232
Magnesium	Mg	%	34	34	34	0.1	0.2	0.8
Manganese	Mn	mg/kg	34	33	35	11.7	43.6	1780
Molybdenum	Mo	µg/kg	23	22	22	22.1	476	1120
Nitrate-N	NO_3-N	mg/kg	31	31	33	1.6	4.2	6220
Nitrogen	N	%	19	16	15	0.8	2.6	4.3
Phosphorus	P	%	35	34	35	0.1	0.3	0.7
Potassium	K	%	35	34	36	0.2	1.0	7.6
Selenium	Se	µg/kg	18	17	19	28.8	54.5	964
Silicon	Si	%	9	9	10	0.00	0.02	0.1
Sodium	Na	mg/kg	32	32	33	6.0	92.3	8610
Sulfur	S	%	32	29	29	0.1	0.2	0.4
Zinc	Zn	mg/kg	34	33	35	7.5	24.2	111

All but one of the tests in Table 1 were assumed to be total element 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.

The 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 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.

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 were considered to meet homogeneity criteria suited to proficiency testing. Examples of the homogeneity data and statistical assessments are summarized 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 requirements[6].

Ultimately, the samples used in the three rounds of the 2020 program were distributed and coded as follows: February 2020: ASP 2002-1 to 2002-4; May 2020: ASP 2005-1 to 2005-4 and August 2020: ASP 2008-1 to 2008-4. The first 2 digits refer to the year in which the "round" took place, the next 2 digits to the month of that year, and the final digit to 1 of the 4 samples per round. The association between sample code and sample type is provided in Table 2. Seven of the 12 plant test samples were sourced from Australia, four from New Zealand and one came from Vietnam.

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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 the origin of the samples included in the 2020 ASPAC plant ILPP.

Sample ID	*Round ID*	*Sample Type*	*Origin*	*Previous Rounds*
ASP 2002-1	**2**	Brown Rice	New Zealand	ASP1805-4
ASP 2002-2		Coffee Leaves	Vietnam	N/A
ASP 2002-3		Buffel Grass	Australia	ASP1808-4, ASP1702-2
ASP 2002-4		Faba Beans	Australia	N/A
ASP 2005-1	**5**	Wholegrain Oats	Australia	N/A
ASP 2005-2		Red Quinoa	Australia	ASP1802-4
ASP 2005-3		Celery	New Zealand	ASP1805-2
ASP 2005-4		Spinach Leaves	Australia	N/A
ASP 2008-1	**8**	Camellia Leaves	New Zealand	ASP1805-3
ASP 2008-2		Avocado Leaves	New Zealand	ASP1808-3
ASP 2008-3		Green Tea	Australia	ASP1802-3
ASP 2008-4		Barley	Australia	N/A

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. From the beginning of 2015, laboratories were able to submit results electronically, as .csv files, for direct transfer to the database. Checks were still made of data loaded in this way. 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, 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, it was expected that plant digests would be suitably diluted.

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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, newsletters from GPL were sent to all participating laboratories. Their main purpose was to assist in the interpretation of interim reports. Also included in GPL’s newsletters was information about upcoming events and operational administration of the program.

Laboratories that participated in the 2020 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 confidential 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 50th 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 equal zero. The arithmetic mean is sensitive to extreme measurements.
MAD	The Median of the Absolute Deviations, 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 25th percentile (referred to as the first quartile; Q_1) from the score at the 75th 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 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 2020.

Finally, if less than seven laboratories submitted results for a particular test and/or sample, proficiency assessments could not be made statistically with an acceptable level of confidence and hence certification for the specific tests could not be granted. This was not the case in 2020.

No certification was provided for the (total) plant Si test because the LPC determined that laboratories using digestion procedures could not possibly be getting all plant Si into solution because Si is mostly insoluble in digestion acids except hydrofluoric acid. Very few laboratories currently use methods that are able to determine true total Si (e.g. acid digests that include HF, X-Ray Fluorescence Spectroscopy, Neutron Activation Analysis and Alkaline Fusion techniques).

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 2020 Plant program remained valid until superseded by findings from the following Plant ILPP.

3. Summary Statistics

This section provides summary information and data (sometimes rounded only for table formatting purposes) on a test-by-test basis (in alphabetical order) for each of the 12 samples used across the three rounds in 2020. 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.

2020: Aluminium (mg Al/kg)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	27	28	28	28	27	27	27	27	29	28	29	29
Minimum i	0.1	133	78.3	65.9	52.2	18.5	13.3	293	61	3.72	191	136
Maximum i	24.2	379	311	277	87.4	64.6	147	547	187	8.21	730	549
Median i	1.79	314	243	96.8	70.1	44.8	46.9	417	115	5.62	523	333
Mean i	3.09	302	230	102	70.4	43.8	49.6	409	116	5.73	510	339
MAD i	0.69	31.5	28	15.4	5.7	6.5	9.5	30	12	0.825	82	56
IQR i	1.08	64.5	50.3	29.6	11.2	12.1	17.5	57	23	1.7	143	117
Robust CV% i	45	15	15	23	12	20	28	10	15	22	20	26
Median f	1.59	325	246	95.5	70.1	45.1	46.9	422	117	5.62	524	333
Mean f	1.51	324	247	95.5	70.4	45	47.2	413	118	5.73	533	338
MAD f	0.36	29.5	14	14.5	5.7	4.8	9.4	24.5	6	0.825	62	56
IQR f	0.77	59.3	30.5	27.9	11.2	9.7	16.9	53	12.5	1.7	134	112
Robust CV% f	36	14	9	22	12	16	27	9	8	22	19	25
Outliers	3	3	3	1	0	2	2	3	5	0	2	2
Stragglers	3	1	2	0	0	1	0	0	5	0	0	0

2020: Boron (mg B/kg)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	34	34	34	34	33	32	33	33	35	34	35	35
Minimum i	0.1	68.6	14.3	1.1	44.3	7.23	27.6	2.39	40.2	3.12	30.5	54.5
Maximum i	22.8	137	124	87.6	76.2	18.4	78.8	36.2	63.2	21	59.4	83.3
Median i	1.37	80.2	22.9	7.98	60.3	11.1	67.5	13.4	52.5	12	47	70.4
Mean i	2.83	81.6	27	11.7	59.9	11.6	65.9	14.1	51.6	12	46	70.6
MAD i	0.365	3.6	1.7	0.805	2.7	0.8	2.6	0.9	2	0.85	2.9	4.6
IQR i	1.41	7.43	3.2	1.55	5.3	1.58	4.6	2.2	4.9	1.38	6.35	7.85
Robust CV% i	76	7	10	14	7	11	5	12	7	9	10	8
Median f	1.11	80.2	22.9	8.06	60.4	10.9	67.8	13.1	53	11.9	47.1	71.8
Mean f	1.19	79.9	23	7.97	60.3	10.9	67.9	13.3	52.8	11.7	46.9	72.1
MAD f	0.23	3.5	1.3	0.75	2.55	0.6	2.2	0.6	1.05	0.5	2.5	3.6
IQR f	0.43	6.5	2.35	1.24	5.1	1.18	3.5	0.9	1.93	1.2	5	6.8
Robust CV% f	29	6	8	11	6	8	4	5	3	8	8	7
Outliers	9	1	3	6	3	5	5	5	6	5	4	2
Stragglers	2	0	1	1	0	1	1	5	5	1	0	1

2020: Cadmium (µg Cd/kg)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	18	18	19	19	16	16	16	16	20	18	20	19
Minimum i	2.93	0.0338	82	103	7	15	1.2	124	254	0.986	234	3.56
Maximum i	84	70	262	317	20.9	28.5	26.8	172	459	90.9	302	116
Median i	4.5	1.95	235	249	8.57	16.7	2.11	144	410	3.7	277	7.07
Mean i	11.8	10.4	225	244	10.2	18.4	5.59	144	392	12.8	267	21.9
MAD i	0.82	0.53	9	12	1.01	0.8	0.41	6	14.5	0.5	11.5	1.26
IQR i	2.07	4.08	27.5	30	2.2	1.85	1.92	15.5	33.8	2.57	30	14.5
Robust CV% i	34	155	9	9	19	8	67	8	6	51	8	152
Median f	4.5	1.95	235	249	8.57	16.7	2.11	144	410	3.7	277	7.07
Mean f	4.55	1.51	236	251	9.2	16.7	2.08	142	406	3.69	269	6.55
MAD f	0.82	0.53	9	12	1.01	0.8	0.41	6	14.5	0.5	11.5	1.26
IQR f	1.62	0.59	21	22.8	1.86	1.3	0.388	14	33	0.795	27.5	2.51
Robust CV% f	27	22	7	7	16	6	14	7	6	16	7	26
Outliers	4	8	2	3	2	3	6	1	3	7	1	6
Stragglers	0	0	0	0	0	0	0	0	0	0	0	0

2020: Calcium (%Ca)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	39	39	39	39	36	36	36	36	41	41	41	41
Minimum i	0.02	0.636	0.415	0.0548	0.794	0.173	1.3	0.335	1.95	0.13	0.917	0.33
Maximum i	0.148	3.39	2.75	2.79	2.53	0.382	2.81	0.701	2.86	0.223	1.64	0.622
Median i	0.046	3	1.01	0.084	2.27	0.317	2.46	0.63	2.25	0.147	1.05	0.406
Mean i	0.0491	2.85	1.02	0.154	2.2	0.312	2.43	0.621	2.26	0.151	1.07	0.408
MAD i	0.0025	0.15	0.048	0.008	0.09	0.008	0.09	0.0255	0.09	0.007	0.04	0.016
IQR i	0.0057	0.27	0.079	0.0146	0.175	0.0163	0.163	0.0445	0.17	0.014	0.07	0.031
Robust CV% i	9	7	6	13	6	4	5	5	6	7	5	6
Median f	0.0455	3.01	1.01	0.0836	2.27	0.317	2.45	0.637	2.24	0.146	1.05	0.402
Mean f	0.0458	2.99	1.01	0.0849	2.27	0.316	2.45	0.638	2.24	0.147	1.04	0.401
MAD f	0.0015	0.14	0.03	0.0064	0.08	0.007	0.07	0.02	0.08	0.0045	0.03	0.01
IQR f	0.00285	0.28	0.056	0.0108	0.155	0.0118	0.125	0.041	0.15	0.00925	0.065	0.02
Robust CV% f	5	7	4	10	5	3	4	5	5	5	5	4
Outliers	7	3	7	3	3	7	5	3	3	4	5	6
Stragglers	2	0	1	2	1	1	0	0	1	1	1	2

2020: Carbon (%C)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	26	26	26	26	26	26	26	26	26	26	26	26
Minimum i	42.8	41.6	40.8	43.1	2.76	1.64	2.13	1.65	36.9	41.4	41.8	47.8
Maximum i	47.8	46	46.6	47.7	43.2	43.8	44.8	44.4	41.1	47	45.8	52.3
Median i	46.6	44.4	45.6	46.3	42.3	43	44.1	43.6	40.2	45.5	45.1	51.6
Mean i	46.6	44.3	45.1	46.2	40.4	40.8	42.1	41.5	39.8	45	44.6	51.1
MAD i	0.35	0.4	0.35	0.3	0.55	0.35	0.3	0.35	0.3	0.45	0.45	0.35
IQR i	0.75	0.875	0.65	0.575	1.35	1.35	1.08	1.2	0.875	1.03	1.18	0.9
Robust CV% 1	1	1	1	1	2	2	2	2	2	2	2	1
Median f	46.7	44.4	45.7	46.3	42.5	43.1	44.2	43.7	40.2	45.7	45.3	51.7
Mean f	46.8	44.4	45.7	46.3	42.4	43.1	44.2	43.7	40.2	45.5	45.1	51.7
MAD f	0.35	0.4	0.4	0.3	0.3	0.2	0.2	0.15	0.2	0.3	0.25	0.25
IQR f	0.65	0.75	0.6	0.5	0.55	0.375	0.4	0.3	0.25	0.725	0.8	0.525
Robust CV% f	1	1	1	1	1	1	1	1	0	1	1	1
Outliers	2	3	5	4	4	7	6	6	5	5	5	4
Stragglers	0	0	0	1	2	1	1	4	3	2	1	2

2020: Chloride (mg Cl/kg)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	20	20	20	20	20	20	20	20	21	21	21	21
Minimum i	0.115	0.47	0.37	0.82	0.29	0.49	0.27	0.37	3650	533	4550	60
Maximum i	1860	3460	2980	8190	4840	19300	4260	9000	10100	5070	14100	1200
Median i	536	1120	1540	6200	3770	17400	1760	8100	7020	1570	9160	383
Mean i	675	1540	1800	5860	3510	15900	2030	7500	6950	1720	8850	495
MAD i	78	301	180	325	325	700	400	385	390	130	420	117
IQR i	167	1130	865	685	545	2580	695	808	710	220	550	288
Robust CV% i	23	75	42	8	11	11	29	7	7	10	4	56
Median f	509	1080	1500	6260	3800	17600	1640	8250	7010	1540	9200	334
Mean f	499	1120	1480	6240	3690	17500	1690	8240	7010	1530	9260	354
MAD f	48	70	20	190	230	300	340	255	120	100	210	77.5
IQR f	89.3	173	40	368	460	600	565	478	195	170	285	149
Robust CV% f	13	12	2	4	9	3	26	4	2	8	2	33
Outliers	5	6	8	5	2	5	4	4	5	4	4	3
Stragglers	1	2	3	1	1	2	1	0	4	0	2	2

2020: Cobalt (µg Co/kg)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	19	20	20	20	21	21	21	21	23	22	23	21
Minimum i	16.8	28	63.9	65.9	5	416	0.915	166	1030	36.3	222	61
Maximum i	955	3350	3360	1620	4940	5070	4790	6160	1830	218	523	137
Median i	21.1	78.8	118	213	30.9	621	48.1	403	1540	153	385	74.6
Mean i	72.9	249	290	325	268	853	274	701	1470	151	370	79.8
MAD i	1.1	9.1	7.5	25	2.4	18.5	7.4	18	40	4	6	2.5
IQR i	6.7	21.5	26.3	49.3	10.2	44	14.9	66	150	12.5	41	8
Robust CV% i	24	20	17	17	24	5	23	12	7	6	8	8
Median f	21.1	78.8	118	213	30.9	621	48.1	403	1540	153	385	74.6
Mean f	21.2	77.3	116	212	30.7	617	47.5	406	1540	152	387	74.2
MAD f	1.1	9.1	7.5	25	2.4	18.5	7.4	18	40	4	6	2.5
IQR f	1.75	15.8	10.5	36	3.98	27.8	10.8	36	100	6.25	12.3	6.4
Robust CV% f	6	15	7	13	10	3	17	7	5	3	2	6
Outliers	7	5	6	5	7	5	5	4	6	8	7	4
Stragglers	0	0	0	0	0	0	0	0	0	0	0	0

2020: Copper (mg Cu/kg)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	39	39	39	39	35	35	35	35	39	39	39	39
Minimum i	1.1	89.1	0.582	28.1	5.16	2.63	7.12	9.76	106	2	8.45	2.82
Maximum i	49.8	150	92.6	94.8	13.4	10.5	13.9	16.9	167	10.8	16.2	8.49
Median i	5.12	130	2.75	33.1	7.23	4.82	8.86	11.5	133	4.25	11.3	5.94
Mean i	6.36	127	5.31	35	7.48	5	9.09	11.9	132	4.51	11.4	5.83
MAD i	0.46	6	0.35	1.7	0.49	0.32	0.62	0.6	6	0.32	0.6	0.35
IQR i	0.905	15	0.665	3.3	0.975	0.575	1.2	1.25	11	0.6	1.1	0.675
Robust CV% i	13	9	18	7	10	9	10	8	6	10	7	8
Median f	5.1	131	2.65	32.7	7.23	4.82	8.75	11.3	134	4.25	11.3	5.97
Mean f	5.12	129	2.69	32.8	7.18	4.86	8.81	11.3	135	4.3	11.3	5.94
MAD f	0.4	5	0.33	1.6	0.4	0.2	0.56	0.5	5	0.23	0.5	0.25
IQR f	0.655	12	0.6	2.95	0.845	0.44	1.13	0.95	9	0.42	0.975	0.535
Robust CV% f	10	7	17	7	9	7	10	6	5	7	6	7
Outliers	8	3	4	4	4	6	3	5	5	7	5	7
Stragglers	0	3	2	0	0	2	0	0	1	1	0	1

2020: Iron (mg Fe/kg)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	38	38	37	38	35	35	35	35	39	39	39	39
Minimum i	28.8	154	172	40.3	78.2	54.9	51.2	248	162	21.5	299	152
Maximum i	82	274	2490	326	358	79.6	89.5	402	339	68.9	557	301
Median i	34.9	206	285	212	98	69.2	71.3	340	255	46.9	417	207
Mean i	39.2	202	388	210	105	68.4	71.3	336	255	47.2	418	207
MAD i	2.25	10.5	36	26.5	3.3	4	2.7	16	16	1.9	23	14
IQR i	8.35	29	94	53.3	6.9	7.7	5.15	32	35.5	3.75	44.5	26.5
Robust CV% i	18	10	24	19	5	8	5	7	10	6	8	9
Median f	33.7	208	273	208	97.5	69.4	71.6	343	256	46.9	423	207
Mean f	33.7	205	281	206	97.2	70	71.7	343	259	47	425	205
MAD f	1	7.5	25	22.5	2.35	3.3	2.35	12.5	14	1.6	16.5	13
IQR f	1.78	17.3	45	49.5	4.03	6.2	4.6	23.3	25	2.8	29.3	22
Robust CV% f	4	6	12	18	3	7	5	5	7	4	5	8
Outliers	9	8	4	4	8	3	5	6	5	7	6	3
Stragglers	5	2	4	0	3	1	0	1	1	1	3	1

2020: Lead (µg Pb/kg)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	16	16	16	16	15	15	15	15	19	17	19	19
Minimum i	1	91	129	107	230	24.8	77	135	42.6	0.1	218	109
Maximum i	130	336	364	382	540	882	399	362	2640	2550	3080	2410
Median i	4.62	113	163	140	277	35.6	89.3	147	58.2	5.15	397	150
Mean i	28.7	142	197	176	303	110	135	179	220	181	533	285
MAD i	3.29	3	5	18.5	15	2.1	7.25	9	4.2	3.65	11	10
IQR i	22	15.8	39	59	37.5	17.1	47.9	24.5	18.1	16	47.5	25
Robust CV% i	354	10	18	31	10	36	40	12	23	230	9	12
Median f	4.62	113	163	140	277	35.6	89.3	147	58.2	5.15	397	150
Mean f	6.66	111	163	144	268	35.3	91.6	150	59.5	6.02	395	156
MAD f	3.29	3	5	18.5	15	2.1	7.25	9	4.2	3.65	11	10
IQR f	7.99	4.5	9	38	37	3.1	15.5	18.3	7.6	7.86	25	25
Robust CV% f	128	3	4	20	10	6	13	9	10	113	5	12
Outliers	4	6	5	3	2	6	4	3	6	5	5	3
Stragglers	0	0	0	0	0	0	0	0	0	0	0	0

2020: Magnesium (%Mg)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	39	39	39	39	36	36	36	36	41	41	41	41
Minimum i	0.07	0.226	0.2	0.227	0.258	0.174	0.37	0.171	0.1	0.108	0.23	0.16
Maximum i	0.143	0.31	0.337	0.346	94.7	0.265	0.615	0.285	1.38	12	0.376	0.269
Median i	0.115	0.274	0.302	0.293	0.372	0.228	0.506	0.234	1.19	0.131	0.291	0.192
Mean i	0.114	0.274	0.298	0.291	3.1	0.224	0.504	0.233	1.17	0.421	0.293	0.192
MAD i	0.005	0.011	0.012	0.009	0.014	0.008	0.0245	0.008	0.07	0.007	0.013	0.007
IQR i	0.011	0.0205	0.023	0.02	0.0255	0.0153	0.0478	0.0153	0.14	0.012	0.026	0.017
Robust CV% i	7	6	6	5	5	5	7	5	9	7	7	7
Median f	0.115	0.274	0.304	0.295	0.371	0.228	0.506	0.234	1.19	0.13	0.291	0.192
Mean f	0.115	0.274	0.305	0.294	0.372	0.227	0.509	0.233	1.21	0.131	0.292	0.19
MAD f	0.005	0.01	0.012	0.005	0.013	0.0075	0.022	0.0065	0.06	0.007	0.0115	0.006
IQR f	0.0095	0.02	0.0235	0.01	0.0235	0.0128	0.045	0.0133	0.13	0.012	0.024	0.0155
Robust CV% f	6	5	6	3	5	4	7	4	8	7	6	6
Outliers	4	1	4	5	5	4	3	6	1	4	2	6
Stragglers	0	1	0	5	0	0	0	2	1	0	1	0

2020: Manganese (mg Mn/kg)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	38	38	38	38	35	35	35	35	40	40	40	40
Minimum i	27.5	15.2	29.5	29.7	34.5	44.7	10.2	33.4	40	17.8	28	252
Maximum i	52.9	36.7	60.5	70.1	48.3	63.2	24.1	43.8	167	25	49.4	440
Median i	44.3	28.3	47.1	55.5	44.4	57	13.5	38.8	140	20.8	43.5	293
Mean i	43.6	27.7	46.1	54.2	43.7	55	13.4	38.2	138	20.8	43.3	295
MAD i	1.35	1.1	1.8	2.25	1.6	2.2	0.8	1.5	7	0.85	2.15	9
IQR i	2.6	2.1	3.7	4.48	3.05	5.45	1.55	3.35	13.8	1.45	3.98	17.5
Robust CV% i	4	6	6	6	5	7	9	6	7	5	7	4
Median f	44.4	28.5	47.5	55.6	44.8	57.4	13.6	39.1	140	20.8	43.6	294
Mean f	44.5	28.5	47.4	55.6	44.5	57.1	13.5	38.6	141	20.7	43.7	294
MAD f	1	0.95	0.95	2	1.2	0.8	0.65	1.15	6	0.8	2.2	6
IQR f	2	1.8	1.93	4	2.35	1.7	1.33	2.25	11	1.3	3.75	12.5
Robust CV% f	3	5	3	5	4	2	7	4	6	5	6	3
Outliers	7	6	10	5	3	5	5	3	3	3	1	6
Stragglers	2	2	4	0	1	6	0	2	0	0	0	3

2020: Molybdenum (µg Mo/kg)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	24	23	22	23	23	23	23	23	23	23	23	23
Minimum i	220	54.6	10	64.5	93.8	79.9	61.4	197	5020	840	179	960
Maximum i	1120	288	210	402	253	437	267	1600	10500	1480	1820	1970
Median i	254	185	60.4	288	182	304	226	1330	6010	890	309	1040
Mean i	319	177	68.9	281	185	282	207	1220	6360	959	397	1100
MAD i	8	8.5	11.5	6.5	5	10	7	50	170	35	8	20
IQR i	25.8	39.5	28	32	27	38	27.5	155	965	120	38.5	75
Robust CV% i	8	16	34	8	11	9	9	9	12	10	9	5
Median f	254	185	60.4	288	182	304	226	1330	6010	890	309	1040
Mean f	256	184	61.4	288	184	306	228	1330	5910	890	309	1030
MAD f	8	8.5	11.5	6.5	5	10	7	50	170	35	8	20
IQR f	19.8	13	16.8	8	8.5	13.5	16.8	70	360	55.8	10	57.5
Robust CV% f	6	5	21	2	3	3	5	4	4	5	2	4
Outliers	6	10	3	10	9	9	7	6	8	5	10	5
Stragglers	0	0	0	0	0	0	0	0	0	0	0	0

2020: Nitrate-nitrogen (mg NO_3-N/kg)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	17	17	17	17	16	15	15	15	19	18	18	18
Minimum i	0.001	0.001	0.001	0.001	11.8	0.545	30	25	2510	0.5	5.1	0.5
Maximum i	104	93.3	58.7	74.5	62.5	60	95.9	82.5	3720	78.7	74.7	33.9
Median i	6.37	11.1	7.39	6.7	20.5	5.87	65.2	49	3390	3.84	10	3.86
Mean i	18.9	19.3	13	16.1	25.7	11.3	66.3	52.4	3320	12	15.3	7.46
MAD i	3.37	4.52	4.39	3.26	4.45	1.87	9	9.4	110	1.98	2.65	2.32
IQR i	6.3	7.6	7.78	5.59	9.2	4.56	17	15	245	3.92	4.48	4.73
Robust CV% i	73	51	78	62	33	58	19	23	5	76	33	91
Median f	5.01	10.4	6.12	4.83	19.9	5.12	67.7	49	3390	2.38	8.97	2.96
Mean f	4.58	10.1	6.57	5.07	20.5	4.96	68.9	52.4	3370	3.06	8.56	3.32
MAD f	2.01	3.46	4.03	1.87	3.65	1.56	8.1	9.4	105	1.41	2.2	1.2
IQR f	4.62	5.69	7.32	4.21	6.98	2.86	15.4	15	205	2.53	4.35	2.3
Robust CV% f	68	41	89	65	26	41	17	23	4	79	36	58
Outliers	4	3	3	4	2	3	1	0	1	3	4	3
Stragglers	0	0	0	0	0	0	0	0	0	1	0	1

2020: Nitrogen (%N)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	39	39	39	39	35	35	35	35	36	36	36	36
Minimum i	1.87	0.257	0.75	3.04	2.45	1.44	1.92	1.45	3.28	3.35	2.45	1.64
Maximum i	2.22	2.45	1.31	3.65	42.9	43.3	44.4	43.8	3.85	3.88	3.01	2.13
Median i	2.1	2.33	0.994	3.47	2.71	1.63	2.1	1.63	3.74	3.71	2.8	1.99
Mean i	2.1	2.26	1	3.45	3.84	2.81	3.31	2.83	3.69	3.69	2.77	1.99
MAD i	0.04	0.05	0.052	0.06	0.05	0.05	0.04	0.06	0.08	0.075	0.055	0.05
IQR i	0.07	0.1	0.112	0.125	0.11	0.11	0.085	0.105	0.155	0.145	0.105	0.085
Robust CV% i	2	3	8	3	3	5	3	5	3	3	3	3
Median f	2.11	2.34	0.993	3.48	2.71	1.61	2.1	1.63	3.75	3.71	2.8	1.99
Mean f	2.11	2.34	0.995	3.48	2.71	1.61	2.1	1.63	3.74	3.71	2.79	1.99
MAD f	0.02	0.03	0.0445	0.06	0.05	0.05	0.04	0.04	0.065	0.07	0.05	0.03
IQR f	0.05	0.06	0.0883	0.113	0.09	0.0875	0.08	0.08	0.13	0.123	0.095	0.05
Robust CV% f	2	2	7	2	2	4	3	4	3	2	3	2
Outliers	2	3	3	3	4	3	7	1	4	3	5	2
Stragglers	4	3	0	0	0	2	0	3	1	0	0	7

2020: Phosphorus (%P)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	39	39	38	39	36	36	36	36	40	40	40	40
Minimum i	0.286	0.1	0.05	0.134	0.128	0.146	0.234	0.293	0.213	0.221	0.104	0.112
Maximum i	0.87	0.52	0.16	2.18	0.232	0.247	0.42	0.504	0.399	0.406	0.204	0.204
Median i	0.384	0.161	0.059	0.548	0.177	0.188	0.307	0.386	0.31	0.332	0.13	0.134
Mean i	0.405	0.173	0.0655	0.6	0.175	0.186	0.304	0.385	0.312	0.332	0.133	0.135
MAD i	0.017	0.008	0.003	0.017	0.006	0.007	0.0125	0.012	0.011	0.0105	0.006	0.0055
IQR i	0.03	0.0165	0.00658	0.0385	0.0123	0.0158	0.0248	0.023	0.0215	0.0173	0.0115	0.0105
Robust CV% i	6	8	8	5	5	6	6	4	5	4	7	6
Median f	0.383	0.159	0.0573	0.546	0.178	0.188	0.308	0.386	0.307	0.331	0.13	0.133
Mean f	0.381	0.16	0.0569	0.545	0.177	0.187	0.307	0.385	0.306	0.331	0.129	0.133
MAD f	0.0115	0.007	0.00315	0.014	0.0055	0.007	0.011	0.009	0.0075	0.0025	0.005	0.004
IQR f	0.0208	0.015	0.00645	0.0275	0.0103	0.0125	0.021	0.0165	0.0145	0.0045	0.00975	0.0075
Robust CV% f	4	7	8	4	4	5	5	3	4	1	6	4
Outliers	8	6	6	8	4	4	5	8	6	7	3	3
Stragglers	1	0	0	0	0	0	0	1	2	9	3	3

2020: Potassium (%K)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	38	39	39	39	36	36	36	36	40	40	40	40
Minimum i	0.284	1.42	0.35	1.65	0.174	0.13	0.158	0.188	4.22	0.79	0.243	0.265
Maximum i	0.457	2.07	1.63	2.35	1.96	1.79	2.01	2.24	6.07	1.21	0.565	0.85
Median i	0.37	1.74	0.529	1.94	1.47	1.51	1.61	1.83	4.85	0.93	0.41	0.62
Mean i	0.369	1.73	0.553	1.95	1.44	1.46	1.58	1.8	4.84	0.928	0.41	0.618
MAD i	0.0155	0.07	0.027	0.07	0.085	0.08	0.085	0.09	0.22	0.0565	0.026	0.034
IQR i	0.0315	0.14	0.0515	0.125	0.163	0.143	0.168	0.193	0.558	0.113	0.0543	0.0673
Robust CV% i	6	6	7	5	8	7	8	8	9	9	10	8
Median f	0.364	1.75	0.529	1.94	1.47	1.51	1.61	1.83	4.83	0.928	0.405	0.617
Mean f	0.362	1.73	0.528	1.94	1.47	1.52	1.61	1.84	4.79	0.921	0.404	0.612
MAD f	0.014	0.055	0.02	0.045	0.07	0.075	0.08	0.08	0.225	0.057	0.023	0.031
IQR f	0.029	0.115	0.04	0.0925	0.145	0.133	0.153	0.18	0.51	0.118	0.0458	0.066
Robust CV% f	6	5	6	4	7	7	7	7	8	9	8	8
Outliers	5	6	4	6	3	4	2	2	2	1	5	4
Stragglers	0	1	1	5	2	0	0	1	0	0	1	1

2020: Selenium (µg Se/kg)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	19	18	18	18	18	18	18	18	20	20	19	18
Minimum i	40	21.8	23.6	103	5.66	25	48.4	70	417	208	32	2
Maximum i	4550	698	758	828	1000	458	910	378	1420	752	551	169
Median i	58.7	82	33.3	124	484	45	95.1	78	651	291	45	11.3
Mean i	362	158	136	233	507	69.7	158	112	705	341	96.4	36
MAD i	3.5	12.7	4.75	9	61	5.9	11.8	5	24	13	4.2	3.14
IQR i	35.7	38.5	21.9	25.8	105	12.7	30.3	21	80.5	61.5	60.6	26.5
Robust CV% i	45	35	49	15	16	21	24	20	9	16	100	174
Median f	58.7	82	33.3	124	484	45	95.1	78	651	291	45	11.3
Mean f	57.7	84.7	33.6	124	482	44.5	96.7	77.5	662	288	43	12
MAD f	3.5	12.7	4.75	9	61	5.9	11.8	5	24	13	4.2	3.14
IQR f	5.4	20.1	8.1	16	90.5	12.1	16.7	7.1	40	21	5.58	3.98
Robust CV% f	7	18	18	10	14	20	13	7	5	5	9	26
Outliers	8	5	5	4	3	2	4	5	7	7	7	6
Stragglers	0	0	0	0	0	0	0	0	0	0	0	0

2020: Silicon (%Si) NOT CERTIFIED

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	8	8	8	8	9	9	9	9	10	9	10	10
Minimum i	0.0098	0.04	0.0314	0.015	0.028	0.007	0.0404	0.011	0.0088	0.00052	0.0101	0.0116
Maximum i	0.0432	0.149	0.284	0.065	2.57	1.15	0.0913	1.26	36.4	9.94	45.3	40.4
Median i	0.015	0.0664	0.0541	0.0207	0.131	0.0973	0.052	0.122	0.0451	0.005	0.0727	0.054
Mean i	0.0199	0.0717	0.0789	0.0282	0.396	0.204	0.0578	0.233	3.68	1.11	4.62	4.1
MAD i	0.002	0.0137	0.0079	0.0027	0.059	0.0309	0.0076	0.0447	0.00875	0.00352	0.0247	0.0217
IQR i	0.00663	0.0218	0.017	0.00903	0.106	0.0616	0.0136	0.0827	0.016	0.013	0.0399	0.0407
Robust CV% i	33	24	23	32	60	47	19	50	26	193	41	56
Median f	0.015	0.0618	0.0522	0.0197	0.12	0.084	0.0485	0.109	0.0422	0.0025	0.0693	0.0525
Mean f	0.0145	0.0606	0.0496	0.0189	0.125	0.0859	0.049	0.105	0.0441	0.0031	0.0576	0.0474
MAD f	0.0005	0.0107	0.0088	0.0013	0.052	0.0225	0.0066	0.0339	0.0058	0.0015	0.0134	0.0102
IQR f	0.0005	0.02	0.0157	0.00335	0.0987	0.048	0.0099	0.0598	0.0088	0.00289	0.0374	0.0215
Robust CV% f	2	24	22	13	61	42	15	41	15	86	40	30
Outliers	2	1	1	2	1	1	2	1	2	2	2	2
Stragglers	1	0	0	0	0	0	0	0	1	1	0	0

2020: Sodium (mg Na/kg)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	33	34	35	35	33	34	34	34	37	37	37	37
Minimum i	0.002	0.01	0.05	0.07	0.007	0.677	0.033	0.207	22	80	10000	184
Maximum i	65.6	189	659	941	6600	7800	444	3420	300	208	16000	315
Median i	25.7	97.1	600	829	68.2	6720	286	2120	70	103	13500	217
Mean i	26.9	97	542	727	276	6260	286	2030	84.6	110	13300	222
MAD i	5.7	12.9	31	33	11.7	365	22.5	150	10.4	6	700	15
IQR i	10.5	22.7	52	68	27.7	718	46	275	21.6	11	1500	29
Robust CV% i	30	17	6	6	30	8	12	10	23	8	8	10
Median f	25.9	97.1	604	830	60	6750	283	2120	68.7	102	13700	215
Mean f	26.6	99.7	601	830	63.4	6700	284	2100	67.2	102	13600	213
MAD f	4	10.6	27	17.5	4.5	290	19.5	100	6.2	3.9	650	12
IQR f	8.18	20.6	45.5	34.3	13.6	630	38.5	235	12.1	6.2	1230	21
Robust CV% f	23	16	6	3	17	7	10	8	13	5	7	7
Outliers	7	5	5	8	7	3	4	3	6	7	4	3
Stragglers	2	1	0	3	3	1	0	1	4	2	1	1

2020: Sulfur (%S)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	35	35	35	35	33	33	33	33	35	35	35	35
Minimum i	0.126	0.138	0.06	0.142	0.112	0.112	0.116	0.111	0.176	0.04	0.125	0.131
Maximum i	0.46	0.63	0.28	0.9	0.232	0.31	1.7	0.42	0.806	0.381	0.61	0.67
Median i	0.18	0.214	0.0863	0.264	0.168	0.183	0.188	0.169	0.518	0.182	0.205	0.246
Mean i	0.191	0.227	0.0979	0.284	0.172	0.189	0.24	0.18	0.52	0.184	0.223	0.265
MAD i	0.01	0.01	0.0053	0.014	0.005	0.008	0.01	0.011	0.024	0.011	0.007	0.008
IQR i	0.02	0.019	0.0095	0.022	0.012	0.017	0.02	0.022	0.034	0.018	0.0135	0.0165
Robust CV% i	8	7	8	6	5	7	8	10	5	7	5	5
Median f	0.179	0.214	0.0847	0.262	0.168	0.182	0.187	0.168	0.514	0.182	0.204	0.245
Mean f	0.18	0.213	0.0845	0.261	0.169	0.18	0.187	0.169	0.511	0.181	0.205	0.245
MAD f	0.0085	0.0065	0.003	0.01	0.004	0.0055	0.0055	0.007	0.01	0.005	0.007	0.005
IQR f	0.0178	0.0108	0.00598	0.02	0.008	0.0103	0.00975	0.0135	0.0245	0.01	0.012	0.011
Robust CV% f	7	4	5	6	4	4	4	6	4	4	4	3
Outliers	3	7	8	6	9	8	6	5	6	3	4	6
Stragglers	2	2	1	0	1	3	3	1	5	5	0	4

2020: Zinc (mg Zn/kg)

Statistical parameters	Plant sample identification and values											
	February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
	ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
No of results	38	37	38	38	35	35	35	35	40	40	40	40
Minimum i	15.5	13.5	5.7	20.2	8.77	8.42	7.48	17.1	13.6	4.2	23.1	37.2
Maximum i	35.2	30.2	20.6	62.9	21.6	18.7	19	28.8	53.4	71	94.9	173
Median i	21.5	22.8	8.73	46.5	15.3	15.3	13.1	23.7	37.7	24	26.6	43.6
Mean i	21.8	22.6	9.67	46.7	15.3	15.1	13.1	23.8	37.4	24.8	28.3	46.3
MAD i	1.65	1.6	0.9	2.65	0.8	0.9	0.8	0.8	1.45	1.1	1.1	1.3
IQR i	3.18	2.8	1.76	4.73	1.45	1.95	1.3	1.6	2.65	2.25	2.23	2.65
Robust CV% i	11	9	15	8	7	9	7	5	5	7	6	5
Median f	21.5	22.5	8.48	46.4	15.3	15.3	13.2	23.7	37.7	24	26.5	43.9
Mean f	21.6	22.3	8.65	46.4	15.3	15.2	13.1	23.8	37.6	23.9	26.4	44
MAD f	1.55	1.4	0.72	1.9	0.5	0.4	0.35	0.4	0.7	0.85	0.9	0.9
IQR f	3.13	1.9	1.47	3.65	1.05	0.7	0.65	0.7	1.38	1.38	1.95	1.7
Robust CV% f	11	6	13	6	5	3	4	2	3	4	5	3
Outliers	2	3	5	6	5	4	6	6	5	4	3	8
Stragglers	0	1	2	1	3	2	5	8	7	2	2	4

4. Comments on Measurement Performance

Full evaluation of measurement performance is beyond the scope of this report. These are typically made at ASPAC Workshops and in other national and international fora. However, a few observations are made here.

The grand median robust % CVs across the 12 samples by test in 2020, after the removal of "outliers" and "stragglers", ranged from 1.0 (for C, also the lowest in 2019) to 45.5 (for NO_3-N, also the highest in 2019). Figure 4.1 presents grand median robust %CVs for program years 2020 and 2019.

Robust %CV can be influenced by analyte concentrations. However, for the 2020 Plant Program Year, only the robust %CVs for B, Co, Cu and Mn were influenced by analyte concentrations to any extent (highest %CVs at lowest concentrations), with coefficients of determination (r^2) for separate power functions of 0.37, 0.42, 0.30 and 0.32 respectively.

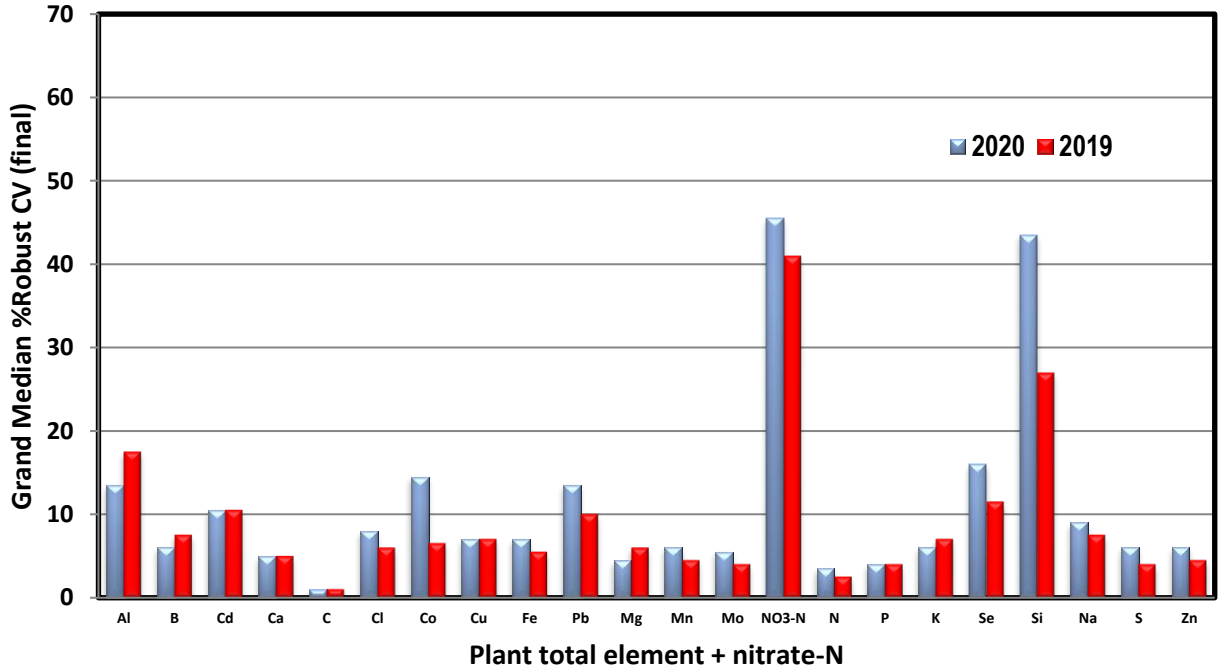

Figure 4.1. Grand median robust %CVs (final) for plant program years 2020 and 2019, including plant Si which was not certified in either year.

The sequence for plant test samples with best (sample ASP 2008-1 at 5.0%) to worst (sample ASP 2005-1 at 9.5%) grand median %CVs across all 22 tests was (ASP): [2008-1]<[2002-2,2002-3,2002-4,2008-2]<2008-3<[2005-3,2005-4]<[2005-2]<[2003-4]<[2002-1]<[2005-1]. Collectively, the program grand median %CV for the 12 test samples was 6.8% (6.5% in 2019).

Median concentrations of the elements essential for plant growth (Table1) were generally within the bounds expected of healthy plants, with the exception of nitrate-N (grand median of 4.2 mg/kg) which was below typical plant concentrations. and well below concentrations found in leaf petioles which are often a target sample for nitrate-N. However, 2 samples (2005-3 and 2005-4) had median concentrations of more than 1000 mg/kg.

Across all 7008 reported plant test results in 2020, 14.4% were statistically assessed to be "outliers" and 3.2% were assessed to be "stragglers", which was proportionately less outliers than in 2019 (18.5%), but virtually the same percentage of stragglers (4.3% in 2019). For individual elements, the range of "outliers", expressed as percentages of

the number of reported results for the particular test, ranged from 8.3% (for Cu) to 26.0% (Pb), while those for "stragglers" ranged from zero% (Cd, Co, Pb, Mo, Se) to 8.1% (C).

Appendix 1: List of laboratories (including contact details at the time) who participated in ASPAC's Plant ILPP in 2020, arranged by country

Name (position)	*Facility*	*Street and/or Postal Address*	*Country*	*Email*
Kraig Sutherland (Laboratory Manager)	AgVita Analytical	4 Thompson's Road, Latrobe, TAS 7307 PO Box 188, Devonport, TAS 7310	Australia	ksutherland@agvita.com.au
Weiming Dai	Analytical Laboratories and Technical Services Australia (ALTSA)	585 River Avenue, Merbein South, Victoria 3505	Australia	weiming.dai@altsa.com.au
Tim Thompson (Operations Manager)	APAL Laboratory Pty Ltd	U 3, 11 Ridley Street, Hindmarsh, SA 5007 PO Box 327, Magill, SA 5072	Australia	tim@apal.com.au
Peter Keating (Managing Director)	Bioscience	488 Nicholson Rd, Forrestdale, WA 6112 PO Box 5466, Canning Vale South, WA 6155	Australia	bioscience@biosciencewa.com
Chris Gendle (Chemist)	CSBP Ltd – Soil and Plant	2 Altona St, Bibra Lake, WA 6163	Australia	chris.gendle@csbp.com.au
Nell Peisley (DNA Sequencing Coordinator)	CSIRO Analytical Chemistry Group - Agriculture	Clunies Ross St, Acton, ACT 2601 GPO Box 1600, Canberra, ACT 2601	Australia	nell.peisley@csiro.au
Claire Wright (ICP Technical Officer)	CSIRO Land and Water, Adelaide	Entrance 4 Waite Rd, Urrbrae, SA 5064 Private Bag 2, Glen Osmond, SA 5064	Australia	Claire.Wright@csiro.au
Yvette Cheyne (Manager)	Dept of Environment and Science – Chemistry Centre	Block A - Level 3, 41 Boggo Road, Joe Baker Street, Loading Dock 3, Dutton Park, QLD 4102 Business Unit (ESP), GPO Box 2454, Brisbane, QLD 4001	Australia	Yvette.cheyne@des.qld.gov.au
Clarence Mercer (Technical Officer)	DPI Tamworth Soil Chemistry	4 Marsden Park Road, Calala, NSW, 2340	Australia	clarence.mercer@dpi.nsw.gov.au
Subashini Munasinghe (Strategic Project and Technical Manager)	Dual Chelate Fertilizer Pty Ltd	162 New Guinea Road, Robinvale, Victoria, 3549	Australia	suba@dualchelate.com
Michael Smirk (Analytical Chemist)	Earth and Environment Analysis Laboratory (UWA)	University of Western Australia, 35 Stirling Highway, Crawley, WA 6009	Australia	Michael.Smirk@uwa.edu.au
Stephanie Cameron (Operations Manager)	East West EnviroAg	82 Plain St, Tamworth, NSW 2340	Australia	Stephanie.c@eastwestonline.com.au
Graham Lancaster (Laboratory Manager)	Environmental Analysis Laboratory	University Store, Military Road, East Lismore, NSW 2480 PO Box 5125, East Lismore, NSW 2480	Australia	Graham.Lancaster@scu.edu.au
James Stangoulis (Associate Professor)	Flinders University Plant Nutrition	Science and Engineering Store, Car Park 9, Physical Sciences Rd, Bedford Park, Adelaide, South Australia 5042 GPO Box 2100, Adelaide, SA 5001	Australia	james.stangoulis@flinders.edu.au
Eva Comino	Inorganic Chemistry Laboratory	Forensic and Scientific Services, 39 Kessels Road, Coopers Plains, Queensland, 4108	Australia	Eva.comino@health.qld.gov.au

Name (position)	*Facility*	*Street and/or Postal Address*	*Country*	*Email*
Rabeya Akter (Senior Technical Officer)	Mark Wainwright Analytical Centre UNSW - The University of New South Wales	Room B36 Chemical Science Building (F10), High Street, Kensington, NSW 2052	Australia	r.akter@unsw.edu.au
Stacey Hawkins (Supervisor)	MPL Laboratories	16 Hayden Court, Myaree, Western Australia, 6154	Australia	shawkins@mpl.com.au
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** Withdrew after the first round of the year – laboratory closure

Appendix 2: Homogeneity data and statistical assessments* for Total Plant N% (Dumas N) on the 12 test plant samples in 2020.

Sample name		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
Sub-sample													
1	Rep 1	1.51	3.06	0.798	4.16	1.74	2.57	2.75	4.24	1.00	2.35	3.33	1.46
	Rep 2	1.52	3.07	0.795	4.20	1.73	2.62	2.89	4.21	1.09	2.37	3.31	1.42
2	Rep 1	1.52	3.06	0.797	4.16	1.75	2.58	2.88	4.25	1.02	2.38	3.32	1.46
	Rep 2	1.54	3.06	0.798	4.14	1.73	2.60	2.76	4.23	1.08	2.38	3.31	1.43
3	Rep 1	1.54	3.07	0.798	4.16	1.74	2.61	2.79	4.24	1.03	2.35	3.29	1.44
	Rep 2	1.53	3.06	0.789	4.15	1.74	2.62	2.74	4.23	1.01	2.35	3.30	1.43
4	Rep 1	1.53	3.06	0.793	4.16	1.74	2.58	2.92	4.22	1.06	2.36	3.30	1.42
	Rep 2	1.52	3.06	0.797	4.12	1.73	2.58	2.76	4.25	1.01	2.37	3.30	1.42
5	Rep 1	1.55	3.06	0.793	4.19	1.71	2.63	2.82	4.25	1.06	2.51	3.30	1.42
	Rep 2	1.52	3.06	0.793	4.14	1.74	2.60	2.66	4.24	1.12	2.36	3.29	1.42
6	Rep 1	1.52	3.07	0.797	4.15	1.73	2.56	2.70	4.23	1.06	2.36	3.33	1.43
	Rep 2	1.52	3.05	0.794	4.15	1.74	2.63	2.79	4.24	1.02	2.34	3.30	1.43
7	Rep 1	1.52	3.07	0.794	4.16	1.73	2.58	2.84	4.23	1.09	2.35	3.31	1.42
	Rep 2	1.52	3.05	0.798	4.17	1.73	2.64	2.85	4.26	1.12	2.33	3.30	1.43
8	Rep 1	1.53	3.06	0.804	4.17	1.73	2.60	2.71	4.23	1.01	2.34	3.32	1.41
	Rep 2	1.53	3.07	0.799	4.16	1.75	2.64	2.73	4.26	1.08	2.36	3.32	1.42
9	Rep 1	1.53	3.06	0.797	4.19	1.75	2.57	2.74	4.26	1.09	2.36	3.32	1.43
	Rep 2	1.52	3.06	0.797	4.14	1.74	2.59	2.82	4.25	1.01	2.34	3.31	1.43
10	Rep 1	1.53	3.07	0.798	4.15	1.75	2.63	2.79	4.16	1.05	2.36	3.32	1.42
	Rep 2	1.52	3.07	0.800	4.11	1.74	2.60	2.73	4.25	1.07	2.33	3.32	1.42
Mean		1.53	3.06	0.796	4.16	1.74	2.60	2.78	4.24	1.05	2.36	3.31	1.43
Analytical SD		8.9E-05	5.7E-05	7.7E-06	0.00056	0.00011	0.0008	0.0055	0.00065	0.00164	0.00124	0.0001	0.00014
Sampling SD		0	0	3.2E-06	0	0	0	0	0	0	0.00018	5.7E-05	2.2E-05
SD proficiency data		0.0572	0.0944	0.0373	0.155	0.073	0.07	0.1497	0.124	0.0474	0.0696	0.112	0.0636
Status		**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.

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" (††) and "stragglers" (†) 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- μ)/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" (††). 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" (†).

The other statistics summarized 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 2020.

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) 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 with HF, and uptake in HCl	AA
Dry Ashing with HF, and uptake in HNO_3	AB
Dry Ashing with HF, and uptake in H_2SO_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_2SO_4	AF
Extraction with acid(s)	BA
Extraction with water	BB
Finely-divided dry sample	CA
Microwave digestion - closed system with HF, and final medium H_2SO_4	DA
Microwave digestion - closed system with HF, and final medium HNO_3 and/or HCl	DB
Microwave digestion - closed system with HF, and final medium $HClO_4$	DC
Microwave digestion - closed system without HF, and final medium H_2SO_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 HCIO4	DF
Microwave digestion - open system with HF, and final medium H_2SO_4	DG
Microwave digestion - open system with HF, and final medium HNO_3 and/or HCl	DH
Microwave digestion in open system with HF, and final medium $HClO_4$	DI
Microwave digestion - open system with HF, and final medium HNO_3 / peroxide	DJ
Microwave digestion - open system without HF, and final medium H_2SO_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,and 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 with HF, and final medium H_2SO_4	GA
Wet digestion - open system with HF, and final medium HNO_3 and /or HCl	GB
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_2SO_4 (includes Kjeldahl – not quantitative for NO_3)	GE
Wet digestion - open system without HF, and final medium H_2SO_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_2SO_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 used 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_2O-acetylene	14
AAS-Flame with deuterium background correction, using N_2O-acetylene	15
AAS-Flame with Zeeman background correction, using N_2O-acetylene	16
AAS-Flame with pulsed hollow cathode lamp background correction, using N_2O-acetylene	17
Chromatography	18
Cold vapour technology	19
Flame emission	20
Gravimetric	21
Hydride technology and similar	22
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 2020: Total Aluminium (mg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	DE-23	16.8	142	114	3.45	2.87	1.06	46.4	348	8280	31.6	1160	1.16
8888	DE-23	16.9	225 ††	118		3.18	2.62	48.7	402	8520	33.1	1150	2.7
10156	GI-23	21 ††	115	88.9	12.2 ††	3.75	3.19	38.3	331	7620	28.4	1090	5.08
10173	DN-24	16.6	135	106	3.38					7500	33.4	1050	2.14
11079	DE-23									7250	30.1	1110	2.77
20204	GJ-23					22.4 ††	22.6 ††	42	439	7190	97.2 ††	1170	0.2
21088	DE-23	17	136	84	5				313	6140 ††	27	1150	3
21100	DE-24	11.8 ††	81.6 ††	47.9 ††	3.08	2.95	2.1	45.6	181	8550	28.2	1230	2.17
21178	DE-23	16	127	88	5	1.8	3.7	41	140 ††	7250	23.4	1050	1.51
21229	GI-23	18.3	140	99.6	8.2 †	2.6	1.7	44.2	266	7470	27	1080	4.66
21230	DE-23	16.4	134	113	2.67			35.6	262	7230	23.7	940 †	
21232	DE-23	18.6	136	115	5.18	1.87	3.73	48	371	7510	31.4	1120	
50004	DE-23	13.7 †	133	103	2.37	2.97	2.76	63.1	378	7880	30.7	1120	1.27
50005	GJ-23	16.7	127	108	3.56	2.47	4.21	46.2	324	7280	30.9	1030	2.49
50011	DE-23	19.8 †	148	119	4.99	2.62	2.31	44.2	326	7600	31.9	1290 ††	4.44
50012	DN-23	16.2	123	99.9	4.7	4.34	1.74	53.9	375	8360	29.1	1120	3.19
50014	DE-23	16.8	139	98	4.77	2.8	1.8	55.1	258	7970	44.7 ††	1110	1.53
50017	DE-23	16.9	119	99.4	3.37	3.63	3.44	62.1	417	8020	34.8	1180	2.4
50020	GI-23	17	99.2 †	77.8	9.4 ††			32.5	183	8380	45.6 ††	1220	10 ††
50024	GJ-23	14.5 †	126	97.4	3.05	3.1	1.4	42.2	294	7700	35.6	1090	1.9
50027	DN-23	16.6	128	104	3.2	2.4	3.3	45.6	295	7900	28.2	1120	0.87
50029	AD-23	13.6 †	131	102	3.15	2.08	2.19	55.7	292	7920	25.4	1220	3.1
52283	GJ-23	18.6	134	103	2.08	1.86	4.67	36.1	233	7940	28.5	1110	1.67
52491	GI-23	11.8 ††	84 ††	42.5 ††	4.87	5.44 †	5	36.3	152	7590	18.6 ††	1080	3.5
52495	GI-24	9.45 ††	124	80	5.92	1.49	4.15	64.7	227	7120	37.6 †	1060	7.54 ††
52565	DN-23	18.5	120	101	5	8.6 ††	8 ††	46.9	304	6860	29.1	958 †	5
52610	DE-24	11 ††	96 ††	63 †	2								
52636	DE-23	15.9	109	81.4	8.63 †	4.53	3.14	36.9	319	5740 ††	21.2	800 ††	4.84

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Boron (mg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	DE-23	0.589	46.7	3.32	10.9	1.21	14	41.4	14.5	50.6	35.8	20.9	0.843
8888	DE-23	0.956	44	3.19	9.97	1.01	13.5	41.7	14.1	50.1	35.3	20.9	0.781
10156	GI-23	5.8 ††	32.8 ††	7.4 ††	11.5	3.65 ††	14.7	38.7	15.4	44.3	31	19.6	2.95 ††
10173	DN-24	0.948	40.4	3.38	9.21	1.09	14.6	43.5	15.2	45.3	32.4	19.1	0.998
11079	DE-23									48.5	35.3	20.3	0.95
20204	GJ-23	1.66	41.5	2.94	7.53 ††	1.14	12.9	41.6	13.9	47.6	31.8	20.4	0.68
21088	DE-23	1.2	38 †	3.3	10		12 †	33 ††	15	46	28 †	22	2.26 ††
21100	DE-24	2.61 ††	44.1	3.87	11.5	1.94 ††	18.2 ††	43.1	14.4	48.4	32.8	20.5	1.45 †
21178	DE-23	1.4	49	4.5 †	11	1.2	14	40	14	46.4	32.6	18 †	1.06
21229	GI-23	1.75	44	4.07	11.2	1.73 †	13.9	41.7	14.5	50.6	34.4	21.3	1
21230	DE-23	0.1 †	43.7	2.2 ††	9.17	0.598 †	8.69 ††	28.9 ††	9.25 ††	38.9 ††	26.7 ††	15 ††	0.0333 ††
21232	DE-23	1.19	44	3.24	9.93	1.05	12.7	37.1	13.5	47.6	33.9	20.1	
50004	DE-23	0.864	46.7	5.21 ††	11.1	1.09	14.5	44.3	14.8	49.3	35.5	20.8	1.17
50005	GJ-23	1.19	45	3.53	9.96	1.51	14.2	41.4	15.3	44.5	31.6	19.6	2.01 ††
50008	AD-23	1.31	42.7	2.8	9.79	1.15	11.9 †	36.8	12.7 †	46.5	32.6	19.8	0.837
50011	DE-23	1.06	47.1	3.65	10.9	1.29	14.1	40.1	15	48.9	35.4	21.6	1.39
50012	DN-23	1.81 †	44.5	3.73	10.2	0.98	13.3	45.8	16.1	53.9	38.3	22.3	0.845
50014	DE-23	1.11	46.7	3.31	10.5	0.6 †	13.7	44.8	14.5	52.1	36	21.2	0.55
50017	DE-23	1.75	44.7	3.93	10.9	1.35	13.7	41	15	48.2	34	21.2	1.14
50020	GI-23	1.1	50.4	3.7	11.8		11.1 ††	38.9	14.8	53.9	39.6 †	22.9	
50024	DE-23	3.5 ††	48.2	7.4 ††	11.3	1.43	14.1	41.8	15.9	45	31.9	21.6	0.78
50025	GJ-23	8.3 ††	45	9.88 ††	15.9 ††	9.2 ††	20 ††	48.6 ††	21.1 ††	52.6	39.4 †	26.2 ††	8.63 ††
50027	DN-23	0.8	42.8	3.21	9.8	1	13.6	41.6	15.1	48.8	33.5	20.1	0.7
50029	AD-23	2.35 †	49.6	4.43 †	11.8	1.84 †	14.8	41.1	15	51.6	36.5	21.9	0.909
52283	GJ-23	1.02	47.9	3.69	10	1.19	14.3	41.8	13.3	48.9	33.2	21.1	0.741
52384	DE-23	7.08 ††	47.9	9.43 ††	13.4 ††								
52491	GI-23	0.184 †	41	2.14 ††	8.37	0.8	14	42.6	14.8	52.6	36.5	23.4	0.95
52494	GG-23	1.2	43.5	3.5	10.1	2.29 ††	14.7	42.2	15.7	45.4	33.1	19.5	1.2
52495	GI-24	0.993	47.4	3.41	10.7	1.08	15	46	16.1	52	36.5	20.9	0.718
52508	AE-23							1.98 ††	0.79 ††	49.5	32.5	17.2 ††	28.8 ††
52565	DN-23	1.16	45.1	3.19	10.1	0.8	12.8	38.4	13 †	41.3	29.6	18.1 †	1.1
52632	DE-30	53.5 ††	67.9 ††	9.75 ††	26.2 ††								
52636	DE-23	2.7 ††	45.1	2.65	9.54	3.53 ††	13.2	37.1	13.5	33 ††	21.6 ††	10.6 ††	0.82

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Cadmium (µg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	DE-24	43.7	7.97	21.5	6.12	0.632	9.18	477	1300	16.7	250	50.5	0.301
10173	DN-24	57.8	23.4 ††	38.9 ††	26.1 ††	3.54	9.7	450	1140	16.4	236	45	5.42 ††
11079	DE-23									170 ††	220	60 ††	10 ††
20204	GJ-23	43	35.7 ††	28.8	6.33	34.8 ††	13.7	412	1030	23.4 ††	243	56.3	6.58 ††
21088	DE-23	24 ††	4	25	1 ††			353	1040	20 ††	220	60 ††	0.03
21100	DE-24	51.5	9.63	25.3	11.1	2.35	13.7	481	1200	15.3	242	46	2.92
21178	DE-24	42	8	22	7	3.7	10	410	1100	18.4	249	48.1	2
21229	GI-24	45.3	7.5	23.4	9.95	5.87	9.86	454	1180	15.9	231	48.1	0.909
21230	DE-24	37.4	5.63	19.6	8.7	7.71 ††	11.2	436	1060	14.9	232	44.6	2.75
50004	DE-24	63.6 ††	9.77	31.4 ††	10.5	4.3	11	388	1020	14.2	210	41.9	1.41
50005	GJ-23	40.8	8.23	21	7.16	11.6 ††	6.71 ††	359	900 ††	16.1	241	51.1	5.17 ††
50011	DE-24	43.3	7.48	22.5	8.11	3.94	10.2	384	1030	14.8	241	47.8	1.1
50012	DN-24	43	6	23	7	3	7 ††	427	1080	14	253	51	2
50014	DE-24	50.7	18 ††	31 ††	10.8	3.67	9.67	430	1090	17.3	253	51.3	1.83
50020	GI-23	100 ††	100 ††	100 ††	100 ††			303 ††	746 ††		100 ††		
50024	GJ-24	47.2	7.1	24.1	9.1	4.9	15.2 ††	528	1380 ††	14	229	45.8	1.7
52491	GI-24					15.8 ††	13.5	468	1160	16	241	67.7 ††	1.37
52495	GI-24	41.1	7.62	21.5	7.2	3.29	11.2	459	1180	15.2	269	52.8	0.724
52528	GK-11									150 ††	200 ††	100 ††	50 ††
52565	DN-24	90 ††	50 ††	80 ††	60 ††	20 ††	20 ††	385	945	10 ††	220	51	10 ††
52610	DE-24	36	6.1	19	6.6								

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Calcium (%w/w)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	DE-23	0.011	1.05	0.347	0.103	0.049	0.035	0.88	1.43	1.52	1.4	0.579	0.023
8888	DE-23	0.011	0.975	0.317	0.096	0.05	0.033	0.873	1.39	1.52	1.38	0.572	0.022
10156	GI-23					0.05	0.034	0.788	1.28				
10173	DN-24	0.009	0.978	0.323	0.083	0.052	0.036	0.963	1.46	1.39	1.25 †	0.543	0.02
10181	GF-23	0.052 ††	1.86 ††	1.01 ††	0.083	0.0542	0.035	0.948	1.43	1.45	1.32	0.565	0.022
11079	DE-23									16.3 ††	14.7 ††	6.34 ††	0.24 ††
20204	GJ-23	0.014	0.947	0.333	0.086	0.015 ††	0.025 ††	0.85	1.39	1.44	1.33	0.593	0.01 ††
21088	DE-23	0.0109	0.917	0.313	0.093	0.0453 †	0.031	0.743	1.43	1.24 †	1.13 ††	0.589	0.0015 ††
21100	DE-24	0.0126	1.07 †	0.354	0.113	0.0673 ††	0.044 ††	1.05 ††	1.55	1.38	1.19 ††	0.535 †	0.0252
21178	DE-23	0.012	0.88 ††	0.3	0.1	0.052	0.034	0.85	1.3	1.45	1.34	0.561	0.0227
21190	AD-09	0.001 ††	0.976	0.306	0.267 ††	0.0521	0.039 ††	0.736	1.54	1.34	1.32	0.549	0.0236
21229	GI-23	0.0106	1.02	0.339	0.102	0.0527	0.033	0.891	1.4	1.49	1.33	0.563	0.0211
21230	DE-23	0.0098	0.939	0.314	0.094	0.0167 ††	0.012 ††	0.642 ††	0.962 ††	0.803 ††	0.732 ††	0.301 ††	0.00905 ††
21232	DE-23	0.0133	1	0.322	0.097	0.047	0.033	0.784	1.28	1.47	1.36	0.579	0.0248
21234	GH-09	0.015 ††	0.512 ††	0.159 ††	1.99 ††	0.089 ††	0.067 ††	2.17 ††	1.61	1.54	1.41	0.645 ††	0.025
50004	DE-23	0.01	1.08 ††	0.35	0.104	0.049	0.031	0.864	1.33	1.46	1.27	0.544	0.022
50005	GJ-23	0.0109	0.981	0.321	0.085	0.0524	0.033	0.895	1.5	1.53	1.34	0.587	0.0214
50008	GJ-23	0.012	1	0.32	0.097	0.049	0.031	0.9	1.37	1.52	1.35	0.569	0.022
50011	DE-23	0.013	1.03	0.334	0.104	0.055	0.035	0.847	1.38	1.45	1.36	0.585	0.026 †
50012	DN-23	0.0111	1.02	0.327	0.102	0.0509	0.032	0.941	1.47	1.43	1.37	0.6	0.0239
50014	DE-23	0.01	0.992	0.322	0.095	0.052	0.032	0.926	1.37	1.5	1.35	0.576	0.022
50017	DE-23	0.01	0.986	0.498 ††	0.334 ††	0.055	0.036	0.93	1.53	1.58	1.39	0.575	0.0298 ††
50020	GI-23	0.01	0.965	0.31	0.11	0.0446 †	0.029 †	0.616 ††	1.23	1.52	1.44 †	0.6	0.02
50024	GJ-23	0.011	1.02	0.338	0.105	0.053	0.033	0.84	1.35	1.43	1.33	0.56	0.022
50025	GJ-23	0.016 ††	0.958	0.326	0.104	0.053	0.033	0.838	1.22	1.47	1.35	0.573	0.027 †
50027	DN-23	0.011	0.967	0.328	0.097	0.0522	0.034	0.874	1.38	1.48	1.34	0.578	0.0227
50029	AD-23	0.0119	1.01	0.339	0.099	0.0513	0.033	0.815	1.33	1.4	1.33	0.565	0.0237
52283	GJ-23	0.016 ††	0.917	0.326	0.099	0.047	0.033	0.905	1.51	1.5	1.38	0.583	0.0235
52384	DE-23	0.02 ††	0.98	0.31	0.09								
52387	DE-14	0.008	1.2 ††	0.263 ††	0.103	0.11 ††	0.09 ††	0.74	1.29	1.19 ††	1.09 ††	0.53 †	0.19 ††
52491	GI-23	0.0104	0.983	0.316	0.096	0.0531	0.033	0.922	1.4	1.44	1.31	0.564	0.0222
52494	GG-23	0.011	0.958	0.317	0.094	0.051	0.034	0.875	1.4	1.43	1.31	0.563	0.021
52495	GI-24	0.0109	1.03	0.346	0.104	0.0508	0.032	1.07 ††	1.55	1.56	1.44 †	0.592	0.0247
52508	AE-23					0.072 ††	0.09 ††	0.96	1.44	1.65 †	1.59 ††	0.637 ††	0.0232
52565	DN-23	0.0124	0.982	0.325	0.096	0.0462 †	0.030 †	0.832	1.29	1.34	1.22 ††	0.498 ††	0.0234
52610	GG-23	0.0030 ††	0.957	0.304	0.085								
52632	DE-11	0.0046 ††	1.1 ††	0.339	0.094								
52636	DE-23	0.0111	0.96	0.289 †	0.089	0.056	0.035	0.925	1.49	1.21 ††	1.08 ††	0.461 ††	0.0194 †

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Carbon (%w/w)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	**ASP 2002-2**	**ASP 2002-3**	**ASP 2002-4**	**ASP 2005-1**	**ASP 2005-2**	**ASP 2005-3**	**ASP 2005-4**	**ASP 2008-1**	**ASP 2008-2**	**ASP 2008-3**	**ASP 2008-4**
22	CA-37	42.9	48.9	43.7	43.5	44.1	43.6 †	34 †	39.5	44.9	48.4	48.2	43.3
10156	CA-37	0.118 ††				42.7 ††	42.1 ††	32.6 ††	38.2	42.8 ††	46.3 ††	26.3 ††	40.7 ††
10173	CA-37	40.8 ††	47.4 ††	41.9	41.6 †					46.7	50.1 †	49.2	44.8 †
10181	CA-37	44.2	49.9	44.6	45	47.3	46	35.5	40.6	46	49	49	43
20204	CA-37	44.2	51.3 ††	45.6	44.8	45.8	45.2	34 †	40.4	45.4	49.3	49.1	42.1 †
21100	CA-37	40.5 ††	47 ††	41.5	41 ††	46.8	45.4	36.4	40.8	46.5	50.1 †	49.7	44.7 †
21229	CA-37	43.3	47.2 ††	43.1	42.2 †	45.4	45.1	36.4	41	45.8	46.2 ††	48	43.1
21230	CA-37	43.5	48.9	42.3	43.6	45.8	44.8	35.5	39.8	45.2	48.7	48.3	43.4
50004	CA-37	43.7	49.2	43.9	44.2	46.2	45.4	36.2	41.2	44.9	48.7	48.2	43.1
50005	CA-37	43.7	49.6	44	43.5	47.1	46.7 †	36	42.2	45.6	49.1	48.8	42.5
50008	CA-37	43.1	48.9	43.5	44	46.3	45.2	36.1	40.4	45.1	48.5	48	43.3
50011	CA-37	43.5	50	44.8	44.3	45.7	45.6	35.7	42.8	45.8	49.2	49	43.4
50012	CA-37	45.1	51.1 ††	45.6	45.5	47.8	46.7 †	37.5	42.1	47.5 ††	51.2 ††	51 ††	45.6 ††
50014	CA-37	44.4	49.7	44.4	45	47.2	46.4 †	37.1	41.5	46.4	49.8	49.4	44.5 †
50017	CA-37	44.2	48.9	43.4	44.4	46.1	45.2	36.7	40.4	44.9	48.6	47.8	43.3
50020	CA-37	44.3	49.7	44.7	44.5	46.9	36.8 ††	46.5 ††	41.2	45.8	49.1	48.4	43.6
50024	CA-37	43.3	49	43.7	43.6	44.3	44.2 †	33.6 ††	39.5	45.3	48.3	47.9	41.9 †
50027	CA-37	48.2 ††	43.7 ††	43.4	42.2 †								
50029	CA-37					42.6 ††	42.1 ††	32.8 ††	38.3	45.2	48.7	48.6	42.7
52283	CA-37	43.9	49.7	44.1	44.2	46.8	45.3	36.3	40.2	46.3	48.6	48.7	43.1
52491	CA-37	40.9 ††	47.6 †	42.2	41.5 †	45.8	45.3	36.5	40.2	46.4	49.9	49.4	44.1
52495	CA-37	43.6	49.2	43.9	43.8	46.2	45.2	36.1	41	45.6	49.2	49	44.1
52565	CA-37	40.7 ††	47.5 †	42.1	41.3 ††	42 ††	42 ††	32 ††	38	42.9 ††	46.4 ††	46.3 ††	40.4 ††
52632	CA-37	44.5	50.1	44.8	44.8								
52636	CA-37	42.9	49.6	44	43.6	44.2	44 †	34.4 †	39.9	45.2	49	48.3	43.2

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Chloride (mg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	**ASP 2002-2**	**ASP 2002-3**	**ASP 2002-4**	**ASP 2005-1**	**ASP 2005-2**	**ASP 2005-3**	**ASP 2005-4**	**ASP 2008-1**	**ASP 2008-2**	**ASP 2008-3**	**ASP 2008-4**
22	BA-32	227	1580	7700	1460	479	502	11900	2780	108	537	1100	1310
10173	BA-27					443	460	12600	2700	60.2	550	1100	1370
20204	BB-27	249	1420	7260	1160	226 ††	482	12400	3860 ††	478	1130 ††	1290	938
21088	BB-31	223	1860	6980	1410	451	504	11600	3480 †	1030 ††	1940 ††	2370 ††	1270
21100	BB-31	453 ††	2470 ††	7980	3380 ††	989 ††	2060 ††	21000 ††	7570 ††	232	1110 †	2160 ††	2170 ††
21178	BB-28	200	1600	8300	1300	480	420	11000	2800				
21229	BB-31	202	1540	7550	1160	422	439	11900	2470	142	484	929	1060
21230	BB-28	237	1600	7550	7610 ††								
21232	BB-31	500 ††	1500	6630 ††	1000	500	500	9000 ††	2000 †	250	536	962	1110
50005	BB-32	192	1660	7350	1550	656 ††	465	11200	2530	175	539	1250	1130
50011	BB-31	302	1970	7730	1610	444	503	11800	2860	375	583	1070	1110
50012	BB-31	209	1720	7960	1400	461	484	13500	3200	251	564	1150	1230
50014	BB-31	200	1800	7800	1300	400	400 †	13600	2900	400	700	1400	1400
50020	BA-31	113 †	1620	7790	1040	307 ††	311 ††	12900	3050	2470 ††	2470 ††	3080 ††	968
50027	BB-32	170	1320	7470	1130	250 ††	430	11800	2480	130	410	1030	1270
50029	BB-31	368 †	2360 ††	7820	1420	585 †	618 ††	12600	4550 ††	1070 ††	1660 ††	2550 ††	1090
52494	BA-32	345 †	1510	7360	1370	475	483	12100	2670	171	144 †	990	1150
52565	BA-31	391 †	1440	6230 ††	1290	638 ††	834 ††	11800	2630	696 †	905 †	1230	1280
52632	BB-31	796 ††	3370 ††	7480	2760 ††								

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Cobalt (µg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	DE-24	12.3	1400	100	927	15.5	29.3	51.2	187	11.7	30.1	102	2.69
8888	DE-24		1400	110	860		30	100 ††	260 ††	20.3	39.1	133 ††	
10173	DN-24	11.4	1290	96.3	847	15.5	29.5	73.7	193	31.1	44.9	104	6.2
20204	GJ-23	70 ††	1120 ††	122 ††	815	30.7 ††	20.6 ††	51	91.2 ††	97.8 ††	139 ††	109	27.5 ††
21088	DE-23	33 ††	1220	156 ††	876	22	35	72	218	78 ††	50	138 ††	12
21100	DE-24	7.65	1450	110	976	12.6	30.4	58.4	186	26.1	41.8	126	31.7 ††
21178	DE-24	15	1320	98	870	22	34	63	180	30.4	41.1	107	15.3 ††
21229	GI-24	14.9	1130 ††	99.9	1070 ††	19.8	30.7	48.4	168	19.9	30.7	110	6.3
21230	DE-24	36.8 ††	1170	115	776 ††	41.6 ††	56.5 ††	94.3	216	53.1 ††	63.3 ††	141 ††	34.3 ††
50004	DE-24	8.58	1390	92.4	902	15	23.8	53.1	158	19.9	35.5	114	3.94
50005	GJ-23	13.4	1290	102	901	9.88	22.8	64.2	178	20.2	38.6	111	8.24
50011	DE-24	18	1400	111	919	22.3	35.5	74.5	225	28.2	42.8	116	13.1
50012	DN-24	15	1300	99	874	16	28	66	202	17	31	97	3
50014	DE-24	19.2	1360	110	905	14.3	28.3	55	179	21.7	31.7	105	4
50020	GI-23	200 ††	1680 ††	200 ††	1120 ††						1000 ††		
50024	GJ-24	12.2	1330	99.1	923	28.5 ††	41.6 ††	74.7	215	18.9	34	104	5.4
50027	DN-23	10	1480	94	950	10	33	67	213				
50027	DN-24									24	39	108	8
50029	AD-23	23.8 ††	1390	115	967	18.8	34.8	59.1	201	19.5	32.4	119	13.5
52491	GI-24					16.3	34.8	68.1	210	20.5	27.4	86.5 ††	3.92
52495	GI-24	11.3	1380	105	918	16	31.8	68	206	25.8	41.3	117	6.09
52565	DN-24	10.5	1290	102	868	23	33	58	170	30	43	113	14
52610	DE-24	11	1300	95	870								
52636	DE-23					76.4 ††	45.3 ††	49.4	281 ††				

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Copper (mg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	DE-23	4.16	11.2 ††	3.8	8.06	3.92	5.1	10.5	9.06	4.63	37.7	7.82	6.16
8888	DE-23	3.81	8.9	3.69	7.67	3.99	4.95	11.5	9.65	4.73	36.5	8.09	5.94
10156	GI-23	4	7.8	4	7.5	4.36	5.27	9.97	9.14	4.19	29.2 †	6.54	5.18
10173	DN-24	3.47	8.42	3.35	7.59	3.81	4.88	11	8.74	3.48 ††	34	6.56	5.09
11079	DE-23									4.48	36.2	7.83	5.97
20204	GJ-23	4.2	6.02 ††	3.44	8.97 ††	4.2	5.5	12.2 †	10.9 ††	0.16 ††	31.4	7.46	7.22 ††
21088	DE-23	3	7.1 ††	3	7	3.5	5.6	9.6	9.7	4.8	31.5	9.2 †	4.6
21100	DE-24	3.8	9.61	3.93	8.44	4.1	5.05	11.4	9.49	5	38.6	8.52	6.47
21178	DE-23	3.5	8.1	3.2	7.1	4.4	5.4	12	9.4	4.44	34.7	7.5	5.76
21190	AD-13	2.98	9.38	3.53	7.53	3.1	5.4	0.65 ††	7.83	4.48	32.6	7.5	4.77
21229	GI-23	3.77	9.3	3.62	8.23	3.87	4.82	10.3	8.36	4.37	34.7	7.57	5.82
21230	DE-23	3.53	8.73	3.33	7.43	3.29	4.08 ††	10	8.06	4.43	33.8	7.16	5.5
21232	DE-23	3.33	8.76	3.21	7.42	3.25	4.07 ††	9.14	8.03	4.28	33.6	7.45	5.25
21234	GH-09	3.61	8.68	3.33	7.24	3.74	4.85	10.8	9.47	4.4	33.7	7.07	5.19
50004	DE-23	3.62	8.56	3.38	7.61	3.96	4.68	9.98	8.64	4.24	31.7	6.77	5.35
50005	GJ-23	3.87	8.18	3.57	7.46	4.53	5.32	9.97	8.59	4.67	31.4	7.61	5.88
50008	GJ-23	4.41	8.9	3.96	8.52	4.12	4.94	10.5	8.67	4.35	32.4	6.7	5.67
50011	DE-23	4.05	9.25	3.75	8.36	4.4	5.12	10.3	9.08	4.3	34	7.64	6.05
50012	DN-23	3.96	8.37	3.1	7.29	3.55	4.38	10.3	8.59	5.18 †	39.8 ††	8.82	6.85
50012	DN-24									3.9	31.8	6.78	5.13
50014	DE-24	3.87	8.84	3.59	7.92	3.93	4.77	10.5	8.56	4.24	33.9	7.08	5.65
50017	DE-23	3.49	6.13 ††	3.11	8.26	4.29	5.21	11.3	9.65	4.44	35.1	7.83	5.87
50020	GI-23	3.99	8.48	3.21	8.05	3.44	4.25	9.61	10.4	6.94 ††	34.7	7.99	5.51
50024	GJ-23	3.82	9.57	3.48	7.99	3.98	5.06	10.8	9.43	4.7	35.3	7.8	5.4
50025	GJ-23	4.5	8.37	3.9	8.44	5.34 ††	6.17 ††	12.5 ††	9.55	5.47 ††	31.2	8.54	7.54 ††
50027	DN-23	3.44	8.77	3.48	7.46	3.73	4.75	10.7	9.15	4.4	34.5	7.5	5.4
50029	AD-23	2.63 ††	9.94	3.47	8.69	3.77	5.42	8.42 ††	8.46	4.85	36.9	8.09	6.07
52283	GJ-23	3.95	8.73	3.52	7.95	4.82	4.92	10.9	9.25	4.46	34.2	7.53	6.04
52384	DE-23	4.68	10.5 ††	4.03	8.37								
52387	DE-11	3.31	8.17	3.21	7.06	4.84	7 ††	11.8	11.8 ††	4.61	35.9	8.17	6.88 †
52491	GI-23	3.49	8.42	3.34	7.36	4.29	5.35	11.6	9.8	4.61	36.2	7.67	5.72
52494	GG-23	3.4	8.4	3.6	7.3	3.58	4.76	10.5	9.43	4.09	33.1	6.89	5.3
52495	GI-24	3.63	8.64	3.57	7.9	4.13	5.08	11.9	10	4.79	37.6	7.94	6.25
52508	AE-23					4.04	4.8	1.19 ††	1.59 ††	4	34.1	6.88	5.63
52528	GK-09									5.68 ††	60.7 ††	10.4 ††	7.63 ††
52565	DN-23	3.81	9.84	3.87	7.88	4.3	5.2	11	9.4	6.2 ††	33.1	10.1 ††	6.6
52610	DE-24	3.4	8	3.3	7.3								

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Copper (mg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	**ASP 2002-2**	**ASP 2002-3**	**ASP 2002-4**	**ASP 2005-1**	**ASP 2005-2**	**ASP 2005-3**	**ASP 2005-4**	**ASP 2008-1**	**ASP 2008-2**	**ASP 2008-3**	**ASP 2008-4**
52632	DE-11	2.6 ††	8.51	2.94	6.49								
52636	DE-23	5.82 ††	9.1	4	7.67	3.64	4.45	10.3	9.02	3.74 †	29.7	6.41	4.6

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Iron (mg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	DE-23	23.6	166	81.7	47.7	27.6	42.5	36.1	340	54	55.6	369 ††	37.8
8888	DE-23	25	180	83.3	43.9	27.8	42.5	39.6	330	55.1	54.7	530	39
10156	GI-23	24.8	142	71.2	43.6	37.6	46.2	42.3	245 ††	54.9	48.4	268 ††	35.3
10173	DN-24	18.8 †	183	82.9	42.2	29.5	44.1	61.2 ††	365	80.7 ††	76.3 ††	526	30.6 ††
11079	DE-23									58.1	59.5	557	42.8
20204	GJ-23	26	146	79.5	62.9 ††	23 †	48.3	39.8	362	46.5 ††	46	506	25.1 ††
21088	DE-23	21	152	71	43				345	60	38 ††	551	42.1
21100	DE-24	56.6 ††	136	67.3	55.6 ††	44.4 ††	63.7 ††	44.2	335	58.4	53.6	424	45.9 †
21178	DE-23	25	155	73	44	31	50	45	290	51.8	49.8	465	37.2
21190	AD-13	8.52 ††	141	67.1	33.6 ††	39.8 ††	44.2	36.3	322	42.9 ††	47.9	347 ††	35.4
21229	GI-23	23.7	144	80.4	50.1	31.7	46.8	34.8	319	58.5	56.7	510	40.7
21230	DE-23	24.9	181	90.5	49.9	15.3 ††	27.9 ††	40.7	354		41.5 ††	408	25.8 ††
21232	DE-23	25.6	171	83.4	46	25.7	42.4	34.1	337	64.5 †	59.2	499	38.6
21234	GH-09	19.7	156	81.6	44.3	24.4	41.4	40.5	316	63.2	58.6	461	38.7
50004	DE-23	22	159	83.9	46.7	30.2	46	38.7	345	57.9	56.2	503	38.8
50005	GJ-23	27.7	163	80	54.6 ††	32.8	49.1	39.7	343	55.7	50.9	489	36.4
50008	GJ-23	24.6	154	77.2	46.7	30.7	43.3	34.8	308	52.8	50.7	455	37.8
50011	DE-23	25.1	169	86.4	50.3	30.3	46.2	37.1	348	55.8	54.8	495	40.8
50012	DN-23	22.9	155	77.8	45.2	35.2	45.7	40.6	372	74.2 ††	57.4	547	41.3
50014	DE-23	22.7	159	81	46.7	29.7	45.3	40.7	338	58.7	56.7	471	38.7
50017	DE-23	23.9	160	75.5	47.9	31.4	48.2	41.9	384	60.7	58.6	521	45.5 †
50020	GI-23	28.2	131	62.8 ††	39.5	28.4	35.5 ††	32.9	320	60.6	64.4	509	56.3 ††
50024	GJ-23	23.6	157	82.2	48	33.3	43.3	33.2	325	51.4	51.9	486	36.5
50025	GJ-23	24.6	151	75.6	45.4	32.1	45.5	40.2	327	57	58	544	45.3 †
50027	DN-23	22.3	149	79	45	28.5	47.4	37.9	366	48.9 †	58.5	486	39.3
50029	AD-23	35.5 ††	174	89.7	53.4 ††	31.1	53.5 †	40.5	317	58	58.9	517	44.1
52283	GJ-23	22.9	147	78.8	43.5	33.8	47.7	39.2	346	55.4	54.2	489	40.7
52384	DE-23	33.9 ††	163	91.8	53.9 ††								
52387	DE-11	23.2	165	88	46.8	26.2	39.3	32.8	326	58.1	55.6	546	39.3
52491	GI-23	20.1	123 ††	56.9 ††	44.8	28.5	44.1	32.1	289	49.9 †	51.4	445	39.2
52494	GG-23	18.3 †	126	60.4 ††	40.3	37.5	48.1	38.8	306	61.9	52.8	469	36.8
52495	GI-24	20.1	149	73.6	45.6	30.4	47.8	42.8	349	58.7	57.1	536	40.9
52508	AE-23					35.3	39.1	29 ††	24.5 ††	56.9	51.5	266 ††	37.5
52528	GK-11									55.1	35.3 ††	369 ††	56.3 ††
52565	DN-23	18.5 †	156	77	41.6	20.8 ††	36 ††	26.8 ††	288	42 ††	42.5 †	453	26.3 ††
52610	DE-24	20	130	65 †	42								
52632	DE-11	38.6 ††	150	70.3	18.2 ††								
52636	DE-23	26.1	171	80.9	46.5	33.2	45.9	40	358	51.5	48.9	431	33.5

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Lead (µg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	**ASP 2002-2**	**ASP 2002-3**	**ASP 2002-4**	**ASP 2005-1**	**ASP 2005-2**	**ASP 2005-3**	**ASP 2005-4**	**ASP 2008-1**	**ASP 2008-2**	**ASP 2008-3**	**ASP 2008-4**
10173	DN-24	19.5	69.6	69.8	8.12	4.35	4.3	75.8	253	71.1	62.4	158	11.8
20204	GJ-23	21.8	48 ††	71.2	17.1	18.9	10	60.3	123 ††	1 ††	340 ††	159	19.7
21088	DE-23	0.1 ††	0.3 ††	0.3 ††	0.1					100	100 ††	200	30 ††
21100	DE-24	15.6	68.3	74.5	3.51	3.98	1.24	71.3	247	83	68.8	188	10.8
21178	DE-24	40 ††	69	83	7	5.5	5.2	66	200	85.5	64.8	153	15.7
21229	GI-24	13.4	58.2 ††	70.1	6.59	7.73	6.87	60.4	208	85.1	56.4	160	28.8 ††
21230	DE-24	18.6	64.6	72	8.2	15.5	13.8 ††	69.7	237	92.4	67.1	160	15.2
50004	DE-24	22.7	106 ††	133 ††	31 ††	10.7	4.78	75.9	277	90.4	68.7	196	13
50005	GJ-23	17.7	51.9 ††	74.8	20.1 ††	26.6 ††	8.01	66.2	50.2 ††	82.7	61.9	175	33.4 ††
50011	DE-24	18.2	70.6	80.8	5.03	6.7	5.85	67.3	229	84.4	68.2	143	21.4
50012	DN-24	30	70	72	15	5	5	64	232	75	51	144	2 ††
50014	DE-24	35 ††	61	57.7 ††	50 ††	50 ††	50 ††	62.2	207	59.8	35.2 ††	133	50 ††
50020	GI-23	500 ††	500 ††	500 ††	643 ††					2340 ††			
50024	GJ-24	18.1	66.4	74.3	6.9	47 ††	46 ††	96 ††	295	94.5	53.5	151	5
52491	GI-24					7.94	2.03	61.5	207	70.4	56.2	140	12.7
52495	GI-24	16.7	74.2	73.6	2.95	7.47	3.44	70.9	246	96.4	68.5	169	12.2
52528	GK-11									5000 ††	3000 ††	2500 ††	5250 ††
52565	DN-24	580 ††	580 ††	680 ††	540 ††	20 ††	20 ††	60	110 ††	26 ††	17 ††	332 ††	10
52610	DE-24	14	69	60									

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Magnesium (%w/w)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	DE-23	0.148	0.219	0.223	0.14	0.123	0.174	0.17	0.847	0.079	0.37	0.265	0.1
8888	DE-23	0.134	0.211	0.199	0.127	0.123	0.17	0.173	0.785	0.081	0.352	0.263	0.097
10156	GI-23	0.188 ††				0.115	0.158 †	0.154 †	0.658 ††				
10173	DN-24	0.124	0.201	0.194	0.116	0.128	0.181	0.173	0.78	0.074	0.327	0.246	0.095
10181	GF-23	0.123	0.29 ††	0.307 ††	0.311 ††	0.131	0.175	0.19	0.825	0.0833	0.341	0.255	0.0921
11079	DE-23									0.827 ††	3.57 ††	2.7 ††	1.1 ††
20204	GJ-23	0.144	0.218	0.209	0.128	0.137	0.174	0.178	0.757	0.074	0.358	0.269	0.092
21088	DE-23	0.125	0.188	0.19	0.119	0.102 ††	0.151 ††	0.15 ††	0.815	0.072 †	0.307 ††	0.286 †	0.084
21100	DE-24	0.151	0.226	0.216	0.146	0.156 ††	0.222 ††	0.204 ††	0.889	0.0772	0.31 ††	0.244	0.103
21178	DE-23	0.13	0.2	0.19	0.13	0.13	0.18	0.17	0.75	0.0806	0.338	0.252	0.0932
21190	AD-13	0.156 †	0.232	0.223	0.146	0.124	0.168	0.127 ††	0.885	0.0777	0.352	0.262	0.0914
21229	GI-23	0.137	0.214	0.21	0.137	0.128	0.179	0.175	0.835	0.0791	0.343	0.257	0.0954
21230	DE-23	0.131	0.196	0.194	0.124	0.045 ††	0.072 ††	0.151 ††	0.808	0.0381 ††	0.2 ††	0.132 ††	0.031 ††
21232	DE-23	0.138	0.212	0.204	0.129	0.111 ††	0.16 †	0.165	0.742	0.0815	0.355	0.265	0.0948
21234	GH-09	0.137	0.218	0.212	0.133	0.12	0.21 ††	0.213 ††	0.76	0.069 ††	0.3 ††	0.233 ††	0.08 ††
50004	DE-23	0.139	0.214	0.214	0.137	0.128	0.172	0.171	0.795	0.083	0.349	0.26	0.096
50005	GJ-23	0.136	0.208	0.202	0.131	0.128	0.177	0.179	0.98 ††	0.0781	0.341	0.263	0.0947
50008	GJ-23	0.142	0.208	0.206	0.13	0.129	0.179	0.179	0.856	0.084	0.347	0.258	0.104
50011	DE-23	0.144	0.218	0.215	0.139	0.127	0.176	0.171	0.819	0.083	0.359	0.269	0.101
50012	DN-23	0.135	0.209	0.201	0.128	0.122	0.168	0.195 †	0.845	0.0884	0.369	0.28	0.105
50014	DE-23	0.14	0.214	0.208	0.132	0.129	0.177	0.189	0.824	0.0847	0.366	0.271	0.101
50017	DE-23	0.144	0.203	0.198	0.138	0.119	0.162	0.165	0.786	0.082	0.349	0.27	0.109
50020	GI-23	0.16 ††	0.22	0.22	0.15 †	0.117	0.157 ††	0.184	0.724	0.09 †	0.4 ††	0.29 ††	0.11
50024	GJ-23	0.154	0.226	0.224	0.146	0.135	0.185	0.174	0.773	0.082	0.346	0.254	0.097
50025	GJ-23	0.143	0.201	0.207	0.139	0.132	0.175	0.184	0.754	0.081	0.349	0.258	0.102
50027	DN-23	0.134	0.206	0.201	0.13	0.123	0.176	0.174	0.833	0.0804	0.354	0.262	0.094
50029	AD-23	0.143	0.217	0.212	0.137	0.127	0.175	0.17	0.798	0.0801	0.358	0.263	0.0967
52283	GJ-23	0.14	0.202	0.208	0.133	0.116	0.178	0.175	0.944 ††	0.0797	0.348	0.266	0.103
52384	DE-23	0.11 ††	0.18 ††	0.19	0.1 ††								
52387	DE-11	0.136	0.21	0.203	0.133	0.12	0.17	0.18	0.82	0.088	0.36	0.27	4.62 ††
52491	GI-23	0.131	0.202	0.197	0.126	0.134	0.186	0.184	0.783	0.0836	0.35	0.266	0.0984
52494	GG-23	0.128	0.198	0.198	0.124	0.125	0.174	0.176	0.806	0.078	0.344	0.246	0.093
52495	GI-24	0.134	0.226	0.23	0.139	0.123	0.174	0.214 ††	0.926 ††	0.0836	0.372	0.275	0.102
52508	AE-23					0.13	0.13 ††	0.14 ††	0.77	0.0736	0.349	0.289 ††	0.0983
52565	DN-23	0.138	0.213	0.211	0.133	0.13	0.181	0.189	0.826	0.0813	0.367	0.255	0.098
52610	GG-23	0.119	0.19	0.185	0.117								
52632	DE-11	0.135	0.223	0.215	0.13								
52636	DE-23	0.131	0.196	0.186	0.117	0.123	0.166	0.175	0.798	0.068 ††	0.293 ††	0.216 ††	0.0772 ††

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Manganese (mg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	DE-23	20.9	208	26.9	12.1	48.9	18.2	38	144	2120 ††	152	296	14.1
8888	DE-23	19	205	25.1		48.4	17.6	38.5	144	2090 ††	154	316	13.9
10156	GI-23	20.3	198	26.4	12.5	27.3 ††	19.3	39.6	137	1690	137	263	13
10173	DN-24	17.7	195	25.2	10.4	52.1	19.1	42	150	1810	146	281	13.5
11079	DE-23									1740	150	296	14.5
20204	GJ-23	19.7	167 ††	24	12.2	19.6 ††	32.1 ††	37.4	106 ††	2100 ††	114 ††	272	14.7
21088	DE-23	17	185	23	10	41	15 ††	31	145	1730	134	335 ††	11 ††
21100	DE-24	21.2	213	26.6	12.7	58.6	21.7 ††	44.1	156	1760	130	268	14.7
21178	DE-23	18	180	24	11	53	19	38	140	1790	143	279	13.1
21190	AD-13	15.8 ††	197	26.2	11.1	80.1 ††	17.9	33.6	145	1390 ††	132	260	13.4
21229	GI-23	20.3	194	25.9	12.4	50.6	18.1	37.8	137	1790	147	293	14
21230	DE-23	18.5	194	24.2	10.2	42	14.7 ††	32.3	115 ††	1720	136	267	13.3
21232	DE-23	19.7	200	25.3	11.4	44.7	17	35.6	135	2090 ††	152	295	13.6
21234	GH-09	16.1 †	204	23.7	10.4	42.9	15.1 ††	37.6	137	170 ††	157	283	11.9
50004	DE-23	18.8	204	25.4	12.5	49.3	18	38.4	131	1830	139	282	14
50005	GJ-23	20.7	229 ††	25.2	8.89 ††	55.9	16.9	40.4	163 ††	1780	144	282	15.4
50008	GJ-23	19.5	201	25.2	11.5	51.5	18.4	40.2	146	1950	152	295	14.2
50011	DE-23	20.7	207	27.3	12.4	50.7	18	38	144	1740	149	292	14.9
50012	DN-23	20.3	198	25.9	11.8	50.3	17.8	42.3	155	2050 †	160	316	15.5
50014	DE-23	20.3	207	26.3	12	52	18.3	43	149	2000 †	156	302	14
50017	DE-23	20.3	191	24.2	11.8	52.7	19.2	40.9	156	2000 †	155	297	15.8
50020	GI-23	31.4 ††	208	25.1	12.2	45.3	15.9 †	38.6	132	2010 †	168 ††	314	16.3
50024	GJ-23	21.7	212	27	12.6	50.7	18.1	36.9	141	1780	146	279	13.7
50025	GJ-13	20.8	190	25.8	12.5	53.1	18	40.3	135	1750	143	275	15.6
50027	DN-23	18.6	189	24.5	11.2	47.4	17.6	38.2	146	1850	150	288	13.8
50029	AD-23	20.7	210	25.5	12	52.1	18.7	37	138	2020 †	148	307	15.3
52283	GJ-23	20.4	190	25.8	11.7	44.6	18.1	39.5	131	1800	147	287	15
52384	DE-23	21.8	203	27.5	12.5								
52387	DE-11	20.1	187	24	11.6	43.1	16.3 †	34.7	131	1810	140	277	12.3
52491	GI-23	18.8	191	24.1	11.1	48.6	17.2	44.2	165 ††	1810	141	278	13.3
52494	GG-23	17.6	182	23.7	10.7	48.1	17.6	38	140	1710	137	258	12.2
52495	GI-24	18.2	196	25.1	11.1	50.8	18.4	42.9	156	1940	156	296	14.4
52508	AE-23					40.1	16.7	7.68 ††	128	662 ††	144	162 ††	14.3
52528	GK-09									1730	147	264	5.62 ††
52565	DN-23	17.5	196	24.6	10.3	45.1	15.6 †	35.9	131	1710	141	270	11.5 ††
52610	DE-24	18	190	26	11								

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Manganese (mg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
52632	DE-11	10.9 ††	196	15.3 ††	7.56 ††								
52636	DE-23	18	180	22.9	10.2	44.2	16.1 †	35.5	134	1430 ††	108 ††	201 ††	10.1 ††

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Molybdenum (µg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	DE-24	892	21.3	537	1120	1060	404	1080	269	250	124	233	833
8888	DE-24	870		550	1100	1070	140 ††	1110	360	284	156 ††	276	872
10173	DN-24	873	22.7	566	1170	1130	427	1190	310	252	123	259	887
11079	DE-23									290 ††	250 ††	340 ††	985 ††
20204	GJ-23	960 ††	189 ††	556	965 ††	968	505 ††	1050	373 ††	142 ††	147 ††	266	824
21088	DE-23	831	1.7 ††	504	1040	968	365	928	243	258	121	282	715
21100	DE-24	814	38.3 ††	552	1320 ††	1220	406	1360 ††	367 ††	278	99 ††	261	863
21178	DE-24	890	22	560	1140	1100	360	1100	270	265	126	268	893
21229	GI-24	848	17	550	1220	1120	402	1100	270	246	116	251	814
21230	DE-24	724 ††	15.9	446 ††	925 ††	1060	386	1100	273	282	129	246	901
50004	DE-24	865	38	531	1160	1080	419	1200	325	150 ††	46.3 ††	156 ††	751
50005	GJ-23	781	47.1 ††	528	1070	1160	455	1220	349	262	129	261	1160 ††
50011	DE-24	840	23.6	558	1130	1050	382	1110	301	259	127	248	826
50012	DN-24	912	18	532	1110	1020	371	1060	258	238	120	236	810
50014	DE-24	900	27.3	530	1110	1140	397	1100	263	250	127	243	903
50020	GI-23	1200 ††	512 ††	895 ††	1870 ††					2000 ††			
50024	GJ-24	928	22.2	580	1190	1360 ††	483 ††	1410 ††	357	364 ††	162 ††	327 ††	824
50027	DN-23	824	10	533	1060	1090	464	938	88 ††				
50027	DN-24									247	121	252	802
50029	AD-23	950	202 ††	393 ††	1210	1130	497 ††	1130	160 ††	258	114	234	1100 ††
52491	GI-23	1150 ††	297 ††	518	1110								
52491	GI-24					1230	434	1200	312	234	106 ††	230	797
52495	GI-24	848	18.2	543	1120	1140	421	1160	282	260	123	259	915
52508	AE-23					50 ††	64 ††	32 ††	11 ††				
52565	DN-24	720 ††	50 ††	790 ††	940 ††	920 ††	335	960	250	248	118	207	717
52610	DE-24	775	15	510	1000								
52636	DE-23	1600 ††	545 ††	1670 ††	922 ††	617 ††	473 ††	638 ††	236	250	155 ††	208	1650 ††

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Nitrogen (%w/w)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	CA-37	1.66	3.16	0.852	4.38	1.66	2.59	2.68	4.18	1.02	2.44	3.35	1.53
8888	CA-37	1.58	3.14	0.803	4.35	1.64	2.72	2.56	4.08	1.08	2.42	3.32	1.48
10156	CA-37					1.61	2.53 †	2.55	4	0.937	2.35	3.22	1.42
10173	CA-37	1.61	3.09	0.871	4.13					1.09	2.62	3.39	1.64
10181	CA-37	1.71	3.28	0.907	4.52	1.81	2.82	2.83	4.26	1.08	2.52	3.43	1.57
10181	GF-31	2.12 ††	2.26 ††	0.919	3.58 ††	1.67	2.65	2.64	4.04	0.956	2.33	3.12	1.46
20204	CA-37	1.58	3.15	0.85	4.06	1.65	2.6	2.62	4.11	1.01	2.41	3.33	1.49
21088	CA-37	1.5	2.9 ††	0.8	4	1.6	2.5 †	2.5	3.9 †	0.9 ††	2.3	3.1	1.4
21100	CA-37	1.51	3.02	0.79	4.12	1.77	2.74	2.91	4.28	1.04	2.52	3.43	1.57
21190	GE-38	1.82 ††	2.94 †	0.89	4.06	1.62	2.37 ††	2.64	4.11	0.947	2.22 ††	3.22	1.52
21229	GE-31	1.72	3.19	0.89	4.26	1.81	2.73	2.64	4.2	1.01	2.38	3.21	1.45
21229	CA-37	1.68	3.15	0.87	4.16	1.77	2.71	2.77	4.18	1.01	2.35	3.2	1.46
21230	CA-37	1.67	3.18	0.786	4.4	1.47 ††	2.33 ††	2.44	3.67 ††	1	2.46	3.35	1.51
21232	CA-37	1.58	2.96	0.846	4.26	1.67	2.57	2.53	3.94	1.03	2.42	3.33	1.46
21234	GE-32	1.5	2.92 †	0.84	3.92	1.54	2.35 ††	2.23 †	3.59 ††	0.945	2.24 ††	3.06	1.4
50004	CA-37	1.61	3.09	0.9	4.28	1.67	2.68	2.71	4.21	0.981	2.39	3.21	1.48
50005	CA-37	1.64	3.27	0.846	4.43	1.7	2.72	2.71	4.26	1.02	2.48	3.37	1.54
50008	CA-27	1.62	3.15	0.834	4.36	1.76	2.76	2.88	4.27	1.05	2.5	3.37	1.57
50011	CA-37	1.63	3.22	0.878	4.36	1.67	2.7	2.72	4.41	1.05	2.52	3.43	1.54
50012	CA-37	1.64	3.08	0.776	4.08	1.75	2.78	2.93	4.38	1	2.48	3.48	1.54
50014	CA-37	1.64	3.18	0.83	4.46	1.83 †	2.84	2.93	4.34	1.08	2.54	3.44	1.6
50017	CA-37	1.77 ††	3.35	0.865	4.79 ††	1.54	2.46 ††	2.55	3.98	0.939	2.52	3.26	1.45
50020	CA-37	1.68	3.21	0.845	4.4	1.71	2.76	2.87	4.25	1.02	2.46	3.34	1.54
50024	CA-37	1.67	3.23	0.91	4.39	1.68	2.67	2.66	4.16	1.04	2.52	3.42	1.43
50027	CA-37	1.58	3.16	0.87	4.24	1.67	2.7	2.69	4.33	1.11	2.47	3.33	1.39
50029	CA-37	1.6	3.21	0.84	4.32	1.68	2.63	2.63	4.15	1	2.42	3.31	1.49
52283	CA-37	1.65	2.94 †	0.881	4.43	2.11 ††	2.71	2.8	4.14	1.04	2.44	3.33	1.51
52384	CA-37	1.56	3.04	0.81	4.06								
52387	CA-37	1.62	3.53 ††	1.04 ††	4.57	1.46 ††	2.17 ††	1.93 ††	2.91 ††	1.39 ††	2.28 †	3.06	1.6
52491	CA-37	1.55	3.08	0.825	4.16	1.74	2.82	2.93	4.33	1.04	2.48	3.52	1.56
52494	CA-37	1.62	3.11	0.83	4.26	1.72	2.74	2.79	4.27	0.98	2.41	3.24	1.47
52495	CA-37	1.66	3.14	0.876	4.28	1.72	2.7	2.81	4.23	1.04	2.52	3.42	1.55
52508	GE-38					1.64	2.65	2.52	3.8 †	0.97	2.36	3.29	1.53
52543	CA-37									0.95	2.34	3.24	1.42
52565	CA-37	1.5	2.97	0.806	4.07	1.7	2.7	2.6	4.1	1.07	2.45	3.27	1.53
52632	CA-37	1.77 ††	3.29	1.06 ††	4.41								
52636	CA-37	1.64	3.1	0.852	4.16	1.55	2.75	2.47	4.04	1.05	2.49	3.23	1.55

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Nitrate Nitrogen (mg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	**ASP 2002-2**	**ASP 2002-3**	**ASP 2002-4**	**ASP 2005-1**	**ASP 2005-2**	**ASP 2005-3**	**ASP 2005-4**	**ASP 2008-1**	**ASP 2008-2**	**ASP 2008-3**	**ASP 2008-4**
22	BA-31	49.7 ††	478	13.9 ††	0.001	0.001	42	6830	1070	0.001	0.001	3.92	0.001
10173	BB-31	16.9 ††	433	12 †	16.1 ††	35.9 ††	83.3 ††	6060	873 †	4.92	0.0001	8	9.06 †
20204	BB-30	2.29	20 ††	5.2	4	1	54.5	6220	138 ††	40 ††	35.4 ††	14.2	26 ††
21088	BB-31	1	431	1	1.8		45	4580 ††	962	0.2	1.2	4.8	2.5
21100	BB-31	5.35	416	11.2 †	6	3.73	5.41 ††	11400 ††	9.58 ††	9.72	11.7 †	20.9	4.64
21178	BB-31	0.9	430	3.3	3.8	0.5	0.5 ††	6000	990				
21229	BB-31	0.32	436	3.1	1.93	2.69	55.4	7190 †	1090	6.09	10.7 †	41.9 ††	22.7 ††
21232	BB-31	4.85	427	4.73	5.7	4.9	55.4	6510	966	3.61	4.44	15.1	3.55
50005	BA-30	0.932	737 ††	4.21	3.27	5.04	33.3	6240	468 ††	2.96	4.93	12.7	2.01
50011	BB-31	2.47	453	5.92	2.98	1.28	42.1	6070	1030	6.6	4.01	19.4	3.18
50012	BB-31	0.716	421	3.7	1.34	0.62	47.4	6180	901	1.56	2.99	13.9	0.247
50017	BB-31	5.21	156 ††	4.93	7.26								
50020	BA-31	50 ††	462	50 ††	50 ††			6010	643 ††		50 ††		
50025	BB-31	37 ††	550 ††	40 ††	38 ††	24 ††	75 ††	7750 ††	1150	275 ††	256 ††	235 ††	300 ††
50027	BB-31	2	470	7	5	2	47	6710	1040	1	4	17	4
50029	BB-31	2.28	439	3.99	7.5	4.65	52.8	6530	1040	1.7	1.41	11.5	0.5
52494	BA-31	1.17	385	4.83	5.44	1.09	52.5	6210	1020	3.57	3.41	28.4 †	0.775
52565	BA-31	20 ††	382	20 ††	20 ††	50 ††	45.1	5040 ††	1070	3.4	5.2	17.1	2.6
52632	BB-31	11.5 ††	526 †	26.9 ††	10.7								

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Phosphorus (%w/w)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	DE-23	0.373	0.124	0.181	0.34	0.381	0.467	0.706	0.384	0.086	0.151	0.262	0.331
8888	DE-23	0.337	0.118	0.168	0.311	0.387	0.472	0.691	0.375	0.088	0.151	0.263	0.325
10156	GI-23	0.317	0.118	0.168	0.315	0.354	0.43 †	0.628	0.364	0.081	0.136 †	0.234 †	0.286
10173	DN-24	0.313	0.124	0.17	0.302	0.409	0.495	0.723	0.41	0.085	0.153	0.262	0.326
10181	GF-31	0.41 ††	0.163 ††	0.052 ††	0.582 ††	0.413	0.482	0.716	0.394	0.0875	0.145	0.254	0.323
11079	DE-23									1.07 ††	1.71 ††	2.72 ††	3.21 ††
20204	GJ-23	0.335	0.122	0.165	0.295	0.371	0.456	0.66	0.374	0.079 †	0.144	0.256	0.315
21088	DE-23	0.301	0.098 ††	0.146 ††	0.268 †	0.286 ††	0.365 ††	0.528 ††	0.376	0.078 †	0.117 ††	0.282	0.258 ††
21100	DE-24	0.35	0.129	0.178	0.327	0.42	0.535 ††	0.808 †	0.417	0.0848	0.136 †	0.25	0.338
21178	DE-23	0.31	0.11	0.15 †	0.29	0.39	0.47	0.68	0.36	0.0847	0.147	0.252	0.305
21190	GE-30	0.375	0.126	0.175	0.336	0.447 ††	0.525 ††	0.796 †	0.429 †	0.0768 ††	0.149	0.29 †	0.375 ††
21229	GI-23	0.346	0.125	0.173	0.325	0.385	0.47	0.69	0.38	0.0859	0.148	0.256	0.3
21230	DE-23	0.337	0.116	0.164	0.305	0.26 ††	0.307 ††	0.459 ††	0.241 ††	0.0673 ††	0.105 ††	0.189 ††	0.246 ††
21232	DE-23	0.357	0.121	0.168	0.315	0.347	0.425 †	0.612 †	0.348	0.0858	0.151	0.261	0.315
21234	GE-30	0.98 ††	0.23 ††	0.323 ††	0.637 ††	0.2 ††	0.311 ††	0.452 ††	0.248 ††	0.162 ††	0.256 ††	0.489 ††	0.594 ††
50004	DE-23	0.352	0.129	0.186	0.328	0.345	0.432	0.712	0.402	0.085	0.143	0.251	0.306
50005	GJ-23	0.34	0.117	0.169	0.312	0.383	0.459	0.686	0.38	0.0853	0.143	0.261	0.315
50008	GJ-23	0.361	0.123	0.17	0.325	0.391	0.466	0.711	0.387	0.087	0.147	0.252	0.314
50011	DE-23	0.365	0.126	0.177	0.337	0.39	0.466	0.65	0.378	0.088	0.151	0.263	0.324
50012	DN-23	0.385	0.127	0.177	0.335	0.387	0.449	0.748	0.405	0.097 ††	0.168 ††	0.288 †	0.356
50014	DE-23	0.359	0.122	0.17	0.323	0.411	0.488	0.747	0.39	0.0917 †	0.156	0.271	0.345
50017	DE-23	0.363	0.116	0.161	0.331	0.352	0.42 †	0.641	0.366	0.083	0.139	0.253	0.323
50020	GI-23	0.395	0.135	0.19 †	0.345	0.346	0.405 ††	0.675	0.391	0.095 ††	0.165 ††	0.28	0.355
50024	GJ-23	0.361	0.126	0.177	0.321	0.384	0.471	0.654	0.372	0.085	0.149	0.25	0.314
50025	GJ-23	0.382	0.139 ††	0.229 ††	0.377 ††	0.395	0.459	0.77	0.41	0.087	0.15	0.26	0.308
50027	DN-23	0.335	0.122	0.17	0.312	0.366	0.462	0.705	0.391	0.086	0.148	0.254	0.29
50029	AD-23	0.377	0.128	0.185	0.344	0.408	0.5	0.717	0.383	0.0836	0.152	0.267	0.329
52283	GJ-23	0.348	0.118	0.172	0.313	0.387	0.47	0.702	0.394	0.085	0.148	0.261	0.331
52384	DE-23	0.33	0.11	0.16	0.29								
52387	DE-30	0.362	0.123	0.171	0.345	0.368	0.428 †	0.57 †	0.346	0.08	0.13 ††	0.25	0.29
52491	GI-23	0.341	0.12	0.169	0.311	0.397	0.483	0.719	0.386	0.089	0.145	0.265	0.323
52494	GG-23	0.322	0.116	0.165	0.297	0.385	0.469	0.688	0.387	0.087	0.148	0.248	0.303
52495	GI-24	0.336	0.119	0.167	0.31	0.367	0.454	0.787	0.444 ††	0.0836	0.148	0.261	0.317
52508	AE-30					0.41	0.39 ††	0.51 ††	0.48 ††	0.0769 ††	0.155	0.283	0.283
52565	DN-23	0.347	0.132	0.177	0.342	0.38	0.484	0.804 †	0.411	0.0967 ††	0.165 ††	0.278	0.345
52610	GG-23	0.325	0.116	0.163	0.303								
52632	DE-30	0.309	0.097 ††	0.21 ††	0.261 ††								
52636	DE-23	0.325	0.118	0.162	0.289	0.379	0.464	0.704	0.403	0.066 ††	0.115 ††	0.197 ††	0.228 ††

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Potassium (%w/w)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	DE-23	0.27	2.29	1.79	1.13	0.372	0.858	8.17	6.22	0.962	1.01	1.43	0.443
8888	DE-23	0.237	2.06	1.56	0.998	0.381	0.847	8.05	5.89	0.945	0.994	1.4	0.42
10156	GI-23	0.261	1.99	1.57	1.05	0.379	0.815	7.73	6.03	0.849	0.897	1.29	0.395
10173	DN-24	0.236	2.18	1.59	0.992	0.356	0.804	7.53	5.68	0.913	0.98	1.4	0.438
10181	GF-23	0.409 ††	1.87	0.548 ††	2.12 ††	0.418	0.918	8.75	6.52	0.997	1.03	1.46	0.435
11079	DE-23									5.76 ††	6.22 ††	7.79 ††	3.02 ††
20204	GJ-23	0.229	1.97	1.52	0.9	0.28 ††	0.77	7.46	5.81	0.984	1.07	1.4	0.402
21088	DE-23	0.402 ††	1.94	1.54	1.05	0.335	0.757	6.14 †	5.26	0.87	0.858	1.6 †	0.408
21100	DE-24	0.275	2.44 ††	1.83 ††	1.26 ††	0.468 ††	1.07 ††	10.1 ††	7.01 ††	0.823 †	0.815	1.35	0.442
21178	DE-23	0.23	2.04	1.51	0.98	0.36	0.82	7.4	5.4	0.864	0.932	1.32	0.39
21190	GE-09	0.292 ††	2.45 ††	1.98 ††	1.12	0.275 ††	0.748	8.47	6.26	0.74 ††	0.847	1.23	0.309 ††
21229	GI-23	0.238	2.17	1.67	1.07	0.374	0.839	7.77	5.77	0.926	0.972	1.38	0.422
21230	DE-23	0.235	2.02	1.53	0.982	0.158 ††	0.421 ††	6.38	3.84 ††	0.752 ††	0.75 ††	0.973 ††	0.204 ††
21232	DE-23	0.215	2.13	1.55	0.97	0.331	0.767	6.67	5.16	0.958	1.05	1.18	0.412
21234	GH-20	0.373 ††	2.09	1.64	1.15	0.417	0.93	6.72	5.19	1.07 †	1.1	1.53	0.547 ††
50004	DE-23	0.248	2.23	1.7	1.09	0.367	0.82	8.61	6.55	0.904	0.912	1.31	0.401
50005	GJ-23	0.242	2.16	1.62	0.969	0.352	0.787	7.87	6.05	0.931	0.984	1.38	0.541 ††
50008	GJ-23	0.264	2.21	1.63	1.06	0.389	0.861	8.52	6.12	0.936	0.952	1.32	0.417
50011	DE-23	0.26	2.26	1.68	1.1	0.383	0.834	7.37	5.9	0.931	1	1.41	0.435
50012	DN-23	0.244	1.96	1.45	0.955	0.313 †	0.769	7.01	5.23	0.818 †	0.872	1.24	0.391
50014	DE-23	0.235	2.13	1.61	1.03	0.366	0.811	8.02	5.83	0.932	0.977	1.39	0.421
50017	DE-23	0.254	2.14	1.6	1.38 ††	0.349	0.741	6.15 †	5.08	0.837	0.856	1.24	0.384
50020	GI-23	0.24	1.98	1.5	1.01	0.313 †	0.681	7.46	5.96	0.97	1.05	1.45	0.45
50024	GJ-23	0.257	2.21	1.66	1.07	0.358	0.81	7.6	5.8	0.905	0.964	1.31	0.393
50025	GJ-23	0.257	2.11	1.66	1.08	0.407	0.82	4.5 ††	3.95 ††	0.91	0.952	1.34	0.428
50027	DN-23	0.247	2.02	1.6	1.01	0.37	0.838	7.6	5.82	0.928	0.972	1.38	0.416
50029	AD-23	0.175 ††	2.06	1.52	0.886	0.37	0.76	7.37	5.62	0.901	0.946	1.36	0.414
52283	GJ-23	0.255	2.1	1.62	1.05	0.368	0.851	7.84	6.16	0.936	0.978	1.4	0.455
52384	DE-23	0.28	1.99	1.53	0.98								
52387	DE-09	0.267	2.45 ††	1.64	1.04	0.339	0.784	7.53	5.5	0.74 ††	0.78 †	1.12 ††	0.37
52491	GI-23	0.242	2.09	1.59	1.01	0.381	0.857	8	5.86	0.936	0.96	1.39	0.426
52494	GG-23	0.236	2.05	1.59	1	0.378	0.849	7.78	5.9	0.907	0.956	1.3	0.398
52495	GI-24	0.245	2.18	1.76	1.1	0.387	0.898	8.22	6.09	0.989	1.04	1.45	0.451
52508	AE-23					0.31 †	0.55 ††	4.35 ††	4.35 ††	0.629 ††	0.697 ††	1.49	0.545 ††
52528	GJ-20									1	0.91	1.41	0.28 ††

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Potassium (%w/w)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	**ASP 2002-2**	**ASP 2002-3**	**ASP 2002-4**	**ASP 2005-1**	**ASP 2005-2**	**ASP 2005-3**	**ASP 2005-4**	**ASP 2008-1**	**ASP 2008-2**	**ASP 2008-3**	**ASP 2008-4**
52565	DN-23	0.246	2.09	1.59	1.02	0.346	0.735	7.22	5.42	0.789 †	0.813	1.14 ††	0.367
52610	GG-23	0.219	1.8 ††	1.36 †	0.891								
52632	DE-11	0.23	2.12	1.7	1.04								
52636	DE-23	0.211	1.82 ††	1.3 ††	0.835 ††	0.405	0.738	7.31	5.79	0.757 †	0.79 †	1.1 ††	0.33 ††

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Selenium (µg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
	DE-24	119	41.7	72.6	42.9	138	46.6	30	19.2	38.3	92.4	11.8	1020
8888	DE-24	130	40	80	50	150	50	40	30	60.8	127	51.2	1100
10173	DN-24	123	27.5	66.4	37.3	141	51.5	15.3	6.1	26.2	86.4	10.1	932
20204	GJ-23	116	313 ††	338 ††	1070 ††	170	70	60	50	554 ††	15 ††	34.6	155 ††
21088	DE-23	220 ††	1 ††	130 ††	190 ††					1.54 ††	0.8 ††	0.7	0.88 ††
21100	DE-24	196 ††	120 ††	112 ††	158 ††	220 ††	104 ††	21.1	111	41.3	99.1	25.9	1170
21178	DE-24	126	42	77	46	170	62	44	31	55.6	119	31.6	1130
21229	GI-24	128	61.5	89.5	59.4	159	54.8	148 ††	66.1	47.4	98.7	43.4	895
21230	DE-24	99.3	45.5	63.3	39.1	162	59.4	205 ††	107	62.9	111	39.8	937
50004	DE-24	74.8 ††	47.2	81.5	49.7	153	37	119 ††	97.2	53.3	102	52.9	564 ††
50005	GJ-23	146	220 ††	80.7	87.9 ††	67.7 ††	27.1	47.4	94.7	38.2	94.7	38.1	934
50011	DE-24	152	52.5	96.5	56.7	163	59.1	41.6	51.1	43.9	111	24.3	1050
50012	DN-24	144	60	88	50	141	51	62	45	35	95	15	965
50014	DE-24	150	71.7	90	50.1	193	62.7	42.1	37.6	36.5	90	15	967
50020	GI-23	3150 ††	2140 ††	6040 ††	1730 ††								5000 ††
50024	GJ-24	134	110 ††	89	44	168	73	73	133 ††	173 ††	133	102 ††	953
50027	DN-24									86 ††	111	32	963
52491	GI-24					208 ††	107 ††	10	4.5	14.7	71.8	5	886
52495	GI-24	137	41.2	81.9	47.5	167	69.3	45.5	24.8	35.1	91.1	12.6	1050
52565	DN-24	350 ††	220 ††	340 ††	200 ††	100 ††	40	50	40	147 ††	52 ††	178 ††	818

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Silicon (%w/w) – Not Certified											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
21088	DE-23	0.006	0.02	0.117	0.002	0.014		0.006	0.043	0.064	0.04	0.021	0.009
21100	DE-24	0.0748 †	0.060 ††	0.147	0.068 ††	0.0525 ††	0.038 ††	0.0268 ††	0.0389	0.128	0.055	0.0418	0.0546 ††
21178	DE-23	0.006	0.015	0.024	0.002	0.0034	0.000	0.0036	0.015				
21229	ZZ-23									0.366 ††	0.316 ††	0.182 ††	0.174 ††
50004	DE-23	0.015 †	0.045 †	0.124	0.002	0.025	0.001	0.009	0.061	0.083	0.084	0.019	0.008
50005	DE-23	0.00803	0.022	0.095	0.001	0.0167	0.001	0.00702	0.0431	0.107	0.0421	0.0145	0.00946
50008	ZZ-23	0.014 †	0.03	1.43 ††	0.004	0.035	0.013 ††	0.032 ††	0.259 ††	0.196	0.17 †	0.035	0.02 †
50012	DN-23					0.0215	0.001	0.00986	0.0653				
50020	GI-23	0.005	0.005	0.01	0.005	0.0014		0.0011		0.003	0.005	0.008	0.004
50024	ZZ-23									0.205	0.19 ††	0.038	0.023 †
52565	DN-23	0.0076	0.021	0.022	0.001	0.012	0.000	0.0048	0.02	0.044	0.028	0.013	0.0077
52636	DE-23	0.00652	0.023	0.193	0.002	0.02	0.001	0.00827	0.0598	0.105	0.053	0.014	0.007

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Sodium (mg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	DE-23	4.21	11	213	187	23.7	3.56	8670	87.5	184	44.2	85.9	307
8888	DE-23			200	160	29	9.7	8640	155 ††	190	40	80	300
10156	GI-23	45.8 ††	48.9 ††	179	168	207 ††	77 ††	1540 ††	113	171	57.7	94.7	271
10173	DN-24	5.52	12.3	191	150	27.2	6.61	11200 ††	105	168	37.4	81.8	288
11079	DE-23									831 ††	295 ††	311 ††	535 ††
20204	GJ-23	31.7 ††	85.9 ††	289 ††	49.5 ††	10 ††	10	9340	10 ††	223 †	18 ††	92	66 ††
21088	DE-23	378 ††	180 ††	342 ††	374 ††	75 ††	52 ††	7950	120	239 ††	50	107 ††	252
21100	DE-24	7.63	11	222	205 †	35.6 †	9.5	11400 ††	92.6	166	37.2	81.7	316
21178	DE-23	8	14	205	170	30	7.9	8300	88	192	45.8	86.5	272
21190	AD-09					31.8	22.9 †	8190	200 ††	207 †	97 ††	135 ††	278
21229	GI-23	6.94	9.03	206	185	24.4	4.68	8760	84.5	185	36.2	88.3	318
21230	DE-23	2.9	33.2 †	296 ††	168	13.6 †	3.09	8730	98.5	122 ††	25.1 †	51.4 ††	123 ††
21232	DE-23	0.0001	0.001 †	0.020 ††	0.016 ††	20	0.001	6720 ††	80	183	40	85	285
50004	DE-23	7.83	18.7	209	177	27.8	9.51	8560	100	180	41.4	86.6	297
50005	GJ-23	11.6	13.4	203	167	28.9	12.3	8510	89.5	181	46.9	87.5	235
50008	GJ-23	35.3 ††	40.2 ††	222	207 ††	51.7 ††	31 ††	9010	118	200	30.4	93.2	305
50011	DE-23	6.5	11.5	207	185	27.3	6	8120	96.7	191	47.3	89	316
50012	DN-23	5	9	174	150	14 †	2.5	9310	131	209 †	47	99	314
50014	DE-23	12	20	207	177	12 †	1	8860	73.3	173	27 †	70 †	290
50017	DE-23	19 †	14.6	189	183	27.7	5.31	9340	116	183	39.7	80.2	259
50020	GI-23	25 ††	25 †	195	181			9140	99.1	188		87.9	319
50024	GJ-23	1.7	7.2	201	173	22.3	2.22	8070	86.6	175	40.2	82.8	272
50025	GJ-23	50 ††	50 ††	234	230 ††	189 ††	107 ††	6500 ††	186 ††	216 †	113 ††	135 ††	306
50027	DN-23	8	11	201	177	27	8.3	8620	93	189	43	87	296
50029	AD-23	15.5	76.8 ††	187	147 †	15.8 †	9.75	8040	176 ††	172	48	92	227
52283	GJ-23	10.1	11.5	215	196	25.4	10.1	8610	64.3	188	39.8	885 ††	260
52387	DE-09	5	5	171	175	99.4 ††	96.8 ††	7340	347 ††	188	134 ††	53.9 ††	239
52491	GI-23	2	10.4	193	168	26.7	4.77	9300	98.2	182	36.8	82.5	298
52494	GG-23	10.7	25.7 †	237	173	38.6 †	16.7	8080	111	257 ††	56.6	83.2	282
52495	GI-24	4.26	11.3	214	180	25.7	4.64	9780	91.7	188	43.4	88.3	312
52508	AE-23					8.6 ††	48.7 ††	7530	134	236 ††	46.3	88.5	271
52565	DN-23	10.9	19.7	179	152	26	5.5	8220	182 ††	184	64.6 †	120 ††	276
52610	GG-23	3.05	8.24	180	151								
52632	DE-11	8.3	31.7 †	223	196								
52636	DE-23	26.8 ††	50.1 ††	228	184	76.2 ††	29 ††	8300	140 †	176	60 †	108 ††	252

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Sulphur (%w/w)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	DE-23	0.151 ††	0.216	0.122	0.181	0.138	0.172	0.273	0.451	0.197	0.254	0.27	0.11
8888	DE-23	0.147 †	0.218	0.121	0.18	0.153	0.189	0.301	0.478	0.215 †	0.27	0.289 ††	0.114
10156	GI-23	0.096 ††	0.107 ††	0.1	0.104 ††	0.08 ††	0.09 ††	0.1 ††	0.12 ††				
10173	DN-24	0.129	0.202	0.112	0.163	0.12	0.15	0.251	0.404	0.188	0.252	0.256	0.104
11079	DE-23									1.69 ††	2.21 ††	2.31 ††	0.926 ††
20204	GJ-23	0.137	0.219	0.118	0.177	0.138	0.172	0.266	0.45	0.187	0.222	0.248	0.1
21088	DE-23	0.131	0.173	0.096 ††	0.145	0.107 †	0.149	0.244	0.44	0.167	0.208 ††	0.279	0.087 †
21100	CA-37	0.156 ††	0.204	0.129 ††	0.178	0.18 ††	0.217 ††	0.298	0.432	0.176	0.238	0.274	0.124 †
21178	DE-23	0.13	0.18	0.1	0.15	0.13	0.16	0.26	0.4	0.179	0.227	0.24	0.101
21229	GI-23	0.139	0.206	0.116	0.172	0.137	0.168	0.276	0.44	0.19	0.238	0.257	0.0997
21230	DE-23	0.133	0.193	0.107	0.16	0.071 ††	0.085 ††	0.145 ††	0.227 ††	0.131 ††	0.163 ††	0.162 ††	0.0662 ††
21232	DE-23	0.14	0.202	0.111	0.164	0.125	0.157	0.242	0.402	0.188	0.247	0.261	0.103
50004	DE-23	0.134	0.21	0.119	0.172	0.131	0.163	0.27	0.419	0.19	0.234	0.253	0.099
50005	GJ-23	0.134	0.194	0.117	0.163	0.141	0.173	0.272	0.442	0.186	0.233	0.257	0.0995
50008	GJ-23	0.148 †	0.212	0.117	0.174	0.144	0.174	0.285	0.453	0.204	0.253	0.261	0.106
50011	DE-23	0.146 †	0.212	0.117	0.176	0.141	0.172	0.262	0.436	0.194	0.247	0.269	0.111
50012	DN-23	0.145 †	0.204	0.113	0.17	0.149	0.183	0.313	0.488	0.206	0.26	0.28	0.114
50014	DE-23	0.153 ††	0.217	0.12	0.18	0.145	0.176	0.285	0.443	0.2	0.251	0.266	0.109
50017	DE-23	0.138	0.192	0.103	0.171	0.124	0.153	0.248	0.412	0.187	0.229	0.255	0.111
50020	GI-23	0.17 ††	0.23	0.13 ††	0.2 ††	0.123	0.147	0.252	0.435	0.215 †	0.275	0.28	0.115
50024	GJ-23	0.131	0.205	0.115	0.169	0.123	0.156	0.248	0.411	0.18	0.232	0.237	0.095
50025	GJ-23	0.135	0.202	0.114	0.168	0.131	0.155	0.272	0.421	0.195	0.242	0.253	0.1
50027	DN-23	0.134	0.206	0.115	0.166	0.126	0.165	0.265	0.453	0.187	0.234	0.257	0.0914
50029	CA-37	0.136	0.189	0.11	0.161	0.142	0.176	0.237	0.385	0.181	0.231	0.244	0.107
52283	GJ-23	0.137	0.126 ††	0.113	0.141 †	0.18 ††	0.169	0.277	0.188 ††	0.189	0.246	0.256	0.127 ††
52384	DE-23	0.12 †	0.2	0.1	0.13 ††								
52491	GI-23	0.133	0.2	0.11	0.158	0.15	0.186	0.309	0.482	0.2	0.243	0.266	0.107
52494	GG-23	0.131	0.194	0.111	0.158	0.137	0.171	0.278	0.447	0.191	0.241	0.25	0.101
52495	GI-24	0.133	0.198	0.109	0.169	0.142	0.176	0.313	0.494	0.203	0.262	0.275	0.109
52565	CA-37	0.132	0.216	0.118	0.172	0.122	0.156	0.263	0.415	0.188	0.239	0.252	0.0943
52610	GG-23	0.123 †	0.18	0.101	0.15								
52632	DE-30	0.118 ††	0.244 ††	0.206 ††	0.251 ††								
52636	DE-23	0.123 †	0.187	0.105	0.159	0.436 ††	0.55 ††	0.394 ††	1.67 ††	0.2	0.255	0.277	0.109

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Zinc (mg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
22	DE-23	23.3 ††	8.03	35.3	30.6	18.3	36.3	20.9	99.9	14.6	30.6	108	14.7
8888	DE-23	20.3	7.7	34.9	27.2	17	33.7	19.7	93.4	14.5	30.2	124	14
10156	GI-23	21.5	11.2 ††	35.1	28.2	20.8	31.6	21.6	85.7	23.6 ††	27.6	91.5	15.3
10173	DN-24	19.2	7.2	31.8	27.7	19.5	40.2 †	23.3	111 ††	11.2 ††	26.5	118	14.6
11079	DE-23									14.8	31.3	118	14.7
20204	GJ-23	21	6.64	33.1	35.2 ††	20.8	35.5	20.8	96.4	13.5	29.8	112	16.1 †
21088	DE-23	19	7	29 †	26	15	32	18	93	13	24 ††	118	12
21100	DE-24	20.5	8.53	35.4	28.7	19	35.7	21.5	102	16.1 ††	31.8	128	14.6
21178	DE-23	20	7.4	31	26	19	38	23	98	13.9	29	111	13.4
21190	AD-13	20.9	7.58	31.8	28.2	20.1	37.2	13.4 ††	105	12.2	27	102	11.7
21229	GI-23	20.7	7.19	33.8	29.2	18.3	36	19.9	96.3	13.6	28	110	13.2
21230	DE-23	20.2	7.23	32	27.1	11.2 ††	21.9 ††	13.6 ††	63.7 ††	10.2 ††	22.1 ††	83 ††	10 ††
21232	DE-23	20.8	7.71	33.1	27.8	16	32.3	18.7	93.3	13.8	29.9	111	12.9
21234	GH-09	19.2	8.04	31.9	26.8	15.8	29.5	18.1	89.8	14.6	29.1	104	14.2
50004	DE-23	20.8	7.53	35.1	28.6	17.8	31.8	18.4	81.3	12.5	27	101	13.1
50005	GJ-23	20	7.93	32.7	31.7	18.1	33.9	20	94.8	14.1	29.1	109	10.6 ††
50008	GJ-23	21.7	154 ††	32.9	28.6	17.1	33.3	19	89.8	14	28.7	110	14.3
50011	DE-23	20.4	7.48	33.6	27.8	17.8	34	19.8	95.5	13.4	28.7	107	13.5
50012	DN-23	20.1	6.8	30.5	26.6	16.8	32.6	21.1	98.7	14.1	30.6	122	14.3
50014	DE-23	20.9	7.57	33.7	28.1	17.2	34	21	97.4	14.4	30.1	117	13.8
50017	DE-23	20.3	7.15	31.4	28.6	18.2	33.6	20.5	99.5	14.6	29.8	119	16.6 ††
50020	GI-23	25.8 ††	8.7	38.5 ††	33.7 ††	15.8	28.9	17.3	94.1	16.1 ††	35.9 ††	121	16.7 ††
50024	GJ-23	22 †	7.97	33.9	29.4	17.9	35.2	19.8	94.7	14	30	107	13.2
50025	GJ-23	24.3 ††	8.85	33.2	31.4	22	37	22.6	81.5	16.4 ††	29.2	99.5	19.8 ††
50027	DN-23	20	7.54	32.6	26.7	16.5	35.6	20.9	101	13.8	29	110	13
50029	AD-23	23.7 ††	8.21	31.9	31.1	19.4	37	19.7	97.7	14.4	30.2	117	14.8
52283	GJ-23	20.6	9.7 ††	33	43.8 ††	21.6	36	20.9	98.4	13.7	29.7	112	14.4
52384	DE-23	23 ††	8.94 †	33	28.6								
52387	DE-09	19.9	7.31	31.4	24.4	14.5	28.7	17.4	83	11.8 ††	24.5 ††	100	9.19 ††
52491	GI-23	19.5	5.27 ††	30.1	26.2	18	34.8	21.7	102	12.5	28.2	111	13.7
52494	GG-23	17.8 ††	6.6	29.8	24	16.4	32.5	19.3	90.3	12.5	26.1	95.2	11.8
52495	GI-24	20.4	7.43	33.7	28	19	37.7	23.1	106	14.6	30.9	115	14.2
52508	AE-23					21.6	28.5	11.5 ††	86.1	12.4	32.4	115	17.3 ††
52528	GK-11									15	24.1 ††	105	13.1
52565	DN-23	22.4 ††	9 †	38.1 ††	31.3	16.9	32.7	20	90.5	13.3	29	102	13.4
52610	DE-24	18 ††	7	31	26								
52632	DE-11	19.8	8.3	36.4	26.5								

Lab. Code #	Method Codes	Plant sample identification and values for 2020: Total Zinc (mg/kg)											
		February 2020 (Round 2)				*May 2020 (Round 5)*				*August 2020 (Round 8)*			
		ASP 2002-1	ASP 2002-2	ASP 2002-3	ASP 2002-4	ASP 2005-1	ASP 2005-2	ASP 2005-3	ASP 2005-4	ASP 2008-1	ASP 2008-2	ASP 2008-3	ASP 2008-4
52636	DE-23	19.2	4.89 ††	33.7	26.5	16.3	32.3	19.7	90.8	15.7	24.1 ††	88.9	13.2